19th Annual Meeting
of the
Society For Maternal-Fetal Medicine

January 18-23, 1999
San Francisco Hilton
San Francisco, California

In accordance with the wishes of the majority of the SMFM membership, we ask that our members and guests refrain from smoking in the meeting rooms. This conforms to the spirit of our society and the written procedures of our parent organization.
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19th Annual Clinical, Scientific, & Business Meeting

of the

Society For Maternal-Fetal Medicine
January 18-23, 1999

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Dear Colleagues:

The 1999 Annual Meeting of the Society for Maternal-Fetal Medicine marks the 22nd anniversary of the society formerly known as the Society of Perinatal Obstetricians. There were 1055 abstracts submitted for consideration this year: 76 were selected for oral presentation and 575 for poster presentation. The quality of the abstracts continues to be superb and I am confident that the scientific caliber of this meeting will be extremely high.

Our thanks to everyone who submitted abstracts for this year's meeting. Thanks also to our reviewers. Of the 197 members invited to review abstracts, 185 accepted the task. In particular I want to thank the 18 senior reviewers who evaluated the top 20% of abstracts and returned them in a very few days.

Last year Dr. Jim Martin obtained CME credit for our oral sessions and this year we have obtained credit for our poster sessions as well. A total of 17 CME hours for the scientific sessions and 10 hours for the posters may be obtained. Also, this is the first year we have requested that all abstracts be submitted on diskette in order to facilitate their formatting for the American Journal of Obstetrics and Gynecology.

Once again, the review process was conducted at the Society's office in Washington, D.C. Our Executive Director, Pat Stahr, did a phenomenal job organizing and coordinating this project and we thank her and Jill Reese, Barbara Ohlstein and Nanette Irby for all their hard work. I also thank my staff assistant, Lynne McDonnell, for her assistance in managing the annual meeting project in my office.

My thanks to Dr. Gary Hankins, former SPO president, for asking me to be Program Chair as well as our current president, Dr. Mary D'Alton, for her support and vote of confidence.

I must acknowledge three individuals who have worked very hard this year to put together an outstanding program: Michael Socol, Poster Chair, Haywood Brown, Postgraduate Course Chair, and Isabelle Wilkins, Special Forums Chair. Their assistance was invaluable.

Finally, thanks to the membership of the Society for its continued support and submission of their scientific works, making our annual meeting a successful educational forum for everyone.

Sincerely,

Susan M. Cox, M.D.
1999 General Program Chair
1999 Program Committee

Susan M. Cox, MD
Program Chair

Michael L. Socol, MD
Poster Chair

Haywood L. Brown, MD
Postgraduate Course Chair

J. Peter VanDorsten, MD
Fundraising Chair

Isabelle A. Wilkins, MD
Coordinator, Scientific Forums

Denise Main, MD
Elliott Main, MD
Thomas Musci, MD
Local Arrangements Committee
Reviewers for 1999 SMFM Abstracts

The Program Chair, on behalf of the Society, is most grateful to the following people who so conscientiously and promptly judged the abstracts for this meeting.

Regular Reviewers

Ifath Abbas - Hoskins, M.D.
Garland D. Anderson, M.D.
Roberto Andres, M.D.
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Michael Y. Dixon, M.D.
Mitchell P. Dombrowski, M.D.
Sharon L. Dooley, M.D.
Donald J. Dudley, M.D.
Thomas Easterling, M.D.
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Nancy L. Eriksen, M.D.
Gary Eglinton, M.D.
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Bernard Gonik, M.D.
Michael F. Greene, M.D.
Robert H. Hayashi, M.D.
Linda J. Heffner, M.D.
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G. Eric Knox, M.D.
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Bruce W. Kovacs, M.D.
John W. Lamsen, M.D.
Chin-Chu Lin, M.D.
Michael K. Lindsay, M.D.
Charles J. Lockwood, M.D.
Lawrence D. Longo, M.D.
Robert P. Lorenz, M.D.
Michael J. Lucas, M.D.
Barbara Luke, M.D.
David A. Luthy, M.D.
Bill Clinton Mahie, M.D.
Everett F. Magann, M.D.
Elliot K. Main, M.D.
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John C. Morrison, M.D.
Eberhard Mueller-Heubach, M.D.
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D. Michael Nelson, M.D.
Roger B. Newman, M.D.
Edward R. Newton, M.D.
Jennifer R. Newby, M.D.
William F. O'Brien, M.D.
Daniel O' Keeffe, M.D.
Julian T. Parer, M.D.
Richard H. Paul, M.D.
Alan Mark Peaceman, M.D.
Thomas C. Peng, M.D.
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E. Albert Reece, M.D.
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ROBERTO ROMERO, MD

VI January 1999

American Journal of Obstetrics and Gynecology
ACKNOWLEDGMENTS

The Society for Maternal-Fetal Medicine extends sincere thanks and appreciation to the following organiza-
tions for their generous support. As per the SMFM’s Board of Directors policy that corporate contribu-
tions no longer go to directly support the Annual Meeting, the funds donated by these organizations will be
used to support such SMFM activities as the Foundation Fellowship Award and the Fellows Retreat.

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19TH ANNUAL MEETING - JANUARY 18-23, 1999
SAN FRANCISCO HILTON & TOWERS
SAN FRANCISCO, CALIFORNIA

PROGRAM

Monday, January 18, 1999
6:00pm-8:00pm
4:00pm-8:00pm

Tuesday, January 19, 1999
7:00am-6:00pm
7:00am-7:00pm
7:00am-8:00am
8:00am-5:00pm
8:00am-Noon
10:00am-10:30am
Noon-1:00pm
1:00pm-5:00pm
3:00pm-3:30pm
4:00pm-7:00pm

Wednesday, January 20, 1999
7:00am-6:00pm
7:00am-7:00pm
7:00am-8:00am
8:00am-3:00pm
8:00am-3:00pm
10:00am-10:30am
Noon-1:00pm
Noon-3:00pm
3:00pm-various

Registration
Speaker Ready Room
East Lounge
Union Square 25
Continental Breakfast
Continental Ballroom 5
Continental Ballroom 1-4

Postgraduate Course I
"Prenatal Diagnosis and Ultrasound"
Course Director: Nancy Chescheir, MD
Continental Ballroom 6-9

Postgraduate Course II
"Alloimmune Disorders in Pregnancy"
Course Director: Kenneth J. Moise, Jr, MD
Continental Ballroom 5
Continental Ballroom 5
Continental Ballroom 6-9

Coffee Break
Lunch
Continental Ballroom 5

Postgraduate Course III
"Ethics in Perinatal Medicine"
Course Director: Robert C. Cefalo, MD
Continental Ballroom 5

Coffee Break
Board of Directors
Continental Ballroom 5
Executive Boardroom

Registration
Speaker Ready Room
East Lounge
Union Square 25
Continental Breakfast
Continental Ballroom 5
Continental Ballroom 1-4

Postgraduate Course IV
"Prematurity"
Course Director: Alan M. Peaceman, MD
Continental Ballroom 6-9

Postgraduate Course V
"Medical Complications of Pregnancy"
Course Director: Sarah J. Kilpatrick, MD
Continental Ballroom 5
Continental Ballroom 5
Executive Boardroom

Scientific Forums
(see page XIII for locations)
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>6:00pm-7:00pm</td>
<td>Program Directors Meeting</td>
<td>Union Square 19 &amp; 20</td>
</tr>
<tr>
<td>6:30pm-8:00pm</td>
<td>Opening Reception</td>
<td>Continental Ballroom 4-6</td>
</tr>
<tr>
<td>7:00am-5:00pm</td>
<td>Registration</td>
<td>East Lounge</td>
</tr>
<tr>
<td>7:00am-7:00pm</td>
<td>Speaker Ready Room</td>
<td>Union Square 25</td>
</tr>
<tr>
<td>7:00am-7:45am</td>
<td>Continental Breakfast</td>
<td>East Lounge/Continental Ball-rooms 1-3 and 7-9</td>
</tr>
<tr>
<td>7:45am-8:00am</td>
<td>Welcome &amp; Announcements</td>
<td>Continental Ballroom 4-6</td>
</tr>
<tr>
<td>8:00am-10:00am</td>
<td>Welcome</td>
<td>Continental Ballroom 4-6</td>
</tr>
<tr>
<td>10:00am-Noon</td>
<td>Oral Plenary Session I</td>
<td>Yosemite &amp; Franciscan Rooms</td>
</tr>
<tr>
<td>12:00-1:00pm</td>
<td>Luncheon Roundtables</td>
<td>(See page XIV)</td>
</tr>
<tr>
<td>1:00pm-3:30pm</td>
<td>Oral Concurrent Session A:</td>
<td>Continental Ballroom 1-4</td>
</tr>
<tr>
<td>3:30pm-5:30pm</td>
<td>Oral Concurrent Session B:</td>
<td>Continental Ballroom 6-9</td>
</tr>
<tr>
<td>5:30pm-6:30pm</td>
<td>Poster Session II &amp; Coffee</td>
<td>Yosemite &amp; Franciscan Rooms</td>
</tr>
<tr>
<td>5:30pm-6:30pm</td>
<td>Annual SMFM Business Meeting</td>
<td>Continental Parlor 1-3</td>
</tr>
<tr>
<td>5:30pm-6:30pm</td>
<td>Associate Members Meeting</td>
<td>Continental Parlor 7-9</td>
</tr>
<tr>
<td>7:00am-5:00pm</td>
<td>Registration</td>
<td>East Lounge</td>
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<tr>
<td>7:00am-7:00pm</td>
<td>Speaker Ready Room</td>
<td>Union Square 25</td>
</tr>
<tr>
<td>7:00am-8:00am</td>
<td>Continental Breakfast</td>
<td>East Lounge/Continental Ball-rooms 1-3 and 7-9</td>
</tr>
</tbody>
</table>
8:00am-10:00am

Oral Plenary Session II
(Fellows’ Plenary Session)
Moderators:
Donald R. Coustan, MD
J. Peter VanDorsten, MD

10:00am-Noon

Poster Session III
& Coffee

12:00-1:00pm

Luncheon Roundtables
Vendor Lunch

12:00-1:00pm

Oral Concurrent
Session C:
Moderators:
James N. Martin, Jr., MD
Daniel F. O’Keeffe, MD

1:00pm-3:30pm

Oral Concurrent
Session D:
Moderators:
Haywood L. Brown, MD
Dale P. Reisner, MD

3:30pm-5:30pm

Poster Session IV
& Coffee

6:30pm-7:30pm

Cocktail Reception

7:30pm-10:00pm

Annual Banquet
& Awards Presentation
Dancing

10:00pm-Midnight

Saturday, January 23, 1999

7:00am-Noon

Registration
Speaker Ready Room
Continental Breakfast

7:00am-8:00am

Concurrent Oral
Session E:
Moderators:
Ronald S. Gibbs, MD
Jay D. Iams, MD

8:00am-10:30am

8:00am-10:30am

Concurrent Oral
Session F:
Moderators:
Fernand Daffos, MD
James E. Ferguson, II, MD
Nancy Chescheir, MD

10:30am-12:30pm

Poster Session V
& Coffee and
Presentation of
Saturday Oral
and Poster Awards

Adjourn
ACCME Accreditation
This activity has been planned and implemented in accordance with the Essentials and Standards of the Accreditation Council for the Continuing Medical Education (ACCME) through the joint sponsorship of the American College of Obstetricians and Gynecologists (ACOG) and the Society for Maternal-Fetal Medicine. ACOG is accredited by the ACCME to provide continuing medical education for physicians.

AMA CME Credit Hours in Category 1 and ACOG Cognate Hours
ACOG designates the 19th Annual Scientific Meeting for up to 17 credit hours in Category 1 of the Physician’s Recognition Award of the American Medical Association and up to 17 cognate hours in Category I (Formal Learning) of the ACOG Program for Continuing Professional Development. Each physician should claim only those hours of credit that he/she actually spent in the educational activity.

ACOG designates the Poster Sessions for up to 10 credit hours in Category 1 of the Physician’s Recognition Award of the American Medical Association and up to 10 cognate hours in Category I (Formal Learning) of the ACOG Program for Continuing Professional Development. Each physician should claim only those hours of credit that he/she actually spent in the educational activity.

ACOG designates the postgraduate course Prenatal Diagnosis and Ultrasound for up to 7 credit hours in Category 1 of the Physician’s Recognition Award of the American Medical Association and up to 7 cognate hours in Category I (Formal Learning) of the ACOG Program for Continuing Professional Development. Each physician should claim only those hours of credit that he/she actually spent in the educational activity.

ACOG designates the postgraduate courses Alloimmune Disorders in Pregnancy and Ethics in Perinatal Medicine for up to 4 credit hours in Category 1 of the Physician’s Recognition Award of the American Medical Association and up to 4 cognate hours in Category I (Formal Learning) of the ACOG Program for Continuing Professional Development. Each physician should claim only those hours of credit that he/she actually spent in the educational activity.

ACOG designates the postgraduate course Prematurity for up to 5 credit hours in Category 1 of the Physician’s Recognition Award of the American Medical Association and up to 5 cognate hours in Category I (Formal Learning) of the ACOG Program for Continuing Professional Development. Each physician should claim only those hours of credit that he/she actually spent in the educational activity.

ACOG designates the postgraduate course Medical Complications of Pregnancy: Clinical Controversies for up to 6 credit hours in Category 1 of the Physician’s Recognition Award of the American Medical Association and up to 6 cognate hours in Category I (Formal Learning) of the ACOG Program for Continuing Professional Development. Each physician should claim only those hours of credit that he/she actually spent in the educational activity.

Learning Objectives
At the conclusion of the postgraduate courses and the annual meeting, the participant will be able to:
- Discuss the relevant science and appropriate clinical application for the topics in maternal-fetal medicine including issues relevant to prematurity, perinatal infectious diseases, hypertensive disorders, diagnostic ultrasound, genetics, prenatal diagnosis, fetal therapy, clinical obstetrics, other major problems of pregnancy, pharmacology, maternal-fetal physiology, and perinatal outcomes based research.
- Identify concepts and therapeutic approaches to aspects of maternal-fetal medicine which have been displaced by newer ones that will immediately impact clinical practice.

Disclosure of Faculty and Industry Relationships
In accordance with ACOG policy, all faculty members have signed a conflict of interest statement in which they have disclosed any significant financial interests or other relationships with industry relative to topics they will discuss at this program. At the beginning of the program, faculty members are expected to disclose any such information to participants. Such disclosure allows you to evaluate better the objectivity of the information presented in lectures.
Please report on your evaluation form any undisclosed conflict of interest you perceive. Thank you.

SMFM POLICY REGARDING AUDIO AND VIDEO RECORDING
As a courtesy to faculty, presenters and registrants, it is the general policy of the Society for Maternal-Fetal Medicine that there shall be no audio/video recording or any type of photographic reproduction of any material presented at an SMFM-sponsored postgraduate course or the annual scientific meeting. [This does not preclude taking pictures of your poster presentation for personal use.]

In special circumstances, a presenter or participant can petition the Program Chair and the SMFM Board of Directors by written request at least 30 days in advance of the meeting to have this policy waived for a specific reason if the presenter(s) is (are) in agreement and if the recording or photography can be arranged without disruption to the other meeting participants.

XII January 1999
American Journal of Obstetrics and Gynecology
SCIENTIFIC FORUMS/SPECIAL FOCUS GROUPS
WEDNESDAY, JANUARY 20, 1999

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<tr>
<th>Group</th>
<th>Time</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Usage in Perinatal Medicine</td>
<td>3:00 - 5:20 pm</td>
<td>Union Square 15</td>
</tr>
<tr>
<td>Critical Care in Perinatal Medicine</td>
<td>3:00 - 6:00 pm</td>
<td>Union Square 4</td>
</tr>
<tr>
<td>Diabetes Mellitus in Pregnancy</td>
<td>3:00 - 6:00 pm</td>
<td>Plaza A</td>
</tr>
<tr>
<td>Genetics</td>
<td>3:00 - TBA</td>
<td>Continental Ballroom 1-4</td>
</tr>
<tr>
<td>Hypertension in Pregnancy</td>
<td>3:00 - 5:00 pm</td>
<td>Continental Ballroom 6-9</td>
</tr>
<tr>
<td>Infectious Diseases in Perinatal Medicine</td>
<td>3:00 - TBA</td>
<td>Union Square 3</td>
</tr>
<tr>
<td>Perinatal Epidemiology and Health Services Research</td>
<td>3:00 - TBA</td>
<td>Union Square 17 &amp; 18</td>
</tr>
<tr>
<td>Preterm Labor</td>
<td>3:00 - TBA</td>
<td>Plaza B</td>
</tr>
<tr>
<td>Ultrasound in Perinatal Medicine</td>
<td>3:00 - TBA</td>
<td>Union Square 14</td>
</tr>
</tbody>
</table>

THURSDAY, JANUARY 21

| Women In Perinatology                           | 7:00 am - 7:45 am| Union Square 22       |
| Special Focus Group Breakfast Meeting           |                |                       |
| Research Support Personnel                      | 11:30 am -1:00 pm| Union Square 13       |
| Special Focus Group Box Lunch Meeting           |                |                       |
| Community Practice Management                   | 6:30 pm - 8:00 pm| Union Square 21       |
| Special Focus Group Meeting                     |                |                       |
| International Society of Perinatal Obstetricians| 6:30 pm - 8:30 pm| Union Square 22       |
| Scientific Forum                                |                |                       |

Other Thursday Special Focus Group Meetings:
Education**
Pro-Life MFM**

**Check with Meeting Registration Desk for specific times and locations.

FRIDAY, JANUARY 22

| International Society of Perinatal Obs.        | 7:00 am - 8:00 am| Union Square 22       |
| Breakfast/Annual Business Meeting              |                |                       |

American Journal of Obstetrics and Gynecology
LUNCHEON ROUNDTABLES

THURSDAY, JANUARY 21 - Noon to 1:00pm

Historical Perspective on Eclampsia
  Jack Pritchard, MD, and F. Gary Cunningham, MD
  Room: Union Square 22

Perinatal Management of Congenital Heart Disease
  Joshua A. Copel, MD
  Room: Union Square 21

Biochemical Markers of Prematurity
  Thomas Garite, MD
  Room: Union Square 19 & 20

Management of the Isoimmunized Gravida
  Kenneth J. Moise, Jr., MD
  Room: Union Square 17 & 18

Antiphospholipid Antibody Syndrome
  Charles J. Lockwood, MD
  Room: Union Square 15 & 16

Limits of Applications for Multiple Biochemical Markers and Ultrasound Screening for Chromosomal Anomalies
  Richard L. Berkowitz, MD
  Room: Union Square 14

FRIDAY, JANUARY 22 - Noon to 1:00pm

Fetal Therapy
  Mark I. Evans, MD
  Room: Union Square 23 & 24

Diabetes: Pre-Pregnancy Counseling
  Steven G. Gabbe, MD
  Room: Union Square 22

Non-Aneuploidy Antenatal Genetic Screening
  Katharine D. Wenstrom, MD
  Room: Union Square 19 & 20

Cervical Length and Preterm Birth Prediction
  Jay D. Iams, MD
  Room: Union Square 17 & 18

Advanced Doppler Techniques
  Dev Maulik, MD
  Room: Union Square 15 & 16

Antibiotics: Do They Have a Place in Prematurity Prevention?
  Robert L. Goldenberg, MD
  Room: Union Square 14
Thursday, January 21, 1999

7:45 a.m. to 10:00 a.m.
Oral Plenary Session I
Continental Ballroom 4-6

Moderators: Mary E. D’Alton, MD, President
Steven L. Clark, MD, Immediate Past President

7:45-8:00
WELCOME AND ANNOUNCEMENTS

8:00-8:15
METRONIDAZOLE DID NOT PREVENT PRETERM BIRTH IN ASYMPTOMATIC WOMEN WITH BACTERIAL VAGINOSIS
Klebanoff MJ, Carey JC, NICHD MFMU Network, Bethesda, MD

8:15-8:30
INTRAAMNIOTIC INFLAMMATION AND THE DEVELOPMENT OF CEREBRAL PALSY AT THREE YEARS OF AGE

8:30-8:45
HUMAN PARTURITION IS ASSOCIATED WITH ENHANCED EXPRESSION AND ACTIVITY OF CYCLOOXYGENASE-2

8:45-9:00
MAINTENANCE ORAL NIFEDIPINE FOR PRETERM LABOR: A PROSPECTIVE, RANDOMIZED CLINICAL TRIAL

9:00-9:15
TRANSDERMAL ADMINISTRATION OF A NITRIC OXIDE DONOR IS NOT ASSOCIATED WITH CHANGES IN MAJOR FETAL CARDIAC AND SYSTEMIC HEMODYNAMIC PARAMETERS

9:15-9:30
A Ca²⁺ CHANNEL INHIBITOR RELEASED FROM FETAL MEMBRANES IS ABNORMAL IN PRETERM LABOR

9:30-9:45
THROMBIN EFFECTS ON ENDOMETRIAL STROMAL CELL LEVELS OF MATRIX METALLOPROTEINASE-1 AND METALLOPROTEINASE-3 MAY PROVIDE A LINK BETWEEN BLEEDING AND RUPTURE OF THE FETAL MEMBRANES

9:45-10:00
LONGITUDINAL CHANGES IN AMINO ACID INSULIN SENSITIVITY DURING PREGNANCY

Klebanoff MJ, Carey JC, NICHD MFMU Network, Bethesda, MD


Carr DB, Spinnato JA, Kernek K, Clark AL, Dept. of Ob/Gyn, Univ. of Washington, Seattle, WA and Univ. of Louisville, Louisville, KY


Carroll EM, Gianopoulos J, Collins PL, Dept. of Ob/Gyn, Loyola Univ. Med Center, Maywood, IL

Lam H, Hamar B, Rosen T, Schatz F, Lockwood C, Dept. of Ob/Gyn, NYU School of Medicine, New York, NY

Catalano P, Huston L, Kalman S, Dept. of Ob/Gyn and Pediatrics, MetroHealth Med. Center, Case Western Reserve Univ., Cleveland, OH

American Journal of Obstetrics and Gynecology
January 1999 XV
Thursday, January 21, 1999

Oral Concurrent Session A
Continental Ballroom 1-4

Medical Complications

Moderators: Valerie M. Parsi, MD
Michael L. Socol, MD

1:00-1:15
9 LEPTIN AND FETAL GROWTH: A NEW PIECE IN THE PUZZLE OF FETAL MACROSOMIA

1:15-1:30
10 ORAL HYPOGLYCEMIC AGENT IS COMPARABLE TO INSULIN IN GDM MANAGEMENT: A RANDOMIZED STUDY

1:30-1:45
11 NICOTINE PATCH THERAPY (NPT) IN PREGNANCY: COMPARISON OF NICOTINE(N) AND COTININE(C) LEVELS OF NON-PREGNANT CONTROLS

1:45-2:00
12 FETAL RAT BRAIN DAMAGE DUE TO MATERNAL SEIZURE ACTIVITY: PREVENTION BY MAGNESIUM SULFATE

2:00-2:15
13 MATERNAL RISK FACTOR PREDICTION OF NICU ADMISSIONS: EVALUATION OF 52,096 WOMEN IN NATIONAL MANAGED CARE PROGRAMS

2:15-2:30
14 THE SAFETY AND EFFICACY OF PROTEASE INHIBITOR THERAPY FOR HIV INFECTION DURING PREGNANCY

2:30-2:45
15 IMMUNOLOGICAL DETERMINANTS OF HIV TRANSMISSION FROM MOTHER TO CHILD: PROTECTIVE ROLE OF CHEMOKINES ASSOCIATED WITH HIV-SPECIFIC T-HELPER RESPONSES

2:45-3:00
16 RAPID TESTING AND ZIDOVUDINE TREATMENT TO PREVENT VERTICAL TRANSMISSION OF HIV IN UNREGISTERED OBSTETRICAL PATIENTS: A COST-EFFECTIVENESS AND COST-BENEFIT ANALYSIS

3:00-3:15
17 IMPACT OF PRENATAL AND INTRAPARTUM ANTIBIOTIC ADMINISTRATION ON ANTIBIOTIC RESISTANT NEONATAL SEPSIS

3:15-3:30
18 PRENATAL DIAGNOSIS OF CONGENITAL TOXOPLASMOSIS: EVALUATION OF DIFFERENT BIOLOGICAL PARAMETERS: A MULTICENTER STUDY

Wewer A, Furman B, Hackmon R, Frazer D, Reece EA, Zvili I, Shani S, Mazor M, Dept. of Ob/Gyn, Clinical Biochemistry and Epidemiology unit, Soroka Medical Center, Faculty of Health Science, Ben-Gurion Univ. of the Negev, Beer Sheva, Israel and Temple Univ., Philadelphia, PA

Louganis O, Conway D, Berkus M, Xenakis EML, Dept. of Ob/Gyn, UTHSCSA, San Antonio, TX


Holak M, Kupsak W, Hota J, Evans J, Dept. of Ob/Gyn, Wayne State Univ. School of Med., Detroit, MI


Steck A, Kramer F, Fassett M, Khoury M, Dept. of Ob/Gyn, Medicine and Pediatrics, Univ. of Southern California School of Med., Los Angeles, CA


Stamm JSA, Rouse DJ, Dept. of Ob/Gyn, Univ. of Alabama at Birmingham, Birmingham, AL

Mercer B, Carr T, Beazley D, Crouse D, Sibai B, Dept. of Ob/Gyn, Univ. of Tennessee, Memphis, TN

Fowlon W, Pino J, Stray-Pederson B, Pollok A, Lappalainen M, Decoster A, Naessens A, Dept. of Ob/Gyn and Microh., Univ. of Brussels, Univ. of Reims, Univ. of Oslo, Univ. of Vienna, Univ. of Helsinki, Univ. of Lille
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<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Presenters</th>
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<tbody>
<tr>
<td>1:00-1:15</td>
<td>19</td>
<td>A ROLE OF THE CELL DEATH FACTOR SYSTEM (FAS/FAS LIGAND) IN SPONTANEOUS RUPTURE OF MEMBRANES</td>
<td>Maymon E, Edwin S, Pacora P, Gomez R, Mazor M, Yoon B, Romero R, Perinatology Research Branch, NICHD/NIH, Bethesda, MD and Dept. of Ob/Gyn, Wayne State Univ./Hutzel Hospital, Detroit, MI</td>
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<td>1:30-1:45</td>
<td>21</td>
<td>VASCULAR REACTIVITY IN THE PERFUSED UTERINE BED OF NONPREGNANT AND PREGNANT RATS</td>
<td>Fuler E, Vedernikov Y, Saade G, Chwalisz K, Garfield R, Dept. of Ob/Gyn, Univ. of Texas Med. Branch, Galveston, TX and Schering AG, Berlin, Germany</td>
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<td>1:45-2:00</td>
<td>22</td>
<td>CHANGES IN CERVICAL COLLAGEN IN GUINEA PIGS DURING GESTATION AS MEASURED IN VIVO WITH LIGHT-INDUCED FLUORESCENCE</td>
<td>Pilkiew C, Shi SQ, MacKay L, Bytantiene E, Saade G, Chwalisz K, Garfield R, Dept. of Ob/Gyn, Univ. of Texas Med. Branch, Galveston, TX and Schering AG, Berlin, Germany</td>
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<td>2:00-2:15</td>
<td>23</td>
<td>A ROLE FOR THE 72 kDa GELATINASE AND ITS INHIBITOR IN HUMAN PARTURITION</td>
<td>Maymon E, Gomez R, Hassan S, Edwin S, Mazor M, Yoon B, Romero R, Perinatology Research Branch, NICHD/NIH, Bethesda, MD and Dept. of Ob/Gyn, Wayne State Univ., Detroit, MI</td>
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<td>2:30-2:45</td>
<td>25</td>
<td>HUMAN CHORIONIC GONADOTROPIN EXHIBITS POTENT TOCOLYSIS OF PRETERM LABOR IN A SMALL ANIMAL MODEL</td>
<td>Kurtzman J, Spinnato J, Goldsmith L, Zimmerman M, Klem M, Rao C, Dept. of Ob/Gyn, Univ. of Louisville, Louisville, KY</td>
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<td>2:45-3:00</td>
<td>26</td>
<td>BLOOD PRESSURE IN iNOS KNOCKOUT MICE DURING PREGNANCY</td>
<td>Saade G, Ali M, Shi SQ, McKay L, Belfort M, Garfield R, Depts. Ob/Gyn, The Univ. of Texas Med. Branch, Galveston, TX and Univ. of Utah, Salt Lake City, UT</td>
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<td>3:00-3:15</td>
<td>27</td>
<td>PREGNANCY-INDUCED PLASMA HYPO-Osmolality: EVIDENCE FOR ACTIVE MATERNAL AND PASSIVE FETAL OSMOTIC RESETTING</td>
<td>EL-Haddad MA, Ross M, Dept. of Ob/Gyn, Harbor-UCLA Med. Center, Torrance, CA</td>
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<td>3:15-3:30</td>
<td>28</td>
<td>THE TUMOR NECROSIS FACTOR AND ITS SOLUBLE RECEPTOR PROFILE IN TERM AND PRETERM PARTURITION</td>
<td>Maymon E, Ghezzi F, Edwin S, Gomez R, Mazor M, Yoon B, Romero R, Perinatology Research Branch, NICHD/NIH, Bethesda, MD and Dept. of Ob/Gyn, Wayne State Univ./Hutzel Hospital, Detroit, MI</td>
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**Friday, January 22, 1999**

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<th>Presenters/Institutions</th>
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<tr>
<td>8:00-8:15</td>
<td>Oral Plenary Session II</td>
<td>Continental Ballroom 4-6</td>
<td>Donald R. Coustan, MD and J. Peter VanDorsten, MD</td>
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<td>8:15-8:30</td>
<td>THE ROLE OF EXTRACELLULAR SUPEROXIDE DISMUTASE (ECOSOD) IN HUMAN PREGNANCY</td>
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<td>8:30-8:45</td>
<td>A PROSPECTIVE RANDOMIZED DOUBLE-BLIND TRIAL OF ORAL NIFEDIPINE AND INTRAVENOUS LABETALOL IN HYPERTENSIVE EMERGENCIES</td>
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<td>8:45-9:00</td>
<td>INTERGENERATIONAL PATERNAL PREDISPOSITION TO PREECLAMPSIA</td>
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<td>9:00-9:15</td>
<td>A RANDOMIZED TRIAL OF CONJUGATED IA GROUP B STREPTOCOCCAL VACCINE IN A RABBIT MODEL OF ASCENDING INFECTION</td>
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<td>9:15-9:30</td>
<td>THROMBIN, A NON-CLASSIC UTEROTONIC AGONIST THAT PRODUCES PHASIC MYOMETRIAL CONTRACTIONS</td>
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<td>9:30-9:45</td>
<td>THE EFFECTS OF REPEATED DOSES OF ANTENATAL CORTICOSTEROIDS ON MATERNAL ADRENAL FUNCTION</td>
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<td>9:45-10:00</td>
<td>NITRIC OXIDE MODULATION OF OVINE FETAL SWALLOWING</td>
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<tr>
<td>1:00-1:15</td>
<td>Oral Concurrent Session C</td>
<td>Continental Ballroom 1-4</td>
<td>James N. Martin, Jr., MD and Daniel F. O’Keeffe, MD</td>
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<td>1:15-1:30</td>
<td>A RANDOMIZED TRIAL OF THE EFFECTS OF EPIDURAL ANALGESIA ON PREGNANCY-INDUCED HYPERTENSION</td>
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<td>1:30-1:45</td>
<td>A NOS3 POLYMORPHISM IS ASSOCIATED WITH PREECLAMPSIA</td>
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**Presenters/Institutions**
- **Boggess K.** Kay H. Crapo J. Herbert W., Oury T. Dept. of Ob/Gyn, Med. and Path., Duke Univ. Medical Center, Durham, NC
- **Vermillion S.** Scardo J. Newman R., Chauhan S. Dept. of Ob/Gyn, Medical Univ. of SC, Charleston, SC
- **Esplin M.** Fraser A. Kerber R. Mineau G., Carrillo J. Vamer M. Dept. of Ob/Gyn, Univ. of Utah School of Med., Salt Lake City, UT
- **Davies J.** Lee S. Eckens J. Woodcock S., McDiff R. Paolelti L. Gibbs R., Dept. of Ob/Gyn, Univ. of Colorado, Denver, CO, and Dept. of Medicine, Channing Laboratory, Boston, MA
- **Elovitz M.** Saunders T. Philippe M., Section of MFM, Dept. of Ob/Gyn, Univ. of Chicago, Chicago, IL
- **McKenna D.** Wittber G. Samuels P., Dept. of Ob/Gyn, The Ohio State Univ., Columbus, OH
- **El-Haddad M.** Nijland M. Ma S. Ross M., Dept. of Ob/Gyn, Harbor-UCLA Med. Center, Torrance, CA
1:45-2:00  40  RANDOMIZED DOUBLE-BLIND HEMODYNAMIC STUDY OF ORAL NIFEDIPINE AND IV LABETALOL IN HYPERTENSIVE URGENCIES OF PREGNANCY
Scardo J, Vermillion S, Newman R, Chauhan S, Brost B, Spartanburg Regional Med. Center, Spartanburg, SC and Medical Univ. of SC, Charleston, SC

2:00-2:15  41  TRANSVAGINAL DOPPLER ULTRASOUND OF THE UTEROPLACENTAL CIRCULATION IN THE EARLY PREDICTION OF PRE-ECLAMPSIA AND FETAL GROWTH RESTRICTION
Thaler I, Amit A, Itskovitz-Eldor J, Dept. of Ob/Gyn, Rambam Medical Center, Haifa, Israel

2:15-2:30  42  THE EFFECT OF SEX STEROID HORMONES ON BLOOD PRESSURE AND FETAL WEIGHTS IN PREGNANT RATS TREATED WITH L-NAME
Shi S-Q, Shi L, Saade G, Chwalisz K, Garfield R, Dept. of Ob/Gyn, The Univ. of Texas Med. Branch, Galveston, TX, and Schering AG, Berlin, Germany

2:30-2:45  43  NEONATAL OUTCOME IN WOMEN WITH SEVERE PRE-ECLAMPSIA OR ECLAMPSIA BETWEEN 24th AND 33rd WEEKS
Widin A, Saade G, Mattar F, Sibai B, Dept. of Ob/Gyn, Univ. of Texas Med. Branch, Galveston, TX and Univ. of Tennessee, Memphis, TN

2:45-3:00  44  PRENATAL ALCOHOL AND WEIGHT REDUCTION: CONTRIBUTION OF GROWTH RESTRICTION AND SHORTENED GESTATION
Sokol R, Martier S, Janisse J, Ager J, Dept. of Ob/Gyn, Wayne State Univ., Detroit, MI

3:00-3:15  45  NEONATAL NUCLEATED RED BLOOD CELL COUNTS OF GROWTH RESTRICTED FETUSES-RELATIONSHIP TO ARTERIAL AND VENOUS DOPPLER STUDIES

3:15-3:30  46  MAIN SPLENIC ARTERY PEAK SYSTOLIC VELOCITY (PSV): A STRONG PREDICTOR OF SEVERE FETAL ANEMIA DUE TO RH-ALLOIMMUNIZATION

Friday, January 22, 1999

1:00 p.m. to 3:30 p.m.

Oral Concurrent Session D

Clinical Obstetrics

Moderators: Haywood L. Brown, MD
Dale P. Reinsen, MD

1:00-1:15  47  IS MECONIUM-STAINED AMNIOTIC FLUID INFECTIOUS MORBIDITY REDUCED BY PROPHYLACTIC AMPCILLIN SULBACTAM?
Adair CD, Lewis D, Weeks J, Vandenbarg T, Bartilleaux S, Philibert L, Burlison S, Dept. of Ob/Gyn, LSUMC, Shreveport, LA

1:15-1:30  48  ADVANCED CERVICAL DILATION AND TOCOLOGY
Amon E, Midkiff C, Shumway J, Holcomb W, Artal R, Winn H, Div. of MFM, St. Louis Univ., St. Louis, MO

1:30-1:45  49  CORRELATION OF BLOOD GAS PARAMETERS WITH NEONATAL MORTALITY AND INDICATORS OF MORBIDITY IN NEWBORNS WITH PATHOLOGIC FETAL ACIDEMIA

1:45-2:00  50  EFFECTIVENESS OF ANTENATAL STEROIDS IN MULTIPLE GESTATION

2:00-2:15  51  DOES SALVAGE CERCLAGE PREVENT PRETERM DELIVERY IN PATIENTS WITH SONOGRAPHIC CERVICAL SHORTENING AND/OR FUNNELING?
CESAREAN DELIVERY DOES NOT DECREASE THE RISK OF INTRAVENTRICULAR HEMORRHAGE IN NEONATES <1500 GM

ORAL NARCOTIC AND NON-NARCOTIC ANALGESIA AFTER CESAREAN SECTION

THE PATHOPHYSIOLOGY OF AMNIOTIC FLUID VOLUME (AFV) IN THE POSTTERM PREGNANCY

Differential expression analysis of genes in laboring myometrial tissue

RATE OF UTERINE RUPTURE DURING A TRIAL OF LABOR IN WOMEN WITH ONE AND TWO PRIOR CESAREAN DELIVERIES

Saturday, January 23, 1999

8:00 a.m. to 10:30 a.m. Oral Concurrent Session E Continental Ballroom 1-4

8:00-8:15 57 THE IMPACT OF DIGITAL CERVICAL EXAMINATION ON EXPECTANTLY MANAGED PRETERM RUPTURED MEMBRANES

8:15-8:30 58 EVIDENCE FOR DYSREGULATION IN "THE DEATH FACTOR RECEPTOR" "FAS" IN PREMATURE LABOR

8:30-8:45 59 PROSPECTIVE EVALUATION OF PATIENTS AT HIGH RISK FOR PRETERM DELIVERY WITH TRANSVAGINAL ULTRASOUND OF THE CERVIX

8:45-9:00 60 FETAL PLASMA INTERLEUKIN-6 IN PRETERM PREMATURE RUPTURE OF MEMBRANES, INTRAAMNIOTIC INFECTION, AND IMPENDING PRETERM DELIVERY

9:00-9:15 61 THE PRETERM PREDICTION STUDY: SEQUENTIAL CERVICAL LENGTH AND FETAL FIBRONECTIN TESTING FOR THE PREDICTION OF SPONTANEOUS PRETERM BIRTH (SPB)

9:15-9:30 62 A NOVEL FORM OF FETAL CARDIAC DYSFUNCTION IN PRETERM PREMATURE RUPTURE OF MEMBRANES

9:30-9:45 63 DO ANTENATAL CORTICOSTEROIDS BENEFIT NEONATES <1000 GRAMS?

Alexander I, NICHD/MFMU Network, Bethesda, MD

Maymon E, Edwin S, Gomez R, Hassan S, Mazor M, Yoon B, Romero R, The Perinatology Research Branch, NICHD/NIH, Bethesda, MD and Dept. of Ob/Gyn, Wayne State Univ/Hutzel Hospital, Detroit, MI


Goldenberg R, NICHD/MFMU Network, Bethesda, MD


O'Sullivan MJ, del Moral M, Claire N, Vanbuskirk S, Bancalari E, Univ. of Miami, Jackson Memorial Hospital, Miami, FL

XX January 1999  American Journal of Obstetrics and Gynecology
9:45-10:00 64 THE PRETERM PREDICTION STUDY: GRANULOCYTE COLONY STIMULATING FACTOR (GCSF) AND SPONTANEOUS PRETERM BIRTH (SPB)  
Goldenberg R, Andrews W, NICHD/ MFMU Network, Bethesda, MD

10:00-10:15 65 PRETERM PREMATURE RUPTURE OF MEMBRANES IS ASSOCIATED WITH DECREASED SONOGRAPHIC CERVICAL LENGTH  
Kurtzman J, Coogan S, Goldsmith L, McDonald M, Spinnato J, Dept. of Ob/Gyn, Univ. of Louisville, Louisville, KY

10:15-10:30 66 INTERNATIONAL COLLABORATION ON MULTIFETAL PREGNANCY REDUCTION (MFPR): DRAMATICALLY IMPROVED OUTCOMES WITH INCREASED EXPERIENCE  

Saturday, January 23, 1999

8:00 a.m. to 10:30 a.m. Oral Concurrent Session F Continental Ballroom 5-6

8:00-8:15 67 THE EFFECT OF GESTATION DATING ERROR ON BIRTH WEIGHT REFERENCE STANDARDS AT TERM  
Gardosi J, Francis A, PRAM, QMC-University Hospital, Nottingham, UK

8:15-8:30 68 PRENATAL EVALUATION & SHUNTING FOR FETAL OBSTRUCTIVE UROPATHY: MANAGEMENT OF NEARLY 100 CASES  
Johnson M, Feldman B, Kasperski S, Qureshi F, Jacques S, Gonzales R, Evans M, Depts. of Ob/Gyn, Molecular Medicine and Genetics, Pathology, and Pediatric Urology, Wayne State Univ., Detroit, MI

8:30-8:45 69 UMBILICAL VEIN BLOOD FLOW IN THE OVINE FETUS: COMPARISON OF DOPPLER AND STEADY STATE TECHNIQUES  

8:45-9:00 70 HYPERGLYCOXYLATED hCG PLUS ULTRASOUND BIOMETRY: A NEW DOWN SYNDROME SCREENING ALGORITHM FOR ADVANCED MATERNAL AGE  
Bahado-Singh R, Oz U, Shahabi S, Rinne K, Adzizian K, Stiller R, Hunter D, Hua C, Copel J, Mahoney M, Cole L, Depts. of Ob/Gyn, Yale School of Med., New Haven, CT, Norwalk Hospital, Norwalk, CT and Bridgeport Hospital, Bridgeport, CT

9:00-9:15 71 PROSPECTIVE EVALUATION OF FREE ßhCG AND DIMERIC INHIBIN A FOR ANEUPLOIDY DETECTION  
Wenstrom K, Owen J, Chu D, Boots L, Dept. of Ob/Gyn, Univ. of Alabama at Birmingham, Birmingham, AL

9:15-9:30 72 SELECTIVE TERMINATION (ST) FOR STRUCTURAL (STR), CHROMOSOMAL (CHR), AND MENDELIAN (MEN) ANOMALIES: INTERNATIONAL EXPERIENCE  

9:30-9:45 73 EFFICACY OF SECOND-TRIMESTER GENETIC SONOGRAPHY IN GUIDING CLINICAL MANAGEMENT OF PATIENTS WITH INCREASED RISK FOR FETAL TRISOMY 21: AN UPDATE  
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<tr>
<td>9:45-10:00</td>
<td>74</td>
<td>OPEN FETAL REPAIR OF MYELOMENINGOCELE IMPROVES NEUROLOGIC OUTCOME IN THE NEONATE</td>
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<tr>
<td>10:00-10:15</td>
<td>75</td>
<td>THE ROLE OF ULTRAFAST T2 WEIGHTED MAGNETIC RESONANCE IMAGING IN THE PRENATAL DIAGNOSIS OF FETAL MALFORMATIONS</td>
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<td>10:15-10:30</td>
<td>76</td>
<td>UTILITY OF MINOR ULTRASOUND FINDINGS IN DETECTING ANEUPLOIDY IN A PRENATAL DIAGNOSTIC CENTER</td>
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**Sohl B., Scioscia A., Moore T., Div. of Perinatal Medicine, Univ. of California, San Diego, CA**
ORAL PLENARY SESSION I

Thursday, January 21, 1999
8:00 am - 10:00 am

Moderators:  Mary E. D’Alton, MD
President, SMFM

Steven L. Clark, MD
Immediate Past President, SMFM

Judges:  Eleanor L. Capeless, MD
Robin Field, MD
E. Albert Reece, MD

Continental Ballroom 4-6
Abstract Numbers 1-8
1. METRONIDAZOLE DID NOT PREVENT PRETERM BIRTH IN ASYMPTOMATIC WOMEN WITH BACTERIAL VAGINOSIS. M. Kikunohj, J. C. CareyS for the NICHD MFMU Network, Bethesda MD.

**OBJECTIVE:** To determine whether treatment of asymptomatic pregnant women with bacterial vaginosis (BV) reduces preterm delivery.

**STUDY DESIGN:** In this multicenter, double-blind, placebo-controlled trial, women with BV on Gram stain and negative T. vaginalis cultures were randomized at 15-23 weeks to metronidazole (ME, n=966) or placebo (PL, n=987). Women took 8 capsules (2 grams) of ME or PL in the presence of a nurse and were given another dose to take 48 hours later. This regimen was repeated at 24-29 weeks. The primary outcome was preterm (<37 week) delivery; other outcomes included PTD after preterm labor, PTD after preterm PROM (PPROM), birth <32 weeks, birth wt <2500 grams and <1500 grams.

**RESULTS:** The two groups did not differ significantly on baseline characteristics. Outcomes were present for 1901 (97.3%) women, 946 ME and 955 PL. The occurrence of adverse outcomes is shown in the table.

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<th>ME</th>
<th>PL</th>
<th>RR 95% CI</th>
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<tr>
<td>Total PTD</td>
<td>12.2%</td>
<td>12.4%</td>
<td>0.98</td>
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<td>PTD-PL</td>
<td>4.8%</td>
<td>5.3%</td>
<td>0.90</td>
</tr>
<tr>
<td>PTD-PPROM</td>
<td>4.2%</td>
<td>3.8%</td>
<td>1.12</td>
</tr>
<tr>
<td>Birth</td>
<td>&lt;32 wks</td>
<td>2.3%</td>
<td>0.89</td>
</tr>
<tr>
<td></td>
<td>&lt;2500 grams</td>
<td>11.0%</td>
<td>0.97</td>
</tr>
<tr>
<td></td>
<td>&lt;1500 grams</td>
<td>2.1%</td>
<td>0.80</td>
</tr>
</tbody>
</table>

*ME was not beneficial among women with a prior PTD (RR=1.25); among women treated at <20 weeks (RR=0.87); among women who did not receive clinically indicated antibiotics effective against BV (RR=0.99); nor among more compliant women (RR=1.11). At 24-29 weeks, BV persisted in 61% of the PL and 21% of the ME groups; persistence did not increase the PTD risk (RR=1.01).*

**CONCLUSION:** Although effective at eliminating BV, treatment of asymptomatic BV with metronidazole did not prevent PTD or other adverse outcomes.


**OBJECTIVE:** The purpose of this study was to test the hypothesis that the presence of an amniotic fluid (AF) inflammatory response is a risk factor for the development of cerebral palsy.

**STUDY DESIGN:** This cohort study included 104 preterm singleton patients initially treated with intravenous magnesium sulfate for preterm labor, who were enrolled in a multicenter trial. AF samples were used where appropriate.

**RESULTS:** PGE2 content was markedly enhanced (5-fold, p<0.05) in amnion derived from term laboring women, compared to term non-laboring women. The differences in PGE2 content in other issues were not significant. The enhanced PGE2 content during labor was associated with a higher expression of amniotic COX-2. Amnion PGE2 production in vitro was diminished (6-fold, p<0.05, t-test) by preincubation with indomethacin (50 μM). Importantly, a similar, concentration-dependent inhibition was observed with the selective COX-2 inhibitors ibuprofen (0.38%, w/w) and diclofenac (1.25%, w/w), but not with the COX-1 inhibitor valeryl salicylate. Dexamethasone (1 μM), a transcriptional repressor of COX-2, also diminished (2.5-fold) amnion PGE2 production.

**CONCLUSIONS:** Prostaglandin production during human parturition was associated with enhanced expression and activity of amniotic COX2. Selective inhibitors of COX-2 are as effective as indomethacin in diminishing PGE2 production in vitro, and may have a role in treatment of women with preterm labor.


**OBJECTIVE:** To test the hypothesis that enhanced expression and activity of cyclooxygenase-2 (COX-2) is associated with human parturition.

**STUDY DESIGN:** Samples of myometrium, decidua, chorion, and placenta were obtained from women (n=12) undergoing term cesarean delivery with or without labor. Samples were analyzed for COX-2 content using ELA, and for COX-1 or COX-2 expression using western analysis with isozyme specific antibodies. Inhibition of isozyme activity by miniced was generated by using the presence of specific inhibitors in the presence of a saturating concentration (10μM) of arachidonic acid.

**RESULTS:** PGE2 content was markedly enhanced (5-fold, p<0.05) in amnion derived from term laboring women, compared to term non-laboring women. The differences in PGE2 content in other issues were not significant. The enhanced PGE2 content during labor was associated with a higher expression of amniotic COX-2. Amnion PGE2 production in vitro was diminished (6-fold, p<0.05, t-test) by preincubation with indomethacin (50 μM). Importantly, a similar, concentration-dependent inhibition was observed with the selective COX-2 inhibitors ibuprofen (0.38%, w/w) and diclofenac (1.25%, w/w), but not with the COX-1 inhibitor valeryl salicylate. Dexamethasone (1 μM), a transcriptional repressor of COX-2, also diminished (2.5-fold) amnion PGE2 production.

**CONCLUSIONS:** Prostaglandin production during human parturition was associated with enhanced expression and activity of amniotic COX2. Selective inhibitors of COX-2 are as effective as indomethacin in diminishing PGE2 production in vitro, and may have a role in treatment of women with preterm labor.

4. MAINTENANCE ORAL NIFEDIPINE FOR PRETERM LABOR: A PROSPECTIVE, RANDOMIZED CLINICAL TRIAL. LB Carr1, JA Spinnato1, K. Knebel2, AL Clark2. Dept. Of Ob/Gyn, Univ. of Washington, Seattle, WA, and Univ of Louisville, Louisville, KY.

**OBJECTIVE:** To evaluate the efficacy of maintenance oral nifedipine in patients initially treated with intravenous magnesium sulfate for preterm labor.

**STUDY DESIGN:** Patients diagnosed with preterm labor and receiving intravenous magnesium tocolysis between 24 and 33.9 weeks gestation were randomized (No Tx) upon discontinuation of the magnesium. Gestational age at delivery, readmissions for preterm labor, and maternal and neonatal outcomes were evaluated. A sample size of 50 was required to detect a 10 day difference in mean time gained (p=0.2, α=0.05). Statistical analysis was based on intent to treat. P, Chi-squared, and Fisher’s exact test were used where appropriate.

**RESULTS:** Seventy patients were enrolled and randomized to nifedipine (n=35) or no treatment (n=35). There were no statistically significant differences in age, race, parity, preterm delivery risks, enrollment gestational age at delivery, vaginal cervical examination or gestational age at delivery between the groups. Neonatal hospital days, rates of IVH and RDS were similar between the groups.

<table>
<thead>
<tr>
<th>Enroll GA (wks)</th>
<th>Deliv GA (wks)</th>
<th>Time Gained (days)</th>
<th>Readmit For PTL</th>
<th>NICU Admit</th>
<th>Birth weight (grams)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nifedine</td>
<td>35±23</td>
<td>32±20</td>
<td>3%</td>
<td>25%</td>
<td>2500-3000</td>
</tr>
<tr>
<td>No Tx</td>
<td>34±23</td>
<td>35±24</td>
<td>9%</td>
<td>31%</td>
<td>1000-2500</td>
</tr>
</tbody>
</table>

**CONCLUSIONS:** Maintenance oral nifedipine does not significantly increase the time gained in pregnancy for patients initially treated with intravenous magnesium sulfate tocolysis for preterm labor.

OBJECTIVE: Nitric oxide donors have been proposed in the treatment of pregnancy-induced hypertension and preterm labor. However, there are no studies assessing hemodynamic changes at the level of cardiac transvalvular flows in placentas. Our objective was to determine whether administration of transdermal nitroglycerin was associated with changes of main fetal hemodynamic cardiac parameters.

STUDY DESIGN: This study was approved by our local institutional review board. Sixteen women with either abnormal umbilical or uterine artery resistance (S/D > 95 percentile for gestational age, group A) and 26 patients with normal Doppler findings (group B) were prospectively evaluated. A 5 mg patch releasing nitroglycerine for 24 hours was administered in all cases. Fetal cardiac hemodynamics was assessed by measuring mitral (MV) and tricuspid (TV) flows (E and A peak velocities and E/A ratio) and outflow tract parameters (aortic (Ao) and pulmonary (MPA) velocity time integral [VTI], mean and peak velocities). Also, Doppler velocimetry of uterine, umbilical and cerebral territories was performed. Measurements were obtained before 2 h and 24 h after patch administration. Statistical analysis included Friedman test for repeated measurements.

RESULTS: No significant differences were found in Doppler measurements of the uterine, umbilical and cerebral territories obtained before 2 h and 24 h after nitroglycerine patch administration in patients of group A. A tendency towards a decrease in resistance was detected in the uterine artery. Similar findings were observed in group B, although the uterine resistance did not show any changes whatever. Main fetal cardiac parameters for group A are depicted in the following table (median and range):

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Before</th>
<th>2 hours</th>
<th>24 hours</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MV E/A</td>
<td>0.87 (0.63-1.17)</td>
<td>0.82 (0.65-1.10)</td>
<td>0.83 (0.64-1.42)</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>TV E/A</td>
<td>0.75 (0.69-1.26)</td>
<td>0.76 (0.67-1.32)</td>
<td>0.82 (0.74-1.41)</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Ao VTI</td>
<td>0.07 (0.04-0.11)</td>
<td>0.07 (0.04-0.11)</td>
<td>0.08 (0.04-0.14)</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>MPA VTI</td>
<td>0.08 (0.04-0.14)</td>
<td>0.08 (0.05-0.13)</td>
<td>0.09 (0.06-0.13)</td>
<td>&gt;0.05</td>
</tr>
</tbody>
</table>

CONCLUSION: Main fetal cardiovascular dynamics are not affected by transdermal administration of nitroglycerin, regardless of the utero-feto-placental flow velocimetric status. These findings provide preliminary reassurance for future utilization of nitric oxide donors during pregnancy.

LONGITUDINAL CHANGES IN AMINO ACID INSULIN SENSITIVITY DURING PREGNANCY. P. Catalano, L. Huston*, S. Kalhan*, Dept. OB/GYN and Pediatrics, MetroHealth Medical Center, Case Western Reserve University, Cleveland, Ohio.

OBJECTIVE: To evaluate the affect of pregnancy on amino acid: leucine (LEU) and phenylalanine (PHE), insulin sensitivity in control (CTL) and gestational diabetic (GDM) subjects.

STUDY DESIGN: 10 CTL and 8 GDM were evaluated in early (E=18-22 weeks) and late (L=32-36 weeks) pregnancy using stable isotopes; 13C LEU and 2H4 PHE in conjunction with low (20 mU/mL/min) and high (40 mU/mL/min) dose insulin clamps.

RESULTS: There were no significant differences in age, weight, BMI, fat mass, fat free mass (FFM), % fat or parity between groups. There was a significant (p=0.004) less suppression of LEU turnover during low dose insulin infusion in both CTL and GDM in L vs E pregnancy.*** There was no significant difference in PHE turnover from E to L pregnancy, but a trend (p=0.08) for increased PHE turnover during low dose insulin in GDM vs CTL.***

CONCLUSION: There is a decrease in amino acid insulin sensitivity (LEU) with advancing gestation in both CTL and GDM. Additionally, GDM have decreased basal LEU turnover vs CTL, thereby decreased amino insulin sensitivity. We conclude that pregnancy affects not only glucose sensitivity but other insulin sensitive nutrients which may affect fetal growth. NIH R01-DK-11089 and GCRC #RR00080.
ORAL CONCURRENT SESSION A

Medical Complications

Thursday, January 21, 1999
1:00 pm - 3:30 pm

Moderators: Valerie M. Parisi, MD
Michael L. Socol, MD

Judges: John C. Hauth, MD
Roger B. Newman, MD
Karen A. Rosene, MD

Continental Ballroom 1-4
Abstract Numbers 9-18
LEPTIN AND FETAL GROWTH: A NEW PIECE IN THE PUZZLE OF FETAL MACROsomia.

Maternal and fetal leptin levels were measured in 53 consecutive term neonates from non-diabetic mothers. The aim of the study was to analyze the correlation between maternal serum leptin concentrations and maternal BMI and birth weight. A significant correlation was found between maternal BMI and birth weight (r=0.39; p=0.007). In contrast, no correlation was observed between maternal serum leptin concentrations and birth weight.

RESULTS: Serum leptin concentrations correlated significantly with maternal serum insulin (R=0.679) and umbilical cord leptin concentrations (p<0.0001). Multiple regression analysis was performed to determine independent risk factors for maternal macrosomia. Institutional Review Board approved this study.

RESULTS: The independent risk factor that significantly correlated with fetal macrosomia was fetal leptin concentration (p<0.0001, beta=0.679). No significant correlation was observed between maternal serum leptin levels and birth weight.

CONCLUSIONS: Our data demonstrate the bioavailability of leptin as a growth promoter of fetal macrosomia. The high leptin levels observed in maternal and umbilical cord serum suggest that the fetus is exposed to the leptin in utero. Further studies are needed to determine the role of leptin in fetal growth and development.

OBJECTIVE: Managed care plans have adopted risk assessment (RA) tools as a part of "disease state" management strategies to assist with reducing poor pregnancy outcome and related costs. We evaluated the relationship of maternal risk factors to determine which pregnancy risk factors are associated with NICU (Level II, III) admission.

STUDY DESIGN: Telephone RA questionnaires were conducted by perinatal nurse interviewers with 52,996 pregnant women during 1996-97 calendar years as part of managed care maternity risk screening and education programs. A series of three interviews were conducted at 17 weeks and 28 weeks average gestational age, and 2 weeks postpartum. The results of these interviews were reported as patients' case notes. Those risk factors significantly associated with >20% probability of NICU admission by \( x^2 \) analysis were included in a logistic regression model.

RESULTS: Ten risk factors were found to be significantly associated with NICU admission by \( x^2 \); of these nine by logistic regression (see table).

<table>
<thead>
<tr>
<th>Condition</th>
<th>Odds Ratio</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infertility Treatment</td>
<td>1.02</td>
<td>(0.92, 1.15)</td>
</tr>
<tr>
<td>Cerebral</td>
<td>1.35</td>
<td>(1.25, 1.56)</td>
</tr>
<tr>
<td>Oligohydramnios</td>
<td>1.14</td>
<td>(1.05, 1.24)</td>
</tr>
<tr>
<td>Preterm Labor</td>
<td>1.63</td>
<td>(1.55, 1.70)</td>
</tr>
<tr>
<td>Placental Abruption</td>
<td>1.85</td>
<td>(1.55, 2.22)</td>
</tr>
<tr>
<td>PIH</td>
<td>2.35</td>
<td>(1.76, 1.97)</td>
</tr>
<tr>
<td>Twin Gestation</td>
<td>3.35</td>
<td>(2.92, 2.45)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>2.49</td>
<td>(2.18, 2.85)</td>
</tr>
<tr>
<td>Premature PROM</td>
<td>4.01</td>
<td>(3.68, 4.37)</td>
</tr>
<tr>
<td>2 Triple Gestation</td>
<td>6.06</td>
<td>(5.21, 7.05)</td>
</tr>
</tbody>
</table>

CONCLUSION: The results of this analysis on a managed care population show similar risk factors to those traditionally associated with NICU. Multiple gestation, PROM and diabetes, identified in only 8% of pregnant women, more than double the risk of NICU admission. Although there was an initial association between infertility treatment and NICU admission \( x^2 \), a more complete analysis showed that the resulting multiple gestation is the primary and independent determinant of NICU admission.

THE SAFETY AND EFFICACY OF PROTEASE INHIBITOR THERAPY FOR HIV INFECTION DURING PREGNANCY. A. Sok, F. Kramer*, M. Fasset, M. Khoury*, Deps. of Obstetrics and Gynecology, Medicine, Pediatrics, University of Southern California School of Medicine, Los Angeles, CA.

OBJECTIVES: To evaluate the safety and efficacy of protease inhibitors in pregnant women with HIV infection and their impact on pregnancy outcome.

STUDY DESIGN: Since mid-1996, HIV infected pregnant women presenting to our center were offered combination antiretroviral therapy; 24 of the 39 women on PI had AIDS. At conception and continued therapy. We analyzed interleukin 2 (IL2) and chemokine production in umbilical cord and peripheral cord blood, stimulated with HIV envelope specific peptides as well as HIV specific cytotoxic activity (CTL).

RESULTS: Cord and peripheral blood specimens obtained shortly after birth from HIV infected infants did not exhibit HIV-specific T-cell helper (TH) and CTL (6/7) 85%. The responses developed between 2 and 9 months of age in infants with slowly developing HIV infection. Conversely, HIV envelope specific IL-2 expression was detected at birth (7/9) 78% of uninfected infants of HIV positive mothers. These responses returned to baseline by the first year of age, and were rarely associated with HIV-specific CTL. Infants with HIV specific IL-2 responses exhibited enhanced production of β chemokines, known to mediate potent inhibition of macrophage tropic HIV isolates.

CONCLUSION: Our data demonstrate delayed development of TH activities in HIV infected infants, suggesting that non-lytic immune responses are likely to be important in protection against vertical transmission of HIV.

OBJECTIVE: To evaluate the impact of maternal antibiotic treatment (Abx) before labor (AP) and intrapartum (IP) on the bacterial antimicrobial resistance in infants with documented sepsis.

STUDY DESIGN: Concurrent review was performed for 8,527 consecutive pregnancies (8,657 births) at 6 hospitals in Shelby County. Prenatal records, maternal and neonatal hospital records were reviewed for antibiotic treatment, culture results, and perinatal outcomes. Only clinically ill neonates with a positive blood or CSF culture were diagnosed with "documented sepsis" of early (<7 days: "ES") or late (>7 days: "LS") onset. Infant outcomes and culture results were evaluated based on the occurrence and timing of maternal antibiotic exposure before delivery.

RESULTS: There were 102 septic neonates (1.2%); 59 (58%) and 55 (54%) had at least 1 episode of ES or LS respectively. Sepsis was rarely caused by the same organism as documented in maternal cultures (7.8%). Sepsis was 20-fold more common after preterm birth (5.9 vs. 0.3%, p<0.001) with 77% of infants delivering preterm. Of septic neonates, 44% were exposed to AP Abx, and 54% to IP Abx. Overall, 70% were exposed to Abx either AP or IP. 40% of cultured pathogens were resistant to Ampicillin (Amp). Amp resistant sepsis increased with preterm birth (47 vs. 17%, p=0.01), AP Abx (53 vs. 30%, p=0.02), IP Abx (53 vs. 26%, p=0.005), and with any prenatal Abx exposure (51 vs. 16%, p=0.001). GBS sepsis was less common with IP Abx (7 vs. 23% of isolates, p=0.02) but not AP abx. Infant pneumonia and survival were similar regardless of prenatal Abx exposure. Further analysis of septic infants whose mothers received Abx either AP or IP revealed 45% to carry a pathogen resistance to at least one of the maternal Abx. Those with IP exposure were more likely to show resistance than those with just AP exposure (51 vs. 21%, p=0.02).

CONCLUSION: Ante- and intrapartum antibiotic exposure are associated with an increased incidence of ampicillin resistant neonatal sepsis. Intrapartum antibiotics are associated with a higher risk of neonatal sepsis resistant to amanitally administered agent.


OBJECTIVE: To evaluate the biological parameters obtained in amniocentesis and cordocentesis in the prenatal diagnosis of congenital toxoplasmosis (CT).

STUDY DESIGN: 122 non-selected pregnant women with a toxoplasmosis seroconversion during pregnancy were subjected to an invasive prenatal diagnosis for CT. All children from these mothers were followed for at least one year. Definite diagnosis of CT was defined as the persistence of IgG in the child at one year of age. The following parameters were evaluated: isolation of Toxoplasma gondii (TG) by mouse inoculation (MI) of amniotic fluid, toxoplasma PCR on amniotic fluid, and toxoplasma IgM and IgG on cord blood. Sensitivity (SE), specificity (SP), positive predictive value (PPV) and negative predictive value (NPV) were calculated.

RESULTS:

<table>
<thead>
<tr>
<th></th>
<th>SE</th>
<th>SP</th>
<th>PPV</th>
<th>NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amniotic fluid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MI</td>
<td>58.3</td>
<td>98.4</td>
<td>98.3</td>
<td>86.5</td>
</tr>
<tr>
<td>Cell culture</td>
<td>15.3</td>
<td>100</td>
<td>100</td>
<td>77</td>
</tr>
<tr>
<td>PCR</td>
<td>81.3</td>
<td>96</td>
<td>86.6</td>
<td>94</td>
</tr>
<tr>
<td>MI + PCR</td>
<td>90.9</td>
<td>87.5</td>
<td>86.9</td>
<td>91.3</td>
</tr>
<tr>
<td>Fetal Blood</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MI</td>
<td>31.2</td>
<td>100</td>
<td>100</td>
<td>78.8</td>
</tr>
<tr>
<td>IgM</td>
<td>46.6</td>
<td>95.3</td>
<td>77.7</td>
<td>81.6</td>
</tr>
<tr>
<td>IgA</td>
<td>38.4</td>
<td>97.4</td>
<td>83.3</td>
<td>82.5</td>
</tr>
</tbody>
</table>

CONCLUSIONS: The combination of a PCR test with the classical mouse inoculation of amniotic fluid can identify 90% of fetuses congenitally infected with toxoplasmosis.
ORAL CONCURRENT SESSION B

Basic Science

Thursday, January 21, 1999
1:00 pm - 3:30 pm

Moderators: Pat Duff, MD
Kenneth Ward, MD

Judges: Lowell Davis, MD
Helen H. Kay, MD
Frank C. Miller, MD

Continental Ballroom 6-9
Abstract Numbers 19-28
A ROLE OF THE CELL DEATH FACTOR SYSTEM (FAS/FAS LIGAND) IN SPONTANEOUS RUPTURE OF MEMBRANES. E. Maymon1, S.S. Edmon2, P. Parmer2, B. O'Connor3, M. Min2, B.H. Young2, R. Romero, Perinatology Research Branch, NICHD/NIH, Bethesda MD and Department of Obstetrics and Gynecology, Wayne State University/Hutzel Hospital, Detroit, MI.

OBJECTIVE: Programmed cell death (apoptosis) has been implicated in the mechanisms responsible for spontaneous rupture of the fetal membranes. The "death factor system", composed of Fas Ligand (FasL) and its receptor (Fas), is widely involved in apoptosis and has been identified in fetal membranes and placenta. Binding of FasL to Fas on the cell surface leads to death. Soluble forms of Fas (sFas) have been identified in fetal membranes and amniotic fluid (AF) and sFasL is detectable in amniotic fluid (AF).

STUDY DESIGN: AF was retrieved by transabdominal amniocentesis from 152 women from the following groups: 1) term gestation with intact membranes (n=29); 2) term gestations with rupture of membranes (n=20); 3) preterm gestation with intact membranes (n=37); 4) preterm PROM (n=41); and 5) midtrimester of pregnancy (n=25). sFas was measured by ELISA and FasL was detected by Western blot analysis using polyclonal antibodies. All patients had negative AF cultures for microorganisms.

RESULTS: 1) sFas and sFasL were detected in all AF samples indicating that these "death factors" are physiologic constituents of AF during normal pregnancy; 2) In term gestations, women with ROM had significantly lower median AF sFas concentrations than patients with intact membranes (median: 2.2 u/ml range 1.4-4.6 vs. median: 9.8 u/ml range 1.0-5.0 p<0.05, respectively); 3) In preterm gestations, women with ROM had lower median sFas concentrations than those with intact membranes (median: 3.2 u/ml range 0.3-22.1 vs. median: 4.5 u/ml range 0.18-17.5 p<0.05, respectively); 4) sFasL concentrations show a decreasing trend with gestational age (median sFas concentrations than those with intact membranes, (median: 2.2 u/ml range 1.4-4.6 vs. median: 9.8 u/ml range 1.0-5.0 p<0.05, respectively); 5) Higher concentrations of sFas and sFasL are detectable in amniotic fluid (AF) and whether rupture of membranes (ROM) is associated with changes in AF concentrations of sFas and sFasL.

CONCLUSIONS: 1) sFas/sFasL are physiological constituents of AF, implying that this system has a role during development; 2) Increased concentrations of sFas and decreased concentrations of sFasL (its receptor) were found in patients with ROM, and 3) Increased availability of FasL may play a role in spontaneous ROM and preterm gestations.

20 GENE THERAPY IN UTERO, SUCCESSFUL INDUCTION OF 3-gALACTOSIDASE DASE IN A RABBIT MODEL. T. Lyne Baumgartner1, B.J. Baumgarmer2, Lynda Hudson3, and Kenneth J. Moise, Jr.4 Dept. OB/Gyn. and Repro. Sci, UTHSC, Houston, TX, 2Dept. Neurosurg., and 3Dept. OB/Gyn., Div. of Mat. Fetal Med., Baylor College of Med., Houston, TX.

OBJECTIVE: Gene therapy holds promise for the treatment of inherited disorders of metabolism such as phenylketonuria, Tay-Sachs disease, cystic fibrosis, and congenital adrenal hyperplasia. Correction of these enzyme deficiencies may eliminate these disorders. Gene therapy may provide the means to replace such missing enzymes.

STUDY DESIGN: The brains of fetal rabbits were injected in utero with an adenoviral vector carrying the gene for 3-galactosidase (beta-gal). The vector was injected under ultrasound guidance into the brains of 4 pups per litter (3 litters total) at 27 days gestation. Upon delivery of the rabbit pups 2-3 days later, the livers were processed for X-gal histochemistry to detect beta-gal activity. Polymerase chain reaction (PCR) was also performed to independently detect vector DNA.

RESULTS: The brains of 7 from 12 pups injected demonstrated beta-gal activity in the nuclei of liver serosal cells, parenchymal hepatocytes, or medullary columns of the gallbladder. The most intense staining was noted in a small area of the liver, approximately 80 mm3 in volume. PCR products were detected in extracts from 10 of 12 livers.

CONCLUSIONS: These results suggest that vectors carrying genes for specific enzymes can be delivered to fetuses in utero, and that expression of the enzyme can be detected after delivery. The small area of transduction in this study may be due to the short time elapsed between injection and delivery.

21 VASCULAR REACTIVITY IN THE PERFUSED UTERINE BED OF NON-PREGNANT AND PREGNANT RATS. E. Falup1, Y. Vederenkov2, G. Saadle1, J. Chudi1, R. Garfield2, Dept. Of OB/Gyn, The New York Medical School, Galveston, TX and Shering AG, Berlin, Germany.

OBJECTIVE: To compare endothelium-dependent and endothelium-independent responses in the uterine vascular bed of non-pregnant and pregnant rats.

STUDY DESIGN: The abdominal aorta was cannulated close to bifurcation in nonpregnant and timed-pregnant Sprague-Dawley rats (n=14 (mid) and 21 (term) of gestation). The adjacent branches were ligated. Perfusion of one uterine horn through the uterine artery was achieved by cannulating the uterine vessels and arterial vessels were then closed and placed into an organ chamber for perfusion/superfusion with Krebs buffer (pH 7.4) containing indomethacin (10-4 M) and 2% dextan. Intraluminal pressure was monitored using a Harvard transducer connected to the data acquisition system. The perfusion pressure was adjusted to maintain an intraluminal pressure ~50 mmHg and was kept constant. After 30 min of equilibration, the perfusion pressure was increased with phenylephrine (PE, 10-6 M). Vascular response to phenylephrine (PE, 10-6 M), prostacyclin (PGI2, 10-8 M), substance P (SP, 10-6 M) and DE/NO (10-5 M) were determined in the presence and absence of L-NAME (10-6 M). The % change in perfusion pressure from the response was calculated for each agent. ANOVA and Newman-Kuels test were used as appropriate (significance P<0.05).

RESULTS: A) Induced relaxation with no significant differences between nonpregnant, mid-pregnant and term animals. B) Induced an initial decrease in perfusion pressure followed by an increase with no significant differences between the 3 groups. C) No significant effects after L-NAME. D) Induced a decrease in perfusion pressure in all groups, with a more significant decrease at term compared to non- and mid-pregnant animals. E) L-NAME significantly increased perfusion pressure in all groups, with a more significant increase at term compared to non- and mid-pregnant animals. F) The % change in perfusion pressure from the response was calculated for each agent. ANOVA and Newman-Kuels test were used as appropriate (significance P<0.05).

CONCLUSIONS: A) Induced relaxation with no significant differences between nonpregnant, mid-pregnant and term animals. B) Induced a decrease in perfusion pressure followed by an increase with no significant differences between the 3 groups. C) No significant effects after L-NAME. D) Induced a decrease in perfusion pressure in all groups, with a more significant decrease at term compared to non- and mid-pregnant animals. E) L-NAME significantly increased perfusion pressure in all groups, with a more significant increase at term compared to non- and mid-pregnant animals. F) The % change in perfusion pressure from the response was calculated for each agent. ANOVA and Newman-Kuels test were used as appropriate (significance P<0.05).
23 A ROLE FOR THE 72Kd GELATINASE AND ITS INHIBITOR IN HUMAN PARTUITION. E. Maymon, R. Romero, S. Eshhar, S. Eshhar, M. Mazer, B. H. Yoon, R. Romero. Prenatal Research Branch, NICHD/NIH, Bethesda, MD and the Department of Obstetrics and Gynecology, Wayne State University, Detroit, MI. OBJECTIVE: The process of parturition involves the degradation of the extracellular matrix in fetal membranes. Matrix metalloproteinases (MMPs) are enzymes capable of degrading extracellular matrix macromolecules, including collagens. Tissue inhibitors of metalloproteinases (TIMPs) inhibit the activity of MMPs by covalently binding to the enzymes. MMP-2 degrades Type IV collagen and TIMP-2 is its specific inhibitor. The objective of this study was to determine if human parturition is associated with changes in the concentrations of MMPs, MMP-2/TIMP-2, and MMP-2/TIMP-2 molar ratio in amniotic fluid (AF).

STUDY DESIGN: A cross-sectional study was conducted with women in the following categories: 1) term in intact membranes, in labor (n=25); 2) term not in labor (n=26); 3) preterm labor in intact membranes, in labor (n=25); 4) preterm labor in intact membranes, not in labor (n=38); 5) PTL with and without PROM; 6) PROM; and 7) PTNL in intact membranes, in labor (n=25). All measurements were performed in AF from the first 24h after delivery. An ELISA was used to determine the concentration of MMPs, MMP-2/TIMP-2, and MMP-2/TIMP-2 molar ratio in AF samples.

RESULTS: 1) Concentration of MMP-2 was significantly increased with advancing gestational age (p=0.005; Kruskal-Wallis). TGF-Eta, median 252.2 ng/ml (24.6-449.8), term not in labor: median 254.2 ng/ml (141.4-656) (p=0.588, p=0.001). No correlation was found between MMP-2 concentrations and gestational age (r=0.11, p=0.3); 2) Patients with spontaneous labor at term had a significantly lower median concentrations of TIMP-2 compared to those in labor (Table 1: p=0.003); 3) Patients with PTNL who delivered had a lower median MMP-2/TIMP-2 ratio than those with PTNL who delivered at term (comparison between groups 3 and 4, p=0.076); 4) Intramuscular infection in women with PTNL was associated with a significant decrease in TIMP-2 (Table 2: p=0.05).

CONCLUSIONS: TIMP-2 concentration increases with gestational age. Human parturition (preterm and term) is associated with lower TIMP-2 and an increased MMP-2/TIMP-2 ratio.

24 EVIDENCE FOR DIFFERENTIAL EXPRESSION OF GROWTH FACTORS AND CYTOKINES IN THE URINE OF FETUSES WITH OBSTRUCTIVE UROPATHY. M.P. Johnson, R. Romero, S. Eshhar, B. Feldman, S. Kasprzak, P. Qureshi, and M.I. Evans. Dept. OB/GYN, Molecular Medicine & Genetics, and Pathology, Wayne State University, Detroit, MI, and Perinatal Research Branch, NICHD, Bethesda, MD. OBJECTIVE: Obstruction of the fetal urinary tract may lead to renal dysplasia and failure. Several inflammatory cytokines and growth factors have been implicated in the response of renal tissue to injury. We studied fetuses with lower urinary tract obstruction (LUTO), and compared their corresponding wild-type controls. The objective of this study was to determine if human parturition is associated with changes in the concentrations of growth factors and cytokines in fetal urine, 2) having good (n=23) or bad (n=24) prognosis/ outcome, Urinary cytokines were measured in a specific and sensitive immunoassays for transforming growth factor (TGF), ANG, EGF, TIMP-2 and an increased MMP-2/TIMP-2 ratio.

STUDY DESIGN: A cross-sectional study was conducted with women in the following categories: 1) term in intact membranes, in labor (n=25); 2) term not in labor (n=26); 3) preterm labor in intact membranes, in labor (n=25); 4) preterm labor in intact membranes, not in labor (n=38); 5) PTNL with and without PROM; 6) PROM; and 7) PTNL in intact membranes, in labor (n=25). All measurements were performed in AF from the first 24h after delivery. An ELISA was used to determine the concentration of MMPs, MMP-2/TIMP-2, and MMP-2/TIMP-2 molar ratio in AF samples.

RESULTS: 1) The concentration of MMP-2 increased with advancing gestational age (median: 66.95 ng/ml, term not in labor, median 252.2 ng/ml (24.6-449.8), term not in labor: median 254.2 ng/ml (141.4-656) (p=0.588, p=0.001). No correlation was found between MMP-2 concentrations and gestational age (r=0.11, p=0.3); 2) Patients with spontaneous labor at term had a significantly lower median concentrations of TIMP-2 compared to those in labor (Table 1: p=0.003); 3) Patients with PTNL who delivered had a lower median MMP-2/TIMP-2 ratio than those with PTNL who delivered at term (comparison between groups 3 and 4, p=0.076); 4) Intramuscular infection in women with PTNL was associated with a significant decrease in TIMP-2 (Table 2: p=0.05).

CONCLUSIONS: TIMP-2 concentration increases with gestational age. Human parturition (preterm and term) is associated with lower TIMP-2 and an increased MMP-2/TIMP-2 ratio.

25 HUMAN CHORIONIC GONADOTROPIN EXHIBITS POTENT TOCOLYSIS OF PRETERM LABOR IN A SMALL ANIMAL MODEL. J. Kistman, J. Spinnato, L. Goldsmith, M. Zimmerman, M. Klem, G. Rao. Dept. OB/Gyn, Univ. of Louisville, Louisville, KY. OBJECTIVE: The purpose of this study was to test the tocolytic capability of human chorionic gonadotropin (HCG) in a small animal model.

STUDY DESIGN: Previous studies in our lab have demonstrated that human myometrium contains receptors for HCG, and that HCG can inhibit myometrial contractions in vitro. We therefore hypothesized that administration of HCG prior to preterm delivery would induce tocolysis. A preterm delivery model was developed utilizing prostaglandin F2-alpha (PG) to induce preterm labor in GH3/HeN inbred mice. The potential tocolytic effect of HCG was then tested in a pilot study by pre-treating mice with HCG 4 hours before induced delivery. The initial promising results of the tocolytic ability of HCG was assessed by administration of two different HCG doses given 4 hours after administration of PG. In this phase, mice received 20 mcg PG and were then randomized to receive saline, vehicle (n=38), HCG 100 IU (n=38), or 1000 IU HCG (n=38). Tocolytic effect was determined by continuous video surveillance, as well as frequent direct observation. The observers were blinded to which treatment regimen was given.

RESULTS: In 52 pregnant mice injected on day 16 (80%) of gestation, pilot study confirmed that intraperitoneal injection of 20 mcg on day 16 of gestation consistently induced preterm delivery compared to saline treated controls (PG delivery mean, s.d.: 19.3±2.9 hours; saline: 35.5±13.6 hrs, p<0.001). Mice pre-treated with HCG (100 IU) demonstrated significant delays in delivery compared to the pregnant only group (PG only: 21.9±2.0 hrs; HCG pretreatment + PG: 48.5±2.0 hrs, p<0.0001; n=17). Mice treated with HCG (100 IU or 1000 IU) 4 hours after administration of PG demonstrated significant dose-dependent inhibition of postpartum delivery (PG only: 21.9±2.0 hrs; PG+100 IU: 47.0±2.5 hrs, PG + 1000 IU: 92.0±6.0 hrs, censored with retained pups confirmed in all cases, p<0.05; n=16).

CONCLUSIONS: HCG exhibits potent tocolysis of prostaglandin-induced preterm labor. The effect is dose-dependent. This preliminary study suggests that HCG may be a candidate for tocolytic therapy of preterm labor in human pregnancy.

26 BLOOD PRESSURE IN INOS KNOCKOUT MICE DURING PREGNANCY. G. Saade, M. Alp, S. Shi, L. McKay, M. Belfort, R. Garfield. Depts OB/Gyn, The Univ. of Texas Med. Branch, Galveston, TX and Univ of Utah, Salt Lake City, UT. OBJECTIVE: To determine if lack of a functioning inducible-nitric oxide synthase (iNOS or NOS2) results in hypertension in pregnant mice. STUDY DESIGN: Mice strain B6/129-NOS2 homozygous NOS2/NOS2 and control strain (wild type; B6/129F1) from Jackson Laboratory were used. Maternal blood pressure during pregnancy was measured at the same time each morning after several days of adjustment in the pregnant status of the animals. The mice were sacrificed after the last BP measurement and their tail was removed and homogenized. The blood pressure was measured daily by the tail-cuff method. Data were presented as median [range] or mean ± SD as appropriate. RESULTS: The number of pups in the KO group was significantly higher than that in the wild-type group (median [range]: 6.5[5 - 8] vs 4[3 - 6]; P = 0.04). The total weight of the pups in the KO group was higher than that in the wild-type group, but the difference did not reach statistical significance (mean ± SD: 11.1 ± 1.1 vs 7.7 ± 2.5 gm; P = 0.2). In the non-pregnant animals, blood pressure was measured daily for 4 days and the mean for each animal was used in the final analysis. The investigator measuring BP was blinded as to the group assignment or pregnancy status of the animals. The mice were sacrificed after the last BP measurement and their tail was removed and homogenized. The polymerase chain reaction was then used to determine NOS2 status. The number of live fetal pups and their total weight was also determined in the pregnant animals. Data were tested for normality and the groups were compared using one-way ANOVA. Student t test or Mann-Whitney test as appropriate. A P < 0.05 was used to denote statistical significance. Data presented as median [range] or mean ± SD as appropriate. RESULTS: The number of pups in the KO group was significantly higher than that in the wild-type group (median [range]: 6.5[5 - 8] vs 4[3 - 6]; P = 0.04). The total weight of the pups in the KO group was significantly higher than that in the wild-type group, but the difference did not reach statistical significance (mean ± SD: 11.1 ± 1.1 vs 7.7 ± 2.5 gm; P = 0.2). In the non-pregnant animals, blood pressure was measured daily for 4 days and the mean for each animal was used in the final analysis. The investigator measuring BP was blinded as to the group assignment or pregnancy status of the animals. The mice were sacrificed after the last BP measurement and their tail was removed and homogenized. The polymerase chain reaction was then used to determine NOS2 status. The number of live fetal pups and their total weight was also determined in the pregnant animals. Data were tested for normality and the groups were compared using one-way ANOVA, Student t test or Mann-Whitney test as appropriate. A P < 0.05 was used to denote statistical significance. Data presented as median [range] or mean ± SD as appropriate.
PREGNANCY-INDUCED PLASMA HYPO-OsmOLALITY: EVIDENCE FOR
ACTIVE MATERNAL AND PASSIVE FETAL Osmotic Resetting. MA
EL-Haddad, MG Ross, Dept OB/Gyn, HarborUCLA Med Ctr, Torrance, CA.

OBJECTIVE: Maternal plasma osmolality (osm) and sodium (Na) are
actively reset lower in pregnancy. Fetal plasma osm and Na parallel the
lowered maternal values, and then increase during the neonatal period. We
sought to determine whether fetal plasma osm is actively or passively reset by
comparing maternal and fetal/newborn plasma composition for 48 h
following birth.

STUDY DESIGN: Term pregnancies (n=9) with uncomplicated prenatal
and postnatal care were studied. Maternal venous and fetal umbilical artery
blood samples were drawn simultaneously at the time of delivery. Maternal
and newborn venous samples were drawn prior to breakfast and infant
feedings, respectively, on days 1 and 2 postdelivery. Plasma from mothers
and infants were compared for osmolality, sodium, chloride and potassium
concentrations, hematocrit and vasopressin levels. Newborn weight was
measured each morning. Repeated measures ANOVA and paired t-test
were used as appropriate (p<0.05).

RESULTS: At birth, maternal plasma Na and osm were greater than fetal
Na (137.8±0.5 vs 134.7±1.1 mEq/l) and osm (273.1±1.2 vs 271.0±1.9
mOsm). Whereas fetal plasma Na and osm increased significantly during
the newborn period, maternal plasma composition did not change. By day
1, fetal plasma Na and osm significantly exceeded maternal Na (138.6±1.4
vs 135.3±0.7 mEq/l; p=0.02) and osm (277.8±2.1 vs 270.3±2.2 mOsm;
p=0.01) and remained elevated on day 2.

CONCLUSIONS: These results indicate that maternal plasma osm
resetting does not reverse within the first 48 hours postdelivery, consistent
with an active, endocrine-mediated process. The rapid increase in neonatal
plasma osm and Na suggests that fetal plasma hypo-osmolality occurs
passively as a result of maternal plasma osm resetting. In utero passive fetal
plasma hypo-osmolality likely delays the fetal antidiuretic response to
hypertonicity and thus protects amniotic fluid volume during maternal
derhydration.

Maternal (solid) and Fetal (dashed)

Maternal (solid) and Fetal (dashed)

THE TUMOR NECROSIS FACTOR AND ITS SOLUBLE RECEPTOR PRO
FILE IN TERM AND PRETERM PARTURITION. E. Maymon, F. Ghezzi,
S. Edwin, M. Mazer, B.H. Yoon, R. Gomez, R. Romero, Perinatal
Research Branch, NICHD/NICHD, Bethesda, MD and Departments of
Obstetrics and Gynecology, Wayne State University/Hutzel Hospital
Detroit, MI.

OBJECTIVE: The common terminal pathway of parturition describes the
anatomical, biochemical, endocrine and clinical events present in the fetus
and/or mother in both term and preterm labor (PTL). Labor at term is
thought to result from physiologic activation of this pathway while PTL is
the result of pathologic activating events. The purpose of this study was to
determine if physiologic and pathologic activation could be discerned by
the analysis of a cytokine/receptor signaling system. Tumor Necrosis Factor
alpha (TNFα) and its soluble receptors (TNF-R1 and TNF-R2) were used as
probes given their pivotal role in the regulation of several pro-inflammatory
pathways.

STUDY DESIGN: The in vivo concentrations of TNFα and its soluble
receptors were studied in patients in term labor and PTL. Amniotic fluid
was retrieved from 149 women and TNFα, TNF-R1 and TNF-R2 measured
by high sensitivity immunoassays. Patients were classified into the following
groups: 1) Term in labor (n=29); 2) term not in labor (n=29); 3) PTL
without infection resulting in preterm delivery (n=34); 4) PTL leading to
term delivery (n=34); and 5) PTL with infection (n=23).

RESULTS: 1) Patients in spontaneous term labor had a higher median
concentration of TNFα and its soluble receptors (group 5 vs group 3 or 4,
p < 0.05 for each). 2) In contrast, patients with PTL leading to preterm delivery had higher
concentrations of TNFα but lower of TNF-R1 and TNF-R2 concentrations
than those at term not in labor (groups 1 and 2 p<0.01 for each); 2) In
patients with PTL leading to preterm delivery, concentrations of TNFα, TNF-R1 and TNF-R2 differed between patients with PTL leading to
preterm delivery (see group 3 vs group 4; p < 0.05); and 3) Microbial
invasion of the amniotic cavity was associated with dramatic increases in the
concentrations of TNFα and its soluble receptors (group 5 vs group 3 or 4,
p < 0.05 for each).

CONCLUSION: The TNF/soluble TNF receptor profile is different
in term and preterm parturition. Our observations provide support for the
thesis that preterm parturition is a pathologic condition. Increased TNF
soluble receptor concentrations may attenuate the deleterious effects of the
excess TNFα found in pathologic labor.
ORAL PLENARY SESSION II
(Fellows Plenary)
Friday, January 22, 1999
8:00 am - 10:00 am

Moderators: Donald R. Coustan, MD
J. Peter VanDorsten, MD

Judges: Sharon L. Dooley, MD
Kenneth Leveno, MD
Mary Jo O’Sullivan, MD

Continental Ballroom 4-6
Abstract Numbers 29-36
THE ROLE OF EXTRACELLULAR SUPEROXIDE DISMUTASE (ECSD) IN HUMAN PREGNANCY. KA Boggess, HK Kay, JD Crafo WP Herbert, TD Otway Deps of Ob/Gyn, Med, Path Duke University Medical Center Durham, NC.

OBJECTIVES: Nitric oxide (NO) may be involved in the maintenance of both low placental vascu lar tone and uterine quiescence during pregnancy. ECSD has been identified as a major regulator of NO bioavailability within the lung, and its expression within both murine uterus and placenta has been reported. We sought to characterize ECSD localization and activity in labored and unlabored myometrium, in placentas through healthy pregnancy, and at the site of placent al implantation.

STUDY DESIGN: First and second trimester villi were obtained at pregnancy termination; third trimester placental samples were taken at delivery. Lower uterine segment and placental implantation site biopsies were obtained at the time of c/s. After separation from cellular SOD, ECSD activity was measured by inhibition of cytochrome c reduction. ECSD protein localization was performed using indirect immunoperoxidase, and mRNA localization was determined by in-situ hybridization.

RESULTS: ECSD activity was similar in villi from all trimesters, though localization varied. Within third trimester placenta, ECSD localized to the vascular smooth muscle within the villous extracellular space, as expected; however, ECSD was found intracellularly within first and early second trimester trophoblast. ECSD activity was similar between labored and unlabored myometrium and localized to the extracellular matrix. At the placental implantation site, ECSD was intracellular, within intermediate trophoblasts. In-situ hybridization confirmed ECSD mRNA within the intermediate trophoblast.

CONCLUSIONS: ECSD is present in the human placenta, uterus, and at the site of placental implantation. Intraacellular ECSD within intermediate, first and second trimester trophoblasts suggests a role for ECSD at the site of implantation and during fetal vessel formation. That ECSD activity is similar between labored and unlabored myometrium suggests that other mechanisms may regulate uterine NO bioavailability.


OBJECTIVE: To test whether selective inhibition of either cyclooxygenase (COX)-1 or -2, the enzymes responsible for the first committed step in prostaglandin (PG) biosynthesis, can potentially result in therapeutic, but not toxic, effects of pharmacologic tocolysis.

STUDY DESIGN: Mice at day 14.5 gestation were treated with lipopolysaccharide (LPS) to reliably promote preterm labor (PTL) and assess the contributions of COX-1 and -2 in pharmacologic and genetic studies. Specific inhibitors of COX-1 (Reversatrol) and -2 (NS-398) were compared to the non-selective inhibitor indomethacin. Genetically altered mice deficient in COX-1 activity were also assessed. Parturition phenotypes of all animals were studied. Uterine and ovari an tissues from all study groups were analyzed for both COX-1 and -2 mRNA as well as local tissue prostaglandin (PG) concentration.

RESULTS: All animals receiving LPS delivered within 24 hours. A dose-dependent reduction in PTL was seen with increasing indomethacin doses, such that 10 mg/kg prevented delivery in 80% of mice. In contrast mice treated with Reversatrol or NS-398 alone and in combination failed to show significant attenuation of PTL. Mice deficient in COX-1 activity all delivered following LPS administration. Northern analysis of uterus and ovary from wild type mice demonstrated marked induction of COX-2 mRNA two hours following LPS with return to baseline at eight hours, while no induction in COX-1 mRNA activity was seen. Levels of PGF2a increased at 2 hours with return to basal levels at 8 hours. Indomethacin completely suppressed PGF2a production, while the specific inhibitors only partially attenuated production.

CONCLUSIONS: Combined pharmacologic inhibition of COX with near total ablation of PG production effectively attenuates LPS-mediated PTL in the mouse. The absence of COX-1 activity does not predict the occurrence of PTL. COX-2, rather than COX-1 mRNA is induced in inflammatory PTL in the mouse suggesting that development of more effective COX-2 inhibitors could effect successful tocolysis with reduced fetal side effects.


OBJECTIVE: To test the hypothesis that oral nifedipine and IV labetalol are equally effective in the acute management of hypertensive emergencies of pregnancy (HEP). STUdy DESIGN: We performed a prospective randomized double-blind comparison of oral nifedipine (10 mg) and IV labetalol (20 mg) in hypertensive patients with sustained diastolic blood pressure (DBP) >90 mm Hg or diastolic blood pressure (DBP) >110 mm Hg. Both agents were repeatedly at sequentially escalating dosages every 20 minutes until a therapeutic goal of DBP <160 mm Hg and DBP <100 mm Hg was achieved. Crossover occurred if the treatment goal was not achieved after 5 doses. Primary outcome was time to achievement of the therapeutic goal. Secondary outcome variables were agent failure rate, change in SBP/DBP over time, uterine output, and adverse effects. Data were analyzed by unpaired t-test, Mann-Whitney U-test, and ANOVA for repeated measures.

RESULTS: Mean time to achieve BP goal was significantly shorter with nifedipine, 25±13.6 (X±SD), than with labetalol 43±25.4 minutes (p=0.002). No patients required crossover therapy. Both agents demonstrated a significant decrease in enrollment SBP and DBP within 1 hour. Urine output was significantly increased (p<0.001) at one hour after nifedipine (99±99 cc) (X±SD) compared to labetalol (44±8±19.1 cc) and remained significantly increased at 2, 6, 12, 18, and 24 hours after initial administration. Adverse effects were rare. There were no significant differences in maternal age, gestational age, number of antepartum patients, and enrollment blood pressure between groups.

CONCLUSIONS: Oral nifedipine and IV labetalol are effective for the acute management of HEP; however, nifedipine controls hypertension more rapidly and is associated with a significant increase in uterine output.
A RANDOMIZED TRIAL OF CONJUGATED IA GROUP B STREPTOCOCCAL VACCINE IN A RAT MODEL OF ASCENDING INFECTION. JK Davies, S Lee, J Eskens, S Woodcock, RS McDuffie, LC Paolleti, RS Gibbs. Dept. of Ob/Gyn, Univ. of Colorado, Denver, CO and Dept. of Medicine, Channing Laboratory, Boston, MA.

OBJECTIVE: Maternal vaccination may become a central strategy in the prevention of early onset neonatal Group B streptococcal (GBS) sepsis. Unlike earlier GBS polysaccharide vaccines which were poorly immunogenic, the newer GBS vaccine has been conjugated to tetanus toxoid (TT) and is significantly more immunogenic. We sought to evaluate a vaccine conjugated to tetanus toxoid using our rat model of ascending infection.

STUDY DESIGN: Rabbit does were randomly assigned to receive either GBS type Ia (Ia-TT) or control, GBS type III (III-TT) vaccine. Does were vaccinated 7 days prior to conception, and 7 and 21 days after conception. Does were mated on three successive days. On days 28-30 (of 30 day gestation), does were endoscopically inoculated intracervically with 10^7 cfu type Ia GB. Labor was induced if does were undelivered after 72 hours. Does were observed for 5-7 d. Pups were observed for ≤ 36 h. We obtained cultures of maternal fluids from uterus, peritoneum, and blood and neonatal cultures from mouth, anus and blood. Serum antibody levels were also obtained. Assuming a 90% reduction in incidence of infection in vaccinated animals, 14 animals per arm would be needed to demonstrate statistical significance.

RESULTS: Pup survival was significantly better in the group receiving Ia-TT (p<0.047). Several other outcomes of interest, although not reaching statistical significance, showed a trend towards improved outcomes in the Ia-TT group.

CONCLUSIONS: This is the first study to evaluate conjugated GBS vaccine using a model of ascending infection. Although Ia-TT vaccine led to improved survival, the vaccine fell short of its expected efficacy with respect to prevention of GBS disease under our experimental conditions. Supported in part by NIH Contract #A125152.

35 THE EFFECTS OF REPEATED DOSES OF ANTENATAL CORTICOSTEROIDS ON MATERNAL ADRENAL FUNCTION. DS McKenna, GM Wither, P Samuels. Department of Obstetrics and Gynecology, The Ohio State University, Columbus, OH.

OBJECTIVE: To determine if multiple courses of maternal antenatal steroids, given to enhance fetal lung maturity result in suppression of the maternal pituitary-adrenal axis.

STUDY DESIGN: The standard low dose adrenocorticotropic hormone (ACTH) stimulation test (0.5 ng intravenously), a very sensitive test for adrenal insufficiency, was administered to 10 pregnant women (mean gestational age 30.2 weeks) who had received at least 2 weekly courses of antenatal betamethasone and also to 6 pregnant controls (mean gestational age of 31.4 weeks) who had not received steroids. The baseline levels and kinetics of maternal serum cortisol (μg/ml) were compared between the two groups.

RESULTS: Mean baseline cortisol was significantly depressed in women who received betamethasone compared to controls (1.9±1.5 vs 26.5±6.2, P<0.001). At each time point after ACTH stimulation, mean cortisol was again significantly lower in women who had received betamethasone (P<0.001). The time to peak cortisol level was significantly delayed in women who had received betamethasone compared to controls (351.6 vs 217±2.7 minutes, P<0.001).

CONCLUSION: The administration of multiple courses of antenatal betamethasone results in barely detectable maternal serum cortisol levels and a diminished response to ACTH stimulation, indicative of decreased steroid stores and adrenal cortical atrophy. This has potentially serious maternal ramifications. Repeated courses of antenatal steroids have not been shown to increase efficacy over a single course in accelerating fetal lung maturity and should be reserved for those women who are at the highest risk for preterm delivery.


OBJECTIVE: Human and ovine fetuses demonstrate an enhanced rate of swallowing, an activity critical for gastrointestinal development and amniotic fluid regulation. Fetal swallowing may be modulated by both systemic and central factors. Nitric oxide (NO) is a central neuromodulator and is significantly involved in systemic and central factors. Nitric oxide (NO) is a central neuromodulator and is significantly involved in systemic and central factors. Nitric oxide (NO) is a central neuromodulator and is significantly involved in systemic and central factors.

STUDY DESIGN: Six time-dated pregnant ewes with singleton fetuses at 140±30 days gestation (levalbuterol) were randomly assigned to receive either 1 μg/kg/min infusion of L-Arginine (NO precursor, to reverse effects of L-NAME). All fetuses received an additional injection of L-NAME (NO synthase inhibitor). Following 2 h, fetuses received an IV injection of L-Arginine (NO precursor, to reverse effects of L-NAME). All fetuses received an additional injection of L-NAME (NO synthase inhibitor). Following 2 h, fetuses received an IV injection of L-Arginine (NO precursor, to reverse effects of L-NAME). All fetuses received an additional injection of L-NAME (NO synthase inhibitor). Following 2 h, fetuses received an IV injection of L-Arginine (NO precursor, to reverse effects of L-NAME). All fetuses received an additional injection of L-NAME (NO synthase inhibitor). Following 2 h, fetuses received an IV injection of L-Arginine (NO precursor, to reverse effects of L-NAME).

RESULTS: Suppression of central NO with L-NAME injection significantly reduced mean (±SEM) spontaneous fetal swallowing (1.27±0.1 to 0.56±0.1 swallows/min low voltage ECoG, P<0.001). Restoration of central NO by L-Arginine injection significantly increased fetal swallowing to pre-L-NAME levels (1.24±0.2 swallows/min low voltage). There were no changes in fetal ECoG activity, blood pressure, plasma osmolality or electrolytes during the study. Fetal swallowing did not change during the study.

CONCLUSIONS: NO is an important neuromodulator of fetal swallowing activity. Elevated fetal central NO synthase activity may contribute to the marked levels of fetal swallowing and the regulation of amniotic fluid volume.
ORAL CONCURRENT SESSION C

Hypertension
Maternal-Fetal Physiology

Friday, January 22, 1999
1:00 pm - 3:30 pm

Moderators: James N. Martin, Jr., MD
Daniel F. O'Keeffe, MD

Judges: Linda J. Heffner, MD
William F. Rayburn, MD
James M. Roberts, MD

Continental Ballroom 1-4
Abstract Numbers 37-46

OBJECTIVE: To evaluate the effects of epidural analgesia during labor on the course of pregnancy-induced hypertension.

STUDY DESIGN: Randomized controlled trial of bupivacaine epidural analgesia compared to patient-controlled (pump) intravenous meperidine in women with term pregnancies in either spontaneous or induced labor and without new onset BP > 140/90 mmHg. All women enrolled received magnesium sulfate for eclampsia prophylaxis.

RESULTS: A total of 738 women were randomized; analysis was intent-to-treat.

Epidual Meperidine P value

| No. women | 372 | 366 | 0.62 |
| Severe preeclampsia | 92 (25) | 76 (21) | 0.06 |

Developed after analgesia:

- BP ≥ 160/110: 8 (2.2%) vs 7 (1.9%), p = 0.2
- AST > 100 U/L: 5 (1.3%) vs 7 (1.9%), p = 0.54
- Δ MAP (mmHg): -25 vs -15, p < 0.001

Ephedrine for hypotension

- 40 (11) vs 0, p < 0.001

IV fluids after analgesia (ml)

- 1525 ± 859 vs 954 ± 774, p = 0.001

Cesarean for fetal distress

- 15 (4) vs 7 (2), p = 0.09

* All data shown as n (%) or means±SD

There was no difference in neonatal or maternal postpartum outcomes.

CONCLUSIONS: Epidural analgesia, although an effective method of labor pain relief, should not be considered a therapy in the management of pregnancy-induced hypertension. A consistent hypotensive effect is associated with a significant rate of ephedrine requirement.


OBJECTIVE: To investigate the efficacy of a short course of furosemide in patients with preeclampsia to shorten recovery, reduce the need for antihypertensive therapy and prevent puerperal cardiopulmonary complications related to cardiogenic pulmonary edema.

STUDY DESIGN: Prospective, randomized clinical trial involving 266 patients with some form of preeclampsia who received either daily furosemide therapy (20 mg/d) with potassium (20 meq/d) for five consecutive days postpartum or no medication following discontinuation of MgSO4 therapy and spontaneous onset of diuresis.

Need for antihypertensive therapy at hospital discharge and pregnancy outcomes were compared.

RESULTS: Study participants had mild preeclampsia (MPE; n = 171), severe preeclampsia with/without HELLP syndrome (SPE; n = 70), or severe preeclampsia with/without HELLP syndrome (SPE; n = 70), or antihypertensive therapy at hospital discharge and pregnancy outcomes with new onset BP > 140/90 mmHg. All women enrolled received magnesium sulfate for eclampsia prophylaxis.

As a beta blocker, labetalol (LAB) in preeclamptic hypertensive urgencies (HUP). NIFEDIPINE RANDOMIZED DOUBLE-BLINDED HEMODYNAMIC STUDY OF OPAL and IV labetalol (LAB) in preeclamptic hypertensive urgencies (HUP).

DESIGN: Randomized double-blind evaluation in preeclampsia which were given either nifedipine (NIF) or labetalol (LAB) and placebo to patients receiving both tablet and IV solution. As part of the randomized study, hemodynamic evaluation by bioimpedance was performed in patients at availability of primary author. Hemodynamic parameters (MAP) at time of dosing, 15 min, 30 min, 60 min, 120 min were recorded. Outcome measures included cardiac index (CI), systemic vascular resistance index (SVRI), mean arterial pressure (MAP), and heart rate (HR). Data (X±SD) were analyzed by analysis of variance for repeated measures (ANOVA/RM) with Bonferroni post test. Mann-Whitney U and Chi-square with Yates correction. Significance was set at P<0.05.

RESULTS: At dosing NIF group (n=6) had CI of 3.08 L/min·m2 (~7% and 50% respectively for this population. Among patients with PE the BA and A~ genotypes frequencies were 32% and 4%. Those without PE had frequencies of 11% and 0.4%. The odds of developing PE when an A allele was present on at least one chromosome was 4.3 (CI 1.3-11.85, p<0.05). Conclusion coefficients for BP and gestational age (GA) were positive. The relationship between BP and GA did not depend on genotype (Figures). CONCLUSIONS: These data indicate the I-4 expanded A allele of NOS3 is associated with PE. The A allele is not associated with a more severe hypertensive phenotype among patients with PE.

THE EFFICACY OF NIFEDIPINE AND LABETALOL IN PREGNANCY-INDUCED HYPERTENSION. Scardro JF, Vermillion ST, Newman RB, Chahan SP, Brot JR, Spartanburg Regional Medical Center, Spartanburg, SC and Medical University of South Carolina. Charleston, SC.

OBJECTIVE: Compare hemodynamic effects of oral nifedipine (NIF) and IV labetalol (LAB) in preeclamptic hypertensive urgencies (HUP).

STUDY DESIGN: Patients with (n=35) and without (n=32) PE were genotyped with respect to the I-4 polymorphism. PCR was used to score patients as BB, BA, or AA. Genotype/phenotype correlations were tested.

RESULTS: Overall the B allele and A allele were observed on 84% and 16% of chromosomes respectively. Using Hardy-Weinberg equilibrium we predicted the BA and AA genotypes occur with a frequency of 7% and 2% respectively for this population. Among patients with PE the BA and AA genotype frequencies were 32% and 4%. Those without PE had frequencies of 11% and 4%. The odds of developing PE when an A allele was present on at least one chromosome was 4.3 (CI 1.3-11.85, p<0.05). Correlation coefficients for BP and gestational age (GA) were positive. The relationship between BP and GA did not depend on genotype (Figures). CONCLUSIONS: These data indicate the I-4 expanded A allele of NOS3 is associated with PE. The A allele is not associated with a more severe hypertensive phenotype among patients with PE.
41 TRANSGENIC DOPPLER ULTRASOUND OF THE UTEROPLACENTAL CIRCULATION IN THE EARLY PREDICTION OF PRE-ECLAMPSIA AND FETAL GROWTH RESTRICTION. I. Thaler*, A. Amii, J. Isokovitz-Eldor*. Department of Obstetrics and Gynecology, Rambam Medical Center, Haifa, Israel.

OBJECTIVE: The failure of the normal process of trophoblastic implantation during the first half of pregnancy is associated with the later development of pre-eclampsia and the delivery of a small for gestational age baby. As the first wave of trophoblastic invasion is completed by the end of the first trimester, we aimed to determine whether Doppler measurements obtained from the uterine arteries between 10-12 weeks of gestation correlate with the subsequent development of those pregnancy complications.

STUDY DESIGN: A follow-up study was carried out in 92 women with singleton pregnancies who had transvaginal uterine Doppler examinations performed at 10-12 weeks' gestation. Flow velocity waveforms were obtained from both of the uterine arteries on both sides. The presence or absence of an early diastolic notch and the ratio between peak systolic to end-diastolic flow velocity (S/D) were calculated. The main outcome measures were pre-eclampsia and birth weight.

RESULTS: There were 16 women with an early diastolic notch in both uterine arteries and 10 (76.9%) subsequently developed pre-eclampsia or delivered a small-for-gestational-age (SGA) baby (<10 percentile). Of the remaining 79 women who did not have bilateral notching only 5 (6.3%) had such complications. When bilateral notching was present, mean S/D (5.8±1.38) was significantly higher than in its absence (4.4±1.54, p<0.02). This test carries a sensitivity of 66.7%, a specificity of 96.1% and a positive predictive value of 76.9%.

CONCLUSION: When bilateral notching of the uterine artery waveforms is detected at 10-12 weeks' gestation, the relative risk for pre-eclampsia or SGA is 12 and for pre-eclampsia alone is 7. This may reflect a failure of the normal process of trophoblastic implantation leading to a deficient nutritional transformation of the uterine arteries into dilated placental vessels. Such patients may be offered early preventative treatments with increased likelihood for a successful outcome.


OBJECTIVE: Prior studies have suggested that sex steroid hormones modulate blood pressure during pregnancy. Our aim was to investigate the effects of the sex steroids, progesterone and 17β-estradiol (E2) on blood pressure and fetal weights in a rat model of preeclampsia induced by chronic nitric oxide (NO) deficiency.

STUDY DESIGN: Osmotic minipumps were inserted subcutaneously into timed pregnant Spraque-Dawley rats on day 10 of pregnancy (term 22 days). The pumps were loaded to continuously deliver either vehicle (CTR group), or L-NAME 50mg/day alone (LN group). Rats were then treated with daily injection (s.c.) Of progesterone 2mg (P group), 17β-estradiol 2ug (E2 group), 17β-estradiol 2ug and progesterone 2mg (E2P group), 17β-estradiol 2ug and N-methyl-d-aspartate 0.5mg (DHT group) or combinations with L-NAME (L+N steroids groups). Systolic blood pressure (BP) was measured with the tail-cuff method before pump insertion and then daily until day 20 of gestation. All rats were sacrificed on day 20 of gestation and the pups weighed.

RESULTS: Systolic BPs were stable at 120 mmHg in the control group. After L-NAME infusion, the BP immediately increased and reached values about 160 mmHg in day 16 or 17, followed by a decline on day 20. Treatment with P, E2, Nog or DHT alone had no significant effect on BP or pup weight compared with control. In rats treated with L-NAME, all steroids significantly (p<0.05) decreased the BP by about 20 mmHg. L-NAME significantly decreased the pup weights (p<0.05). P, Nog and DHT had no effect on fetal weights in L-NAME treated rats. However, E2 significantly lowered the weights in L-NAME treated rats (p<0.05) compared to the control and L-NAME treated rats (Fig ure).

CONCLUSIONS: Sex steroids reverse the effect of chronic nitric oxide deficiency on BP. Except for E2, this decrease in blood pressure does not seem to affect fetal weights and, by extension, uterine perfusion.

43 NEONATAL OUTCOME IN WOMEN WITH SEVERE PREECLAMPSIA OR ECLAMPSIA BETWEEN 24 AND 33 WEEKS. AG Watm, G Saade, FM Matar*, BM Siabi, Dept. OB/GYN, University of Texas Medical Branch at Galveston, TX and University of Tennessee, Memphis, TN.

OBJECTIVE: To characterize the neonatal outcome in women with severe pre-eclampsia or eclampsia delivered prematurely.

STUDY DESIGN: Perinatal data was collected prospectively from 195 consecutively managed pregnancies delivered between 24 to 33 weeks for severe pre-eclampsia or eclampsia. Multiple logistic regression was performed for the dependent outcome variables of survival and RDS using the independent fetal variables of gestational age (GA) at delivery, birthweight, IUGR, steroid use, IVH, composite neonatal morbidity and maternal variables of mean arterial pressure (MAP), diastolic BP, systolic BP, proteinuria, eclampsia, abruption, and cesarean section (CS). The association between RDS and steroids, RDS and CS, survival and IUGR was subjected to univariate chi-square analysis. p<0.05 was considered significant.

RESULTS: After controlling in the multivariate analysis, RDS was inversely related to GA at delivery (p=0.0018) and directly related to CS (p=0.02), while survival was directly related to birthweight (p=0.00025) and inversely related to IUGR (p=0.0058). Overall neonatal mortality was 8.2% (15/185). Only 3 neonatal deaths occurred with birthweight <1000g. There was no correlation on multivariate analysis between RDS or survival and steroid use, IVH, composite neonatal morbidity, MAP, proteinuria, eclampsia or abruption or a 5% or 10% maternal disease as reflected by MAP, prematurity, small placental vessels, or proteinuria. There was no correlation with any neonatal outcome variable. In the univariate analysis, a positive association was observed between RDS and CS (OR 7.19, 95% CI 2.91,18.32) and no correlation was observed between RDS and steroid use (OR 1.08, 95% CI 0.54-2.14). IUGR increased mortality in both the multivariate, p=0.038, (OR 13.2, 95% CI 1.16-151.8) and univariate analysis, p=0.001, (OR 5.88, 95% CI 1.81,19.2).

CONCLUSION: Reduction in RDS correlated with increasing GA. Survival directly correlated with increasing birthweight. The presence of IUGR adversely affected survival independently of other variables. Neonatal outcome was not improved by the use of steroids. We speculate that the mechanism of action of steroids in women with indicated delivery for severe preeclampsia differs from that in spontaneous preterm delivery for PTL or PROM. IUGR was not protective for development of RDS. Presumed intrauterine stress as reflected by the severity of maternal disease did not impact on neonatal outcome.


OBJECTIVE: To quantify the relative contributions of alcohol-related growth restriction and decreased gestational duration to lowered birth weight (BWT) on a sample of gravidas using for the first time a causal model which adjusts aggressively for maternal characteristics to isolate the impact of alcohol.

STUDY DESIGN: Live born infants of 3,363 African-American mothers enrolled in a large prospective study of alcohol consumption in pregnancy were examined. The sample included only women with an U/S supported gestational age. Path analysis was performed on the first of a planned split-squares sample of 1415 mothers. Maternal characteristics were age, pre-pregnancy weight, parity, and socio-economic status. Infant gender was also included. Substance use included smoking & cocaine use. The independent variable was drinking frequency as measured by proportion drinking days across pregnancy. Dependent variables were gestational age (UGA), fetal growth and BWT.

RESULTS: At the 95% female, the frequency of drinking (2 days/wk) decreased BWT nearly 200 grams, compared with abstainers. This was accounted for by decreased pregnancy duration of 4 days, which resulted in a 90 gram reduction and a 97 gram reduction due to growth restriction.

CONCLUSIONS: This is the first time that attributable risk has been appropriately apportioned between these two causes of alcohol-related reduced BWT. Controlling for maternal characteristics, cocaine and smoking, alcohol was found to shorten gestation and restrict fetal growth. The effect sizes of the two on BWT are about equal. The impact of alcohol on reducing gestational duration has been underestimated and that of growth overestimated.
45 NEONATAL NUCLEATED RED BLOOD CELL COUNTS OF GROWTH RESTRICTED FETUSES - RELATIONSHIP TO ARTERIAL AND VENOUS DOPPLER STUDIES


OBJECTIVE: To determine the relationship between the nucleated red blood cell (NRBC) count at birth and the circulatory status of fetuses with growth restriction (IUGR).

METHODS: Serial Doppler was performed in 84 IUGR fetuses with an umbilical artery (UA) pulsatility index (PI) >2SD above the mean for gestational age and a birthweight <10th centile for gestational age. UA and umbilical artery (UA) pulsatility index (PI) >2SD above the mean for gestational age, 3 = PVIV >2SD above the mean for gestational age and/or pulsatile flow velocity waveform in the UV. The number of NRBCs/100 white blood cells (WBC) was ascertained in a peripheral blood sample obtained within two hours of birth with daily subsequent samples until the NRBC count was below 5/100 WBC.

RESULTS: The table shows the significant increase in NRBC count and slower decline in groups 2 and 3 compared to group 1. Neonates in group 3 also had the lowest platelet count, hemoglobin and hematocrit. Multiple regression revealed the umbilical cord artery bicarbonate as the single significant independent determinant of the NRBC count and the rate of decline (p<0.00001, r²=0.27 and 0.47 respectively).

CONCLUSION: Deterioration of arterial and venous flows in IUGR fetuses is associated with a rise in the NRBC count. Metabolic acidemia rather than altered PO2 associated with this circulatory state appears to be the main determinant of the NRBC count.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>NRBC count/100 wbc</td>
<td>mean (+SD)</td>
<td>mean (+SD)</td>
<td>mean (+SD)</td>
</tr>
<tr>
<td></td>
<td>28 (+48.5)</td>
<td>61.3 (+68.7)</td>
<td>406.6 (+548.3)</td>
</tr>
<tr>
<td>Days until NRBC&lt;5/100 wbc</td>
<td>mean (+SD)</td>
<td>mean (+SD)</td>
<td>mean (+SD)</td>
</tr>
<tr>
<td></td>
<td>1.9 (+1.5)</td>
<td>2.9 (+1.5)</td>
<td>4.7 (+3.5)</td>
</tr>
<tr>
<td>Platelet count (x1000)</td>
<td>mean (+SD)</td>
<td>mean (+SD)</td>
<td>mean (+SD)</td>
</tr>
<tr>
<td></td>
<td>233.6 (+87.9)</td>
<td>190.9 (+81.3)</td>
<td>162.4 (+91.2)</td>
</tr>
<tr>
<td>Hemoglobin (mg/dl)</td>
<td>mean (+SD)</td>
<td>mean (+SD)</td>
<td>mean (+SD)</td>
</tr>
<tr>
<td></td>
<td>17.2 (+1.9)</td>
<td>16.3 (+2.3)</td>
<td>15.4 (+2.6)</td>
</tr>
<tr>
<td>Hematocrit (%)</td>
<td>mean (+SD)</td>
<td>mean (+SD)</td>
<td>mean (+SD)</td>
</tr>
<tr>
<td></td>
<td>54.3 (+62.2)</td>
<td>51.6 (+48.4)</td>
<td>49.3 (+38.6)</td>
</tr>
<tr>
<td>WBC count (x1000)</td>
<td>mean (+SD)</td>
<td>mean (+SD)</td>
<td>mean (+SD)</td>
</tr>
<tr>
<td></td>
<td>9.8 (+5.8)</td>
<td>9.5 (+2.9)</td>
<td>9.7 (+5.9)</td>
</tr>
</tbody>
</table>

legend: †p<0.05 vs. group 1, ‡p<0.0005 vs. group 1, ¥<0.05 vs. group 2

CONCLUSION: Deterioration of arterial and venous flows in IUGR fetuses is associated with a rise in the NRBC count. Metabolic acidemia rather than altered PO2 associated with this circulatory state appears to be the main determinant of the NRBC count.

46 MAIN SPLENIC ARTERY PEAK SYSTOLIC VELOCITY (PSV): A STRONG PREDICTOR OF SEVERE FETAL ANEMIA DUE TO RH-ALLOIMMUNIZATION

R Bahado-Singh, U Oz, E Kovatchi, CD Hsu, L Onderoglu, J Copel, GMI Dept. OB/GYN, Yale School of Medicine, New Haven, CT.

OBJECTIVE: To determine whether the main splenic artery Doppler PSV predicts severe anemia in the Rh-alloimmunized fetus.

STUDY DESIGN: Doppler velocimetry of the main splenic artery was obtained prospectively prior to cordocentesis in Rh-disease. The PSV from at least 3 consecutive waveforms were averaged. Normative values for mean PSV based on gestational age was obtained from a non-alloimmunized population. The PSV values in the study group was expressed as multiples of the median (MoM) and threshold values were used as a screening test for the detection of severe anemia. The Hb deficit (ΔHb) was defined as the difference between the measured Hb and the mean Hb for gestational age and/or pulsatile flow velocity waveform in the UV. The number of NRBCs/100 white blood cells (WBC) was ascertained in a peripheral blood sample obtained within two hours of birth with daily subsequent samples until the NRBC count was below 5/100 WBC.

RESULTS: The study population consisted of 26 singleton non-hydropic fetuses in which cordocentesis was performed on 55 occasions. The mean gestational age (SD) at cordocentesis was 29.6 (4.0) weeks. Severe anemia was noted in 20% of occasions. Based on an ROC curve, a PSV threshold value of ≥1.4 MoM had a detection rate of 100% with a false positive rate of 20.8%, in the subgroup with no prior transfusion. A PSV threshold ≥1.3 MoM corresponding values were 100% and 25% for cases with one prior transfusion. Identical detection and false positive rates were obtained using the same threshold ≥1.3 MoM in the overall study population. There was no risk of severe anemia with a PSV < the mean for gestation.

CONCLUSION: Fetal hydrops is rare with a ΔHb <5 g/dl. In the first trimester, the main splenic artery PSV was a strong predictor of severe anemia. All such cases could be diagnosed while performing cordocenteses in only 25% of fetuses. There was no risk of severe anemia and significantly reduced risk of any degree of anemia with a Doppler PSV above the mean for gestation. This measurement is easily obtained and should be investigated as a clinical tool for minimizing the need of cordocenteses.
OEAL CONCURRENT SESSION D

Clinical Obstetrics

Friday, January 22, 1999
1:00 pm - 3:30 pm

Moderators: Haywood L. Brown, MD
Dale P. Reisner, MD

Judges: Gian Carlo DiRenzo, MD
John T. Repke, MD
James A. Thorp, MD

Continental Ballroom 6-9
Abstract Numbers 47-56
47  **IS MECONIUM-STAINED AMNIOTIC FLUID INFECTIOUS MORBIDITY REDUCED BY PROPHYLACTIC AMpicillin sulbactam?**

**OBJECTIVE:** To evaluate intrapartum prophylactic ampicillin sulbactam in reducing intra-amniotic infection (IAI) in patients with meconium stained amniotic fluid (MSAF).

**METHODS:** Patients with intrapartum diagnosis of MSAF were randomized to either one dose of ampicillin sulbactam 3 grams IV or matching normal saline. Inclusion criteria included absence of obvious infection, temperature <100°F, MSAF passage, and willingness to participate. Exclusion criteria included fetal heart rate >180, penicillin or Cephalosporin allergy. All patients participated as volunteers in this IRB approved study. Statistical analysis included X2, t-test, and relative risk with 95% confidence interval as appropriate. P < 0.05 was considered significant.

**RESULTS:** The study was conducted from 7/96 to 3/98. There were 347 deliveries during this interval, of which 9.8% were complicated by MSAF passage. 242 patients were randomized.

<table>
<thead>
<tr>
<th>Amp Sub</th>
<th>Placebo</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>24.88 ± 3.73</td>
<td>23.44 ± 3.45</td>
</tr>
<tr>
<td>Primigravida</td>
<td>35 (25.5%)</td>
<td>46 (36.7%)</td>
</tr>
<tr>
<td>Nulliparous</td>
<td>35 (30.9%)</td>
<td>52 (45.7%)</td>
</tr>
<tr>
<td>Race</td>
<td>Black 112 (91.1%)</td>
<td>98 (82.4%)</td>
</tr>
<tr>
<td>White</td>
<td>11 (8.9%)</td>
<td>11 (8.7%)</td>
</tr>
<tr>
<td>Induction</td>
<td>18 (14.6%)</td>
<td>27 (22.7%)</td>
</tr>
<tr>
<td>Gestational Age (W)</td>
<td>39.88 ± 1.97</td>
<td>39.85 ± 1.16</td>
</tr>
<tr>
<td>Vaginal Exams</td>
<td>6.32 ± 2.58</td>
<td>6.15 ± 2.37</td>
</tr>
<tr>
<td>ROM (Minutes)</td>
<td>43.39 ± 57.28</td>
<td>45.07 ± 274.38</td>
</tr>
<tr>
<td>Labor (Minutes)</td>
<td>590.85 ± 280.49</td>
<td>563.03 ± 925.72</td>
</tr>
<tr>
<td>Episiotomy</td>
<td>97 (78.9%)</td>
<td>102 (85.7%)</td>
</tr>
<tr>
<td>Oxytocin Use</td>
<td>65 (52.8%)</td>
<td>68 (56.2%)</td>
</tr>
<tr>
<td>IPPC</td>
<td>36 (28.5%)</td>
<td>29 (23.4%)</td>
</tr>
<tr>
<td>Vaginal Delivery</td>
<td>86 (69.9%)</td>
<td>75 (60.8%)</td>
</tr>
<tr>
<td>IAP</td>
<td>103 (83.7%)</td>
<td>97 (81.0%)</td>
</tr>
<tr>
<td>IAP*</td>
<td>12 (9.8%)</td>
<td>29 (24.4%)</td>
</tr>
</tbody>
</table>

* RR=0.53 CI 0.32, 0.86

**CONCLUSION:** Ampicillin sulbactam reduced by approximately 50% the incidence of IAI in cases complicated by meconium amniotic fluid staining.

48  **ADVANCED CERVICAL DILATION AND TOCOLOYSIS.**

**OBJECTIVE:** To assess the maternal/perinatal outcome of tocolysis on patients dilated >3 cm with preterm labor (PTL).

**STUDY DESIGN:** 257 mothers with intact membranes & PTL at >_3 cm and preterm labor (PTL) were studied. Exclusion criteria included PROM, <24 & >36 wks., placental abruption, preeclampsia, hypertension, and IUGR. Data presented as medians unless otherwise specified.

**RESULTS:** There were no differences between groups in regards to GA and birth weight (BW). 8% had multi-nerve transfers, 9% with prenatal care, 19% with twin gestation, 37% smokers, 8% drug abusers, 42% of multiparas had a prior preterm birth. 21 patients at 3cm and 7 patients at 4cm were discharged undelivered after at least 48 hours. 229 patients delivered at our center. Delivery Delay vs. Tocolysis (N=229) p < 0.001

<table>
<thead>
<tr>
<th>Time to Del (hrs)</th>
<th>3cm (n=24)</th>
<th>4cm (n=74)</th>
<th>5cm (n=53)</th>
<th>6cm or more (n=52)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;168</td>
<td>17 (21)</td>
<td>8 (11)</td>
<td>1 (1)</td>
<td>0</td>
</tr>
<tr>
<td>&gt;6 &amp; ≤168</td>
<td>36 (42)</td>
<td>26 (35)</td>
<td>10 (16)</td>
<td>6 (19)</td>
</tr>
<tr>
<td>&gt;2 &amp; ≤4</td>
<td>20 (12)</td>
<td>18 (24)</td>
<td>5 (13)</td>
<td>4 (12)</td>
</tr>
<tr>
<td>≤2</td>
<td>10 (12)</td>
<td>18 (24)</td>
<td>16 (41)</td>
<td>22 (69)</td>
</tr>
</tbody>
</table>

89% had no tocolytic side effects, 6% pulmonary edema, 16% chest pain. All responded well to changes in tocolysis and RX. 8% had chorioamnionitis. Inclusion criteria included absence of obvious infection, temperature <100°F, MSAF passage, and willingness to participate. Exclusion criteria included fetal heart rate >180, penicillin or Cephalosporin allergy. All patients participated as volunteers in this IRB approved study. Statistical analysis included X2, t-test, and relative risk with 95% confidence interval as appropriate. P < 0.05 was considered significant.

**CONCLUSION:** Tocolytic agents are effective in reducing IAI in cases complicated by meconium amniotic fluid staining.

50  **EFFECTIVENESS OF ANTENATAL STEROIDS IN MULTIPLE GESTATION**

**OBJECTIVE:** The purpose of this study was to determine the effectiveness of antenatal steroids in the reduction of neonatal morbidity and mortality in the multiple gestation.

**STUDY DESIGN:** Twins and triplets (MG) weighing <1500g delivered between January, 1990 and July 1997 were entered into the study. The study population was stratified according to antenatal steroid (ANS) exposure and compared for respiratory distress syndrome (RDS), intraventricular hemorrhage (IVH) and periventricular leukomalacia (PVL), major lesions (grades 3 and 4 IVH, IVH/PVL, PVL) necrotizing enterocolitis (NEC), patent ductus arteriosus (PDA) and proven neonatal sepsis and neonatal death. The two groups were also compared for gestational age at delivery, BW, birthweight (BW), mortality rate (MR), perinatal morbidity (PM), intensive care unit (ICU) survival rate (ICUSR), NICU survival rate (NICU), ventilator days (VD) and hospital stay (HST). Student T-test, Chi-square and Fisher exact test were used for analysis.

**RESULTS:** There were no differences between groups with regards to GA, BW, PM, and NICU survival. A comparison of groups with regards to neonatal morbidity shows:

<table>
<thead>
<tr>
<th>INDEX</th>
<th>MG + ANS</th>
<th>MG - ANS</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>95</td>
<td>151</td>
</tr>
<tr>
<td>RDS</td>
<td>27 (39.7%)</td>
<td>77 (50.9%)</td>
</tr>
<tr>
<td>IVH/PVL</td>
<td>27 (28%)</td>
<td>48 (31.9%)</td>
</tr>
<tr>
<td>Major brain lesions</td>
<td>52 (32%)</td>
<td>29 (37.3%)</td>
</tr>
<tr>
<td>NEC</td>
<td>1 (0.5%)</td>
<td>10 (6.5%)</td>
</tr>
<tr>
<td>Neonatal sepsis</td>
<td>12 (12.6%)</td>
<td>16 (10.5%)</td>
</tr>
<tr>
<td>Neonatal death</td>
<td>5 (5.2%)</td>
<td>23 (15.2%)</td>
</tr>
</tbody>
</table>

**CONCLUSION:** Antenatal steroids significantly decrease the incidence of RDS, major brain lesions, NEC and neonatal death in multiple gestation.
51 DOES SALVAGE CERVICAL PREVENT PRETERM DELIVERY IN PATIENTS WITH SONOGRAPHIC CERVICAL SHORTENING AND/OR FUNNELING?

V. Bergella, S. Daly, J.E. Tolou, M. DiVito, R.J. Wapner. Division of Maternal Fetal Medicine, Department of Ob/Gyn, Jefferson Medical College of Thomas Jefferson University, Philadelphia, PA.

OBJECTIVE: To determine if salvage cerclage reduces the incidence of preterm delivery (PTD) in asymptomatic patients identified by transvaginal ultrasound (TVS) to have a short cervix and/or funneling before 24 weeks gestational age (GA).

STUDY DESIGN: Singleton pregnancies at risk for PTD were followed prospectively with TVS from 14 to 23 weeks' GA from 6/95 to 6/98, and included in the study if they had cervical length <25mm and/or funneling ≥25%. McDonald salvage cerclage was performed at the discretion of the patient and the obstetrician. Patients with polyhydramnios, severe congenital anomalies, or placenta previa were excluded. The two groups of salvage cerclage (SC) and 'no cerclage' (NC) were compared for the primary outcome (PTD <35 weeks' GA) using Chi Square or Fisher's Exact test for categorical variables and t-test for continuous variables.

RESULTS: Of 66 pregnancies which had cervical length <25mm and/or funneling >25%, 42 received salvage cerclage (SC group) and 24 did not (NC group). These two groups were similar for age, race, parity, private or clinic care, smoking, history of PTD, history of 2 D & Zs, history of cerclage, DES exposure, Mullerian anomalies and cone biopsy. They were also similar for TVS cervical length at time of entry (16.6mm in SC and 18.3mm in NC groups, p=0.5), but dissimilar for mean funneling (47% in SC and 32% in NC groups, p=0.04) and GA at entry (19.5 vs 21.0 weeks' GA in SC and NC groups, respectively, p=0.1). PTD <35 weeks' GA occurred in 16 (38%) pregnancies in the SC group and 5 (21%) in the NC group (RR 1.8, CI 0.84 .4). Incidence of tocolysis and PPROM, GA at delivery (33.9 weeks' GA in SC patients and 32% in NC groups, p=.046) and GA at entry (19.5 vs 21.0 weeks' GA in SC and NC groups, respectively, p=0.01). PTD <35 weeks' GA, and birth weights were also similar in the two groups. When the 24 NC pregnancies were compared with 24 SC pregnancies matched for funneling and GA at entry, incidence of PTD <35 weeks' GA (17% in the matched SC and 21% in the NC pregnancies, RR 1.4, CI 0.5-3.8).

CONCLUSION: Salvage cerclage may not reduce the incidence of PTD in pregnancies identified at risk for this outcome by TVS. This clinical question can be better answered by a randomized trial.

52 CESAREAN DELIVERY DOES NOT DECREASE THE RISK OF INTRAUTERINE HEMORRHAGE IN NEONATES <1500 GM. A. Sussman, L. Leid, D. Paul*, Divisions of Maternal Fetal Medicine and Neonatology, Christiana Hospital, Newark, DE.

OBJECTIVE: While some reports have found a significant decrease in the occurrence and severity of intraventricular hemorrhage (IVH) in the preterm infant who is delivered by cesarean section, the effect of delivery route on the occurrence of IHV in the very low birth weight infant remains controversial. We sought to assess the relationship between mode of delivery in neonates <1500 gm and the incidence of IVH.

STUDY DESIGN: Our neonatal database was reviewed for neonates <1500 g at that had at least one cranial sonogram within four days of delivery. Mode of delivery, IVH grade of IVH, gestational age at delivery, magnesium sulfate (MgSO4) use, steroid use, chorioamnionitis, gender, one of BW categories: SGA (BW (10th percentile) were included in the study. The association between mode of delivery in neonates <1500 gm and the incidence of IVH was assessed using appropriate. A p value <0.05 was considered significant.

RESULTS: In the 674 neonates identified, 293 (43%) were delivered vaginally and 376 (57%) by cesarean delivery. Although infants delivered by cesarean were not significantly more likely to have a grade III or IV IVH (9% vs. 11%, p=NS), neonates delivered by cesarean were less likely to have any IVH (15% vs. 27%, p=0.02). However, infants born by cesarean had a significantly higher gestational age than those born vaginally (28.7 vs. 27.8 weeks, p<0.01). Furthermore, infants born by cesarean were more likely to have mothers with preeclampsia (25% vs. 7.5%, p<0.001), to have oligohydramnios (17% vs. 7%, p=0.008), be a boy, (28% vs. 19%, p=0.007), and less likely to have PROM (25% vs. 49%, p<0.001) and PPROM (16% vs. 27%, p<0.001). There was no statistical difference in maternal steroid use, MgSO4 use, chorioamnionitis, gender, or Apgar scores between the groups. After controlling for gestational age, birth weight and potential confounding variables, cesarean delivery was no longer significantly associated with a decreased risk of IVH (OR= 0.5 (0.3-1.3), p=0.5).

CONCLUSIONS: In our population cesarean delivery did not appear to protect the very low birth weight infant from IVH.

53 ORAL NARCOTIC AND NON-NARCOTIC ANALGESIA AFTER CESAREAN SECTION. P Jakob*, I. Soh*, Z. Wenner*, E.Z. Zimmer. Dept. OB/GYN, Rambam Medical Center, Haifa, Israel

OBJECTIVE: To assess patients' satisfaction receiving oral narcotic and/or non-narcotic analgesia after a cesarean section (CS).

STUDY DESIGN: An open prospective study was conducted for two consecutive periods of 3 months each, on all women who had a C/S with epidural analgesia. No parenteral analgesia was provided after CS. In the first period (period 1), patients were informed to take a solution of 1 gr. Dipyrone (D) every 4 hours. If the patient requested additional analgesia before 4 hours elapsed, she got a tablet of 30 mg morphine sulphate - immediate release (MIR). This protocol enabled patients to receive up to 12 doses of analgesia in the first 24 hours. Women recorded their pain score on a Visual Analog Scale (VAS) prior to the administration of each dose of medication. In the second study period the same protocol of treatment was used however, MIR was the drug of choice and D was administered if supplementary analgesia was requested.

RESULTS: There were 109 women in the D group and 90 in the MIR group. No significant difference was noted between the groups regarding maternal age (29.4 ± 5.2 vs. 29.3 ± 5.7), parity (1.18 ± 1.3 vs. 1.06 ± 1.2), gestational age (38.2 ± 3.7 vs. 37.9 ± 3.3) and emergency C/S rate (61% vs. 68%). In both groups of patients, 76% were Jewish and 30% were Arabic. The satisfaction score was significantly higher in the D group (90 ± 6 vs. 85.7 ± 11.9, p<0.001). Supplementary analgesia was requested more often in the MIR group (55/90 vs. 28/109, p<0.001). Only 1/109 patient from the D group decided to switch over to the MIR protocol while 18/90 patients in the MIR group were unsatisfied and switched over to the D protocol (p<0.001). The mean number of doses of analgesia requested by patients in the first 24 hours did not differ between the D and MIR groups (3.14 ± 1.22 vs. 3.14 ± 1.12).

CONCLUSION: On the average, patients requested only 25% of the permissible dosage of analgesia. Oral Dipyrone provides a satisfactory analgesia after C/S and is superior to MIR. It appears that there are other alternative medications to narcotic analgesia after CS.
55 DIFFERENTIAL EXPRESSION ANALYSIS OF GENES IN LABORING MYOMETRIAL TISSUE. K. Ag'uan, W. Kramer, L. Thompson, C. Weiner. Dept MFM, Univ. of Maryland, Baltimore, MD.

OBJECTIVE: To identify the genes in the myometrial tissue of laboring women that are expressed de novo, up or downregulated.

STUDY DESIGN: Myometrial tissue samples were collected from patients undergoing cesarean section (elective and failure to progress). The tissue was frozen rapidly in liquid N2, mRNA was extracted and cDNAs synthesized and then labeled with [α³²P] dATP. Identical blots (Atlas Blot, Clontech, CA), containing 588 cDNA arrayed genes reported to play key roles in different biological processes, were individually hybridized with equal counts of cDNA probes from non-laboring and laboring women. Blots were autoradiographed and quantitated using a phosphoimager. A change of greater than 100% from nonlaboring was considered significant.

RESULTS: Presented as de novo (D), up (†) and downregulated (~) genes.

<table>
<thead>
<tr>
<th>GeneBank No.</th>
<th>Name of Gene</th>
</tr>
</thead>
<tbody>
<tr>
<td>A00914</td>
<td>Angiotensin Converting Enzyme</td>
</tr>
<tr>
<td>U05875</td>
<td>Interferon γ receptor β chain</td>
</tr>
<tr>
<td>M24645</td>
<td>Monocyte Chemotactic Protein</td>
</tr>
<tr>
<td>U07707</td>
<td>Epidermal growth factor receptor substrate 15</td>
</tr>
<tr>
<td>M29971</td>
<td>Methylated DNA-protein cystein methyltransferase</td>
</tr>
<tr>
<td>X70926</td>
<td>MacMarcks</td>
</tr>
<tr>
<td>M31159</td>
<td>Insulin like growth factor binding protein 3</td>
</tr>
<tr>
<td>X08920</td>
<td>Glutathione S Transferase M4 (Mu 1)</td>
</tr>
<tr>
<td>U01134</td>
<td>VEGF Receptor 1</td>
</tr>
<tr>
<td>X08924</td>
<td>Calgranulin A (Calcium binding protein)</td>
</tr>
<tr>
<td>X59770</td>
<td>Interleukin-1 receptor type II</td>
</tr>
<tr>
<td>X59770</td>
<td>Insulin growth factor II</td>
</tr>
<tr>
<td>U15979</td>
<td>Fetal Antigen I</td>
</tr>
</tbody>
</table>

CONCLUSIONS: High through-put cDNA array identified candidate genes thought to play a role in labor as well as genes not known to be involved. Knowledge of the functional interplay of these genes during labor may enable us to understand the mechanisms involved and help to develop strategies to regulate uterine contractility.

56 RATE OF UTERINE RUPTURE DURING A TRIAL OF LABOR IN WOMEN WITH ONE AND TWO PRIOR CESAREAN DELIVERIES. A. Caughey, T. Shipp, C. Zelop, A. Cohen, E. Lieberman. Dept. Ob/Gyn, Harvard Medical School, Brigham and Women’s Hospital, Massachusetts General Hospital, Boston, MA.

OBJECTIVE: To determine whether there is a difference in rate of symptomatic uterine rupture following a trial of labor (TOL) in women who have had one versus two prior cesarean sections.

STUDY DESIGN: The medical records of all 3891 women with a history of either one or two prior cesarean sections who elected to undergo a TOL during a twelve-year period were reviewed. Rates of uterine rupture were compared for these two groups. Potential confounding was controlled using logistic regression analyses.

RESULTS: There was a significantly higher rate of uterine rupture in the women with two prior cesarean deliveries (p=0.001).

<table>
<thead>
<tr>
<th>Number of Prior CS</th>
<th>Number of Patients</th>
<th>Uterine Rupture (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3727</td>
<td>0.8</td>
</tr>
<tr>
<td>2</td>
<td>134</td>
<td>3.7</td>
</tr>
</tbody>
</table>

In a logistic regression analysis controlling for birthweight, induction, maternal age, prior vaginal delivery, and length of labor, the odds ratio for uterine rupture in those patients with 2 prior cesareans was 4.7 (96% CI =1.8, 12.8).

CONCLUSIONS: Women with a history of two prior cesarean sections have an almost five-fold greater risk of uterine rupture than those with only one prior cesarean delivery. This information can certainly be useful in counseling patients undergoing a subsequent trial of labor after cesarean.
ORAL CONCURRENT SESSION E

Prematurity
Infectious Disease

Saturday, January 23, 1999
8:00 am - 10:30 am

Moderators:    Ronald S. Gibbs, MD
               Jay D. Iams, MD

Judges:        Mara J. Dinsmoor, MD
               Brian M. Mercer, MD
               Jennifer R. Niebyl, MD

Continental Ballroom 1-4
Abstract Numbers 57-66
57 THE IMPACT OF DIGITAL CERVICAL EXAMINATION ON EXPECTANTLY MANAGED PRETERM RUPTURED MEMBRANES J.M. Alexander for the NICHD/MFMU Network, Bethesda, MD.

OBJECTIVE: To examine the effect of digital exam on maternal and neonatal outcomes in women with pROM.

STUDY DESIGN: This analysis includes data from a previously reported trial of antibiotic treatment during expectant management of pROM at 24–32 weeks in singleton and twin gestations. Patients from both the randomized trial (n=299 antibiotic and n=312 placebo patients) and the observational component (n=185) are included in this analysis. The groups were divided into those with no cervical exam (n=606) and those with one (n=161) or two exams (n=27).

RESULTS:

Cervical exams (%) | None | 1 or 2 | P | Value
--- | --- | --- | --- | ---
Gest. age at enrollment, mean (sSD) | 28.5 (2.4) | 28.6 (2.3) | .85 | .45
Chorioamnionitis | 165 (37) | 54 (29) | .69 | 
Endometritis | 67 (11) | 24 (13) | .50 | 
Wound infection | 6 (1) | 1 (5) | 1.0 | 
Infant outcomes: N=640 N=193
Early sepsis | 53 (5) | 11 (6) | .68 | 
RDS | 296 (45) | 66 (50) | .18 | 
IVH | 41 (6) | 14 (7) | .67 | 
NEC | 20 (3) | 10 (5) | .19 | 
Death (stillbirth/postnatal) | 35 (5) | 13 (7) | .45 | 
Composite* | 107 (16) | 106 (55) | .10 | 

*Composite includes sepsis, RDS, IVH, NEC, and death.

Multivariate analysis for study group and group B strep culture status did not modify the above results.

CONCLUSIONS: One or two digital cervical examinations in the course of expectant management of pROM between 24 and 32 weeks gestation did not adversely affect maternal or neonatal outcomes.

58 EVIDENCE FOR DYSREGULATION IN "THE DEATH FACTOR RECEPTOR" *FAS* IN PREMATURE LABOR. E. Maymon, S.S. Edwards, R. Gomez, S. Hauseman, M. Mauc, B.H. Youn, R. Komorn, Prenatology Research Branch, NICHD/NIH, Bethesda, MD and the Department of Obstetrics and Gynecology, Wayne State University/Hutzel Hospital, Detroit, MI.

OBJECTIVE: Preterm labor (PTL) has been considered to have survival implications, and is considered to be an inflammatory disease. We have examined the ligand/receptor system involved in programmed cell death: the Fas-Ligand system.

STUDY DESIGN: Fetal blood sampling was performed in 83 patients with preterm PROM. Amniotic fluid (AF) was cultured for aerobic and anaerobic bacteria as well as mycoplasmas. Fetal plasma interleukin-6 (IL-6) concentration were measured with a sensitive immunoassay. Logistic regression and survival techniques were used for analysis.

RESULTS: 1) Patients with a positive AF culture for microorganisms had significantly higher median fetal plasma IL-6 than those with sterile AF (median 46.7 (7.3-2560) pg/ml vs median 3.5 (0.5-250) pg/ml; p<0.001); 2) Patients who delivered spontaneously within 7 days of the procedure had significantly higher fetal plasma IL-6 than those who remained in utero >7 days (median 9.7 (0.3-250) pg/ml vs median 4.3 (0.248-7.7) pg/ml; p<0.05); and 3) Neonates who developed significant morbidities had a higher median fetal plasma IL-6 than those without neonatal complications (median 12.3 (0.2830) pg/ml vs median 4.4 (0.245-2) pg/ml; p<0.05).

CONCLUSION: Fetuses with microbial invasion of the amniotic cavity, duration of intrauterine stay and fetal plasma IL-6 concentrations were measured with a sensitive immunoassay. Logistic regression and survival techniques were used for analysis.

59 PROSPECTIVE EVALUATION OF PATIENTS AT HIGH RISK FOR PRETERM DELIVERY WITH TRANSVAGINAL ULTRASOUND OF THE CERVIX. R. Benhelfa, R. Chalmers, A. Bhullar, R.J. Wagner, Division of Maternal Fetal Medicine, Department of Obstetrics and Gynecology, Jefferson Medical College of Thomas Jefferson University, Phila., PA.

OBJECTIVE: To determine in high risk patients the sensitivity, specificity, positive and negative predictive value for preterm delivery (PTD) of transvaginal ultrasound (TVS) of the cervix.

CONCLUSIONS: TVS of the cervix at 14 to 25 weeks' gestational age (GA) with TVS of the cervix from 6/95 to 6/98. Exclusion criteria were prophylactic cerclage, placenta previa, and severe congenital anomalies. Cervical length of <25 mm and/or funneling >25% were considered significant TVS cervical changes. The primary outcome was PTD 4<25 weeks' GA. Chi square test was used for statistical analysis.

RESULTS: One hundred thirty-four pregnancies at high risk for PTD were followed, including fifty-one (38%) with ≥2 prior trimester losses, 79 (59%) with ≥1 prior 16-34 weeks PTDs, 52 (24%) with ≥1 prior pD+C, 17 (13%) with a Mullerian anomaly, 14 (10%) with a prior one biopsy, and 11 (8%) with a history of DES exposure. Of 53 (40%) pregnancies identified to have significant TVS cervical changes, 29 (39%) had PTD; of 81 pregnancies in which significant TVS cervical changes were not identified, 5 (6%) had PTD (RR 6.1, CI 2-4.5-3). The sensitivity, positive and negative predictive value of short cervix (<25 mm) and/or funneling >25% were 80%, 70%, 38%, and 95%, respectively.

CONCLUSION: TVS of the cervix at 14 to 25 weeks' GA is an excellent predictor of PTD in high risk pregnancies.


OBJECTIVE: Fetuses with an elevated plasma concentration of interleukin-6 (IL-6) are at risk for impending preterm delivery and perinatal morbidity/mortality (AJOG: 1998:179:186 and 179:194). The purpose of the study was to examine the relationships among the microbiologic state of the amniotic cavity, duration of intrauterine stay and fetal plasma IL-6 concentrations in patients with preterm premature rupture of membranes (PROM).

STUDY DESIGN: Fetal blood sampling was performed in 85 patients with preterm PROM. Amniotic fluid (AF) was cultured for aerobic and anaerobic bacteria as well as mycoplasmas. Fetal plasma IL-6 concentrations were measured with a sensitive immunoassay. Logistic regression and survival techniques were used for analysis.

RESULTS: 1) Patients with a positive AF culture for microorganisms had significantly higher median fetal plasma IL-6 than those with sterile AF (median 46.7 (7.3-2560) pg/ml vs median 3.5 (0.5-2500) pg/ml; p<0.001); 2) Patients who delivered spontaneously within 7 days of the procedure had significantly higher fetal plasma IL-6 than those who remained in utero >7 days (median 9.7 (0.3-250) pg/ml vs median 4.3 (0.248-7.7) pg/ml; p<0.05); and 3) Neonates who developed significant morbidities had a higher median fetal plasma IL-6 than those without neonatal complications (median 12.3 (0.2830) pg/ml vs median 4.4 (0.245-2) pg/ml; p<0.05).

CONCLUSION: Fetuses with microbial invasion of the amniotic cavity and those at risk for impending preterm labor/delivery have evidence of systemic fetal inflammatory response.
61 THE PRETERM PREDICTION STUDY: SEQUENTIAL CERVICAL LENGTH AND FETAL FIBRONECTIN TESTING FOR THE PREDICTION OF SPONTANEOUS PRETERM BIRTH (SPB). E.L. Goldenberg for the NICHD Fetal Medicine Network, Bethesda, MD.

OBJECTIVE(S): To further elucidate the pathogenesis of SPB using traditional and new markers for preterm birth.

STUDY DESIGN: 3076 women (2929 with a singleton and 147 with a twin pregnancy) were categorized by the presence of risk factors (RF) including pre-eclampsia, black race, low body mass index, the presence of bacterial vaginosis (BV) and prior SPB. At 24 and 28 wks, cervical length (CL) was measured and categorized as short (<25 mm) or normal length (>25 mm). Vaginal and cervical fetal fibronectin (FFN) was measured at 24, 26, 28 and 30 wks and categorized as positive (+) (250 ng/ml) or negative (-) (<90 ng/ml).

RESULTS: Women with RFs had an increased relative risk (RR) for having a short CL at 24-26 wks ranging from a RR of 1.8 (1.2-2.6) for BV+ to 6.7 (2.8-15.7) for women with RFs. RFs also were more likely to be FFN+ with RR ranging from 2.0 to 2.3. Depending on which RF was present, in FFN+ women at 24-26 wks, those with a short CL were 2 to 7-fold more likely to become FFN+ at 28-30 wks than were women with a normal CL. As an example, women with a prior SPB and a short CL were 7.2-fold more likely to become FFN+ at 28-30 wks than those with a normal CL. Similarly, women with a normal CL at 24-26 wks who were FFN+ were 3 to 6-fold more likely to develop a short CL by 28-30 wks compared to those who were FFN- Most women (72%) who were FFN+ at 24-26 wks became negative at 28-30 wks, while most (56%) of the women who had a short CL at 24-26 wks still had a short CL at 28-30 wks. In each time period, women who were FFN+ and had a short CL were substantially more likely to develop a short CL by 28-30 wks compared to women with either a normal CL or an intermediate and approximately equal risk of SPB, while women who were FFN- and had a normal CL had a low risk of SPB. Women with persistent positive tests were at greater risk for SPB than were those with intermittent positive tests.

CONCLUSION(S): While variably influenced by other risk factors, a short CL predicts subsequent FFN positivity, and FFN positivity predicts subsequent cervical shortening. Most FFN+ women subsequently became FFN- and one-third of women with a short CL subsequently had a normal CL four wks later. Data derived from cervical ultrasound and FFN testing do not support a single predominant pathway preceding preterm birth.


OBJECTIVE: The "fetal inflammatory response syndrome" (FIRS) is present in 45% of cases with preterm premature rupture of membranes (PPROM) and is associated with adverse perinatal outcome. FIRS is characterized by multifetal involvement including activation of hemostatic and immune systems, the release of cytokines and matrix degrading enzymes into the fetal circulation and endocrine evidence of fetal stress expressed as an abnormal cortisol/dehydroepiandrosterone ratio. The fetal myocardium is a potential target organ of cytokines released during FIRS.

STUDY DESIGN: Fetal echocardiography was performed in 200 patients (150 controls and 50 with preterm PROM). Doppler flow velocity waveforms were obtained from the atrioventricular valves. Cardiac function was assessed by examining the early diastolic filling (E wave) and late diastolic filling (A wave or atrial component) of the atrioventricular Doppler wave form. Peak velocities, as well as the area under the curve (velocity-time integral or VTI, an index of volumetric flow), were recorded. Results were expressed as a ratio of the observed mean for gestational age of each parameter. SPSS was used for statistical analysis.

RESULTS: Fetuses with preterm PROM had a higher delta E/A ratio, E velocity, E VT/A VT ratio but not a delta A ratio in the mitral valve when compared to controls (see Table for results and p values)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Preterm PROM (median)</th>
<th>Control (median)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delta E Velocity</td>
<td>0.046 ([0.126;0.217])</td>
<td>0.0681 ([0.136;0.207])</td>
<td>0.04</td>
</tr>
<tr>
<td>Delta E/A Ratio</td>
<td>0.094 ([0.024;0.04])</td>
<td>0.0604 ([0.065;0.202])</td>
<td>0.01</td>
</tr>
<tr>
<td>Delta E VTI</td>
<td>0.006 ([0.012;0.025])</td>
<td>0.00005 ([0.015;0.019)]</td>
<td>0.026</td>
</tr>
<tr>
<td>Delta A VTI</td>
<td>0.005 ([0.015;0.014])</td>
<td>0.0003 ([0.014;0.020])</td>
<td>0.08</td>
</tr>
</tbody>
</table>

CONCLUSION: Fetuses with preterm PROM have evidence of left ventricular cardiac dysfunction with increased cardiac compliance. This novel observation may be attributed to the direct effect of cytokines on the fetal heart. Seprate adult patients display a similar cardiac response and failure to increased cardiac compliance is associated with increased mortality. Increased fetal cardiac compliance may have survival value.

63 DO ANTENATAL CORTICOSTEROIDS BENEFIT NEONATES <1000 GRAMS? M. O'Sullivan, M. del Moral, N. Clauer, S. Vanbuskirk, and E. Bancalar. University of Miami, Jackson Memorial Hospital, Miami, Florida.

OBJECTIVE: To determine the effect of prednisone (PS) and betamethasone (AS) on survival and intraventricular hemorrhage (IVH) incidence in extremely lowbirth weight (ELBW) infants.

STUDY DESIGN: Prospective perinatal information was collected on all neonates with birth weight 500-1000g born at Jackson Memorial Hospital from January 1992 to December 1997. Pearson Chi-Square and Logistic regression analysis were used to analyze the relationship between perinatal variables including AS exposure, type of delivery, presentation, year of birth, birth weight, gender, race, 5 minute Apgar score and the outcome variables of survival and IVH incidence.

RESULTS: A total of 660 infants were followed until discharge or death. Of these 530 (80.3%) survived, and 383 (58%) were exposed to AS. The survival rate of AS exposed infants was 88.5% vs. 66% in the non-exposed group (p<0.001). AS use increased significantly from 29.5% in years 1992-93 to 75.7% in 1994-97 (p<0.001). Survival rate increased from 75.2% in 1992-93 to 83.1% in 1994-97 (p<0.02) while survival for these two periods remained unchanged within groups (AS exposed 86.5% vs. 89.2% and non-exposed 70.4% vs. 66.1%). The effect of AS exposure was more marked in the <750g infants who had a survival of 81.3% when exposed to AS vs. 54.6% in the non-exposed (p<0.001). Multivariate analysis showed that AS exposure in <1000g infants was associated with a significant increase in survival rate (Odd Ratio 2.47, CI 1.57-3.9). The incidence of IVH for infants surviving >7 days was 32.2% in the AS exposed vs. 47.1% in the non-exposed infants (p<0.001). There was no difference in incidence of IVH over the two time periods. Multivariate analysis indicated that AS exposure decreased IVH incidence (Odd Ratio 0.57, CI 0.39-0.83).

CONCLUSIONS: AS exposure has increased more than two fold for the <1000g neonate, with a significantly improved survival rate and decreased incidence of IVH. This is true for those above and below 750g. These improvements are steroid related and independent of other confounding factors.
PRETERM PREMATURE RUPTURE OF MEMBRANES IS ASSOCIATED WITH DECREASED SONOGRAPHIC CERVICAL LENGTH. J Kurtzman, L Coogan, L Goldsmith, M McNamara, J Spinato. Dept. OB/Gyn, Univ of Louisville, Louisville, KY.

OBJECTIVE: The purposes of the study were to determine if preterm premature rupture of membranes in the absence of labor is associated with cervical shortening on ultrasound, and to assess the correlation and agreement between transperineal and transvaginal ultrasound in patients with ruptured membranes.

STUDY DESIGN: Twenty-two patients between 22-34 weeks' gestation with preterm premature rupture of membranes in the absence of labor underwent cervical length assessment by transperineal ultrasound. Each patient was paired with three control patients with intact membranes matched by gestational age (88 patients total) who had undergone routine transperineal cervical length screening in the absence of labor. Exclusion criteria included: history of preterm labor or preterm delivery, or clinical evidence of labor (greater than 5 contractions per hour by monitoring, any contractions perceptible to the patient, or documented cervical change). Controls were selected by random number generator assignment from eligible cases. The Pearson correlation coefficient and the Helmert contrast for within-groups repeated measures analysis of variance was used. The power of the study was 80% at this sample size. For comparison of transvaginal and transperineal cervical length measurements in this setting, twelve patients (five of whom were in labor) underwent cervical assessment with both techniques.

RESULTS: Transperineal mean cervical length in patients with preterm premature rupture of membranes in the absence of labor was shorter than controls with intact membranes (26+7mm versus 37+7mm, p < 0.0005). Controls did not differ significantly from each other (p > 0.508). Our prospective design dictated matching for gestational age to eliminate this parameter as a possible confounding variable; however, there was no statistically significant correlation ultimately shown between cervical length and gestational age in either patients with ruptured membranes or controls. Transperineal and transvaginal measurements in the same patients with ruptured membranes demonstrated excellent correlation and concordance (r=0.97) with a sample concordance of 0.965.

CONCLUSIONS: As a group, patients with preterm premature rupture of membranes have shorter cervical lengths than control patients with intact membranes at matched gestational ages, even in the absence of labor. Consistent with our previously published study of over 200 patients with intact membranes, transperineal ultrasound appears to be as reliable as transvaginal ultrasound for the assessment of cervical length in patients with ruptured membranes, as well as offering the advantage of decreased vaginal instrumentation.


OBJECTIVE: To evaluate the learning curve and over a decade of outcomes of MFPR performed at centers with the world's largest experiences.

STUDY DESIGN: Collaborative data of 3,037 completed cases from 11 centers in 5 countries were analyzed by year, starting, and finishing numbers, and outcome.

RESULTS: There has been a dramatic improvement in outcomes with increasing experience with decreasing losses and prematurity.

<table>
<thead>
<tr>
<th>Losses</th>
<th>Delivery GA</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 24</td>
<td>25-28</td>
</tr>
<tr>
<td>1986-90</td>
<td>13.2%</td>
</tr>
<tr>
<td>1991-94</td>
<td>10.8%</td>
</tr>
<tr>
<td>1995-97</td>
<td>7.5%</td>
</tr>
</tbody>
</table>

Overall Loss rates still correlate with starting(s) and finishing(f) number (S6+17.9%; S5:15.2%; S4:9.0%; S3:4.9%; S2:0.9%; F6:12.5%; F5:7.2%; F4:6.0%). The proportion of S5+ cases has diminished from 7.3% to 2.6% to 2.1%. The proportion of patients >40 yrs. has increased in the last 6 yr (x2 = 77.8, p<.001), but GA at delivery has not changed with increasing maternal age, but is still correlated to starting number.

CONCLUSION: 1) MFPR outcomes for both losses and early prematurity have dramatically improved with experience; 2)3→2 and now 4→2 do as well as natural twins; 3) Higher starting numbers do worse; 4) Patient demographics continues to change as more older women use assisted reproductive technologies.
ORAL CONCURRENT SESSION F

Genetics
Ultrasound
Prenatal Diagnosis

Saturday, January 23, 1999
8:00 am - 10:30 am

Moderators:  Fernand Daffos, MD
              James E. Ferguson, II, MD
              Nancy Chescheir, MD

Judges:      TBA
              Ronald M. Ramus, MD
              William W. Andrews, MD

Continental Ballroom 5-6
Abstract Numbers 67-76
67 THE EFFECT OF GESTATION DATING ERROR ON BIRTH WEIGHT REFERENCE STANDARDS AT TERM. J. Gansu, A. Forest, P. RAM, QM University Hospital, Nottingham, UK.

OBJECTIVE: Recent work has highlighted the frequent inaccuracies of gestation dating by last menstrual period (LMP), and has shown that scan dates are better at predicting the expected date of confinement. We wanted to compare the effect these two different dating methods have on term birth weight reference curves within the same population.

STUDY DESIGN: The database consisted of 24,380 consecutive singleton pregnancies delivered in our unit. They were unselected except that they all had a prospectively recorded 'certain' LMP and a routine mid-trimester scan. Scan dates were derived from biparietal diameter measurement using a standard dating formula.

RESULTS: The birth weight curve dated by LMP (left) showed flattening from 41 weeks and there were a considerable number of deliveries at 43 weeks (n=612) and 44 weeks (n=292). In contrast, by scan dates, the birth weight curves were straight but shorter, as there was virtually no data at 43 weeks (n=34) and 44 weeks (n=13).

CONCLUSIONS: Most post-term gestations are an artifact of incorrect gestation dating. Birth weight standards from databases reliant on menstrual history show flattening at term which artificially depresses the birthweight-for-gestation standard.

68 PRENATAL EVALUATION & SHUNTING FOR FETAL OBSTRUCTIVE UROPATHY: MANAGEMENT OF NEARLY 100 CASES. M.P. Johnson, B. F earnings, S. Kasapiski, F. Qureshi, R. Jacques, R. Gonzales, and M.I. Evans. Depts. OB/GYN, Molecular Medicine and Genetics, Pathology, and Pediatric Urology, Wayne State University, Detroit, MI.

OBJECTIVE: To analyze the 10 year experience of a fetal therapy program in the prenatal evaluation and treatment of lower urinary tract obstruction (LUTO).

METHODS: Between 1987-1997, 97 fetuses with LUTO between 14-32 weeks GA (defined as megacystis, bilateral hydronephrosis, and oligohydramnios) were evaluated. 84 had complete evaluations which included karyotyping, detailed sonographic evaluation, and serial vesicocenteses to establish renal prognosis. Cases without associated major anomalies, normal karyotypes, and a good urinary prognosis based on our published criteria were offered intervention by shunting. Some poor prognosis cases were considered for intervention at parental request. All fetuses that died had histologic confirmation of degree of renal damage, and all surviving fetuses have been followed for renal outcomes.

RESULTS: 49 fetuses had a good urinary prognosis of which 31 are alive. 25 had karyotypes of which 21 (84%) had good and 4 (16%) had poor renal outcomes. 6 fetuses are alive with good renal outcomes without shunting. 18 good prognosis fetuses died: 10 were not shunted and followed their predicted natural outcomes, while 8 shunted cases were lost, 1 from a procedural complication and 7 from nonrenal causes (of which one had histologic evidence of significant renal damage). 35 had a poor urinary prognosis: 2 are alive following shunting and postnatal renal replacement. The 33 others died, of which 11 were shunted at parental request, and 10 were subsequently confirmed to have severe and 1 to have moderate renal damage. The remaining 22 were unreacted or terminated and were shown to have significant renal fibrosplasia on autopsy.

CONCLUSIONS: 1) Multicompontent, serial ultrasound is predictive of renal outcome following uncomplicated vesicocentese shunting, 2) shunting may prevent renal dysplasia and pulmonary hypoplasia in carefully selected cases, 3) incidence of aneuploidy and cloacal anomalies are increased in this population, and 4) complications following successful shunt placement remain high.


OBJECTIVE: 1) to assess the accuracy of umbilical blood flow (UBF) using different Doppler techniques. The best correlation with a standard level of ultrasound was achieved with Doppler. 2) to determine the influence of cordocentesis on the UBF of the umbilical vein (UV) catheters for measurement of UBF by ES/0 steady state diffusion technique based on the Fick principle. Steady state and triplex ultrasound exams were performed after a 5 day interval. The mean of three 10 to 60 sec intervals of UV total blood flow was obtained by Doppler. The mean of three UV diameters (real-time) was obtained at the same UV location as the TAM. UBF (ml/min) calculated by $\pi r^2 \times TAM$ (cm/s) X 0.88. This was performed on both veins so that UBF could be determined.

RESULTS: Six cases at 128 days gestation had surgical placement of a peripheral and common umbilical vein (UV) catheter for measurement of UBF by ES/0 steady state diffusion technique based on the Fick principle. Steady state and triplex ultrasound exams were performed after a 5 day interval. The mean of three 10 to 60 sec intervals of UV total blood flow was obtained by Doppler. The mean of three UV diameters (real-time) was obtained at the same UV location as the TAM. UBF (ml/min) calculated by $\pi r^2 \times TAM$ (cm/s) X 0.88. This was performed on both veins so that the UBF could be determined. At necropsy the number and weights of cordocentesis served by each vein, and the fetal weight were recorded. UBF was normalized for fetal weight. Linear regression and paired t-tests were performed on: 1) UBF by triplex vs. steady state technique, 2) UBF/cordocentesis between veins, 3) UBF/gm cordocentesis between veins.

CONCLUSIONS: UBF determiniation by triplex mode ultrasound is accurate. UBF between umbilical veins is different between the two umbilical veins of given sheep fetus. However, when UBF is corrected for either the number or weight of cordocentesis there is no difference in flow between two umbilical veins. It may be that the mass and/or number of cordocentesis served by a given vein determine the amount of blood flow in that particular vein (supported by AAOGF).

70 HYPERGLYCOsYLATED hCG PLUS ULTRASOUND BIOMETRY: A NEW DOWN SYNDROME SCREENING ALGORITHM FOR ADVANCED MATERNAL AGE. R. Balado-Singh, U Onk, S. Shaaban, K. Rinne, A. Adziga, R. Sihk, D. Hunter, C. Hsu, J. Copel, M. Mahoney, L. Cole. Depts. OB/GYN, Yale School of Medicine, New Haven, CT, Norwalk Hospital, Norwalk, CT, Bridgeport Hospital, Bridgeport, CT.

OBJECTIVE: Hyperglycosylated hCG (HhCG) is a form of hCG with abnormally branched oligosaccharide side chains. We have observed elevated levels of HhCG in Down syndrome (DS) pregnancies and report a new algorithm which combines urine HhCG and ultrasound biometry to assess fetal karyotype.

STUDY DESIGN: Urine HhCG, humerus length (HL) and nuchal thickness (NT) were measured prospectively in women undergoing mid trimester amniocentesis. Urine HhCG was measured by a pregnancy sandwich asay using monoclonal antibody, B-152. HL and NT and HhCG values were expressed as MoM and the DS screening efficiency of the algorithm.

RESULTS: There were 25 DS cases of a total of 1062 singleton pregnancies. The mean (SD) gestational age was 16.1 (2.6) weeks and amniocentesis. The mean (SD) maternal age was 37.1 (5.2) years. Biometric plus HhCG had a 91.3% detection rate at 3.2% false positive rate and 105% detection rate at a 10.7% false positive rate. The area (SE) under the ROC curve was 0.9862 (0.0080), p <0.00001. The AUC (SE) for HhCG plus NT was 0.9141 (0.0172), p <0.00001. The AUC was significantly larger for the combined biochemical and biometry algorithm (p <0.02), proving that it was superior to HhCG plus age alone.

CONCLUSIONS: A new DS biochemical marker combined with ultrasound biometry had a high screening efficiency. All cases of Down syndrome in this study population were diagnosed at an amniocentesis rate of 1%. The results of this algorithm were superior to that reported with other marker combinations. The new algorithm appears promising as an alternative to 'routine' genetic amniocentesis in advanced maternal age.
### 71 PROSPECTIVE EVALUATION OF FREE βhCG AND DIMERIC INHIBIN A FOR ANEUPLOIDY DETECTION

**K.D. Weinsten, J. Owen, D.C. Chart, L. Boos**, Dept OB/GYN, Univ of Alabama at Birmingham, Birmingham, AL

**OBJECTIVE:** To prospectively evaluate free βhCG (FβhCG) and dimeric inhibin A (FIIhG) for the detection of Down syndrome (DS) and other aneuploidies (OA).

**STUDY DESIGN:** Patients who had a second trimester multiple marker screening test (MMST: AFP, estradiol, hCG) and genetic amniocentesis from 8/15/96 to 4/8/98 were included. Serum was analyzed for AFP, estradiol (E3), hCG, IHA, and FβhCG. Detection (Det%) and false positive (FP%) rates for both the traditional MMST and 3 new analytic combinations at 5 different DS screening risk cutoffs were determined and compared; a unique algorithm for Trisomy 18 detection was employed.

**RESULTS:** 1,256 patients were evaluated and 25 aneuploidies were identified (13 DS and 10 OA; 5 Tri 18, 2 24X, 2 translocations, 1 Tri 13, 1 Sex, 1 triploidy); mean maternal age was 35.9 ± 4.6 years. The DS cutoff yielding the best rates (1:190) is depicted:

<table>
<thead>
<tr>
<th>FP%</th>
<th>DS DET%</th>
<th>OA DET%</th>
<th>ALL A DET%</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMST</td>
<td>20</td>
<td>69</td>
<td>65</td>
</tr>
<tr>
<td>MMST plus IHA</td>
<td>19</td>
<td>85</td>
<td>74</td>
</tr>
<tr>
<td>AFP, FβhCG, IHA</td>
<td>19</td>
<td>62</td>
<td>60</td>
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</table>

**CONCLUSIONS:** When evaluated prospectively, the quadrivariate combination of the traditional MMST (AFP, E3, hCG) plus IHA yields superior results, with a lower FP% (at a mean MA=35.9 years) and increased detection of all aneuploidies (74%).

### 72 SELECTIVE TERMINATION (ST) FOR STRUCTURAL (STR), CHROMOSOMAL (CHR), AND MENDELIAN (MEN) ANOMALIES: INTERNATIONAL EXPERIENCE


**OBJECTIVE:** To evaluate the outcomes of ST for fetal anomalies worldwide with the largest experiences.

**STUDY DESIGN:** 375 cases with outcomes from 8 centers in 4 countries were analyzed for outcomes by year, gestational age (GA) at procedure, and indication. 321 were 2-18 weeks, 36 were 19-24 weeks, 18 were 25-29 weeks, 4 of unknown gestational age. Almost all cases were by KCL.

**RESULTS:** ST results in viable delivery in >90% of cases. Losses to 24 weeks for cases finishing (F) with F1:5.9%, F2:11.6%. Losses for STR were 8/13/96 to 4/8/98 were included. Serum was analyzed for AFP, estriol, hCG, IHA (IgG), and FβhCG. Detection (Det%) and false positive (FP%) rates for both the traditional MMST and 3 new analytic combinations at 5 different DS screening risk cutoffs were determined and compared; a unique algorithm for Trisomy 18 detection was employed.

**RESULTS:** 1256 patients were evaluated and 25 aneuploidies were identified (13 DS and 10 OA; 5 Tri 18, 2 24X, 2 translocations, 1 Tri 13, 1 Sex, 1 triploidy); mean maternal age was 35.9 ± 4.6 years. The DS cutoff yielding the best rates (1:190) is depicted:

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**CONCLUSIONS:** When evaluated prospectively, the quadrivariate combination of the traditional MMST (AFP, E3, hCG) plus IHA yields superior results, with a lower FP% (at a mean MA=35.9 years) and increased detection of all aneuploidies (74%).

### 73 EFFICACY OF SECOND-TRIMESTER GENETIC SONOGRAPHY IN GUIDING CLINICAL MANAGEMENT OF PATIENTS WITH INCREASED RISK FOR FETAL TRISOMY 21: AN UPDATE

**SMFM Abstracts S13


**OBJECTIVE:** To provide an update on the efficacy of using genetic sonography in the clinical management of patients at increased risk for fetal trisomy 21 at our institution.

**STUDY DESIGN:** From 11/1/92 to 6/30/98 a second-trimester genetic sonogram was offered to all women at increased risk for fetal trisomy 21 (±274) who either had declined genetic amniocentesis or chose to have a sonogram prior to deciding whether to undergo an amniocentesis. In addition to the standard fetal biometry the following aneuploidy markers were evaluated: structural anomalies (including face, hands, and cardiac (4-chamber view and outflow tracts), short femur, short humerus, pylectasia, nuchal fold thickening, echogenic bowel, choroid plexus cysts, hypoplastic middle phalynx of the fifth digit, sandal gap, 2-vees seminal cord and since October 1997, echogenic intracardiac focus. Outcome information included the results of the genetic amniocentesis, if performed, and the results of pediatric assessment and follow-up after birth.

**RESULTS:** A total of 2,038 fetuses between 15-24 weeks (means±SD = 19.2±1.4) were evaluated. The indications for genetic sonography included 1,451 with advanced maternal age (233 years), 406 with abnormal serum biochemistry and 291 with both. The majority (1,780 or 87%) had a normal genetic sonogram (absence of any abnormal ultrasound markers), 182 (9%) had 1 marker present and 76 (4%) had 2 markers present. Outcome was obtained on 1,961 fetuses (ongoing pregnancies, n=592; and lost to follow-up, n=85). The following had 21 abnormal ultrasound markers present: 26/31 fetuses with trisomy 21, 2/2 fetuses with trisomy 18, 2/3 fetuses with trisomy 13 and 3/4 fetuses with other chromosome abnormalities. When 21 abnormal ultrasound markers were present, the sensitivity, specificity, positive and negative predictive values for trisomy 21 were 84%, 91%, 16% and 99.7%, respectively. The overall amniocentesis rate was 10% and among cases with known outcomes was 11%. When 22 abnormal ultrasound markers were present, the sensitivity, specificity, positive and negative predictive values for trisomy 21 were 71%, 98%, 45% and 99.5%, respectively.

**CONCLUSION:** In our center, clinical management of patients at increased risk for fetal trisomy 21 by using second trimester sonography has resulted in a high detection rate of trisomy 21 (84%) with an amniocentesis rate of approximately 10%.

### 74 OPEN FETAL REPAIR OF MYELOMENINGOCELE IMPROVES NEUROLOGIC OUTCOME IN THE NEONATE


**OBJECTIVE:** To compare neurologic outcomes of infants treated with uterine repair of myelomeningocele to those receiving standard care from the same physicians at the same institution during the same time period. Continuous variables were compared with the Mann-Whitney rank-sum test, and categorical variables were compared by Fisher's exact test when appropriate.

**RESULTS:** All fetuses had ventriculomegaly and a Chiari malformation in utero. The size and location of the myelomeningocele, as well as the incidence of talipes, was comparable between groups. Infants treated in utero had a significantly decreased need for ventriculoperitoneal shunt placement, associated with partial/total resolution of the Chiari malformation. In utero repair was also associated with a significant risk for preterm labor and preterm delivery, but serious complications were not encountered.

**CONCLUSIONS:** Open fetal repair of myelomeningocele results in significant improvement in neonatal outcome in the newborn. Long-term studies of neurologic function are required.
**THE ROLE OF ULTRAFAST T2 WEIGHTED MAGNETIC RESONANCE IMAGING IN THE PRENATAL DIAGNOSIS OF FETAL MALFORMATIONS.**


**OBJECTIVE:** Single shot Half-Fourier fast spin echo T2 weighted magnetic resonance imaging (MRI) permits imaging of the fetus without significant motion artifact and overcomes the limitations of conventional magnetic resonance imaging. This study objective was to determine if fetal MRI provides additional or different useful diagnostic information in selected cases of fetal malformations suspected on ultrasound (US).

**STUDY DESIGN:** Pregnant patients, referred for MRI when congenital anomalies were identified by ultrasound were prospectively evaluated by a multidisciplinary team in the Fetal Therapy Center to compare MRI and ultrasound findings. Data was collected on MRI quality, comparative MRI and US findings (MRI same, different, additive, or less information than US), and assessment of MRI usefulness compared to US (MRI helpful, not helpful). Imaging results were correlated with postnatal or autopsy findings. MRI usefulness was also examined by anomaly types.

**RESULTS:** From 4/97 to 6/98 there were 34 cases, with 25 livebirths, 7 terminations (TOP), and 2 fetal demises/stillbirths. MRI was technically good in 32 and limited in 2 cases. MRI provided the same information as US in 19 (56%); different in 7 (21%); additive in 7 (23%); and less in 1 (3%). MRI was helpful in 14 (41%) and not helpful in 20 (59%). When MRI and US were the same (19), there was postnatal/autopsy correlation in 95% of cases. When MRI was different from US (15), postnatal correlation showed US correct in 20% and MRI correct in 80% of cases. By anomaly type, MRI was most helpful for diaphragmatic hernia (CDH), specifically for identification of liver in the chest (3 of 5), and for ventriculomegaly/hydrocephalus (6 of 6), especially for cerebral atrophy and definitive imaging of the corpus callosum. MRI diagnoses were also more accurate in selected and unusual cases, including conjoined twins and intra-abdominal pulmonary sequestration. MRI did not add additional information in most cases of renal anomalies, omphaloceles, posterial fossa anomalies and neural tube defects. Skeletal or bony abnormalities were not well imaged by MRI.

**CONCLUSIONS:** Compared to ultrasound, for the evaluation of fetal congenital anomalies, fetal ultrafast MRI may provide different or additional information in approximately 40% of cases. MRI appears to be most useful in CDH, central nervous system anomalies, and other selected unusual cases.

**UTILITY OF MINOR ULTRASOUND FINDINGS IN DETECTING ANEUPLIOIDY IN A PRENATAL DIAGNOSTIC CENTER.**

B. Sohl, A. Scioscia, T. Moore. Div. of Perinatal Medicine, Univ. of Cal., San Diego, CA.

**OBJECTIVE:** To assess the value of minor ultrasound findings (MUF) in predicting major aneuploidy abnormalities (MKA).

**STUDY DESIGN:** 2743 fetuses (14-25 weeks gestational age) prospectively underwent a detailed ultrasound (US) survey prior to genetic amniocentesis. Criteria for 8 MUF were established. Odds ratios (OR) of MKA with MUF were calculated utilizing chi square and Fisher's exact test.

**RESULTS:** 15.1% of fetuses had a single MUF (SMUF) while 2.1% had multiple MUF (MMUF) and 2.7% of fetuses had a major ultrasound abnormality (MUA). 104 fetuses (3.8%) had a MKA. A SMUF increased risk of MKA 5.7 fold (CI 3.5-9.3) whereas MMUF increased the risk of MKA 12.0 fold (CI 5.5-26.5).

<table>
<thead>
<tr>
<th>SMUF</th>
<th>OR</th>
<th>95% CI</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Vessel Cord (2VC)</td>
<td>5.8</td>
<td>1.3 - 26.1</td>
<td>14.1</td>
<td>1.5 - 124</td>
</tr>
<tr>
<td>Echogenic Cardiac Foci (ECF)</td>
<td>4.0</td>
<td>2.0 - 7.8</td>
<td>15.2</td>
<td>5.9 - 39.4</td>
</tr>
<tr>
<td>Choroidal Separation (CS)</td>
<td>6.3</td>
<td>1.8 - 22.0</td>
<td>3.6</td>
<td>0.46 - 27.7</td>
</tr>
<tr>
<td>Choroid Plexus Cyst (CPC)</td>
<td>2.9</td>
<td>1.2 - 6.9</td>
<td>3.6</td>
<td>0.46 - 27.7</td>
</tr>
<tr>
<td>Echogenic Bowel (EB)</td>
<td>2.4</td>
<td>0.74 - 8.0</td>
<td>27.1</td>
<td>9.0 - 81.0</td>
</tr>
<tr>
<td>Short Femur (SF)</td>
<td>1.2</td>
<td>0.17 - 9.3</td>
<td>23.8</td>
<td>7.6 - 87.4</td>
</tr>
<tr>
<td>Mild Ventriculomegaly (MV)</td>
<td>Null</td>
<td>Null</td>
<td>9.2</td>
<td>1.1 - 77.3</td>
</tr>
<tr>
<td>Renal Pyelectasis (RP)</td>
<td>2.7</td>
<td>0.63 - 11.6</td>
<td>Null</td>
<td>Null</td>
</tr>
</tbody>
</table>

The addition of MUF to MUA increased detection of MKA from 27.9% to 68.3%. For trisomy 21, sensitivity rose from 16.4 to 67.3%. Given the a priori MKA risk of 1:26, a normal US reduced the risk to 1:67.

**CONCLUSIONS:** MKA risk assessment by US is greatly enhanced by the addition of MUF. As isolated findings 2VC, ECF, CS, and CPC were significant. EB, SF, and MV were significant only when found with other MUF. We found that a normal ultrasound reduced the risk of aneuploidy by 61%.
POSTER SESSION I

Thursday, January 21, 1999
10:00 am - Noon

Yosemite and Franciscan Rooms

CATEGORIES

Diabetes
Hypertension
Genetics/Teratology
Computers

Poster Numbers

77-191

Judges: Carol A. Major, MD
Dwight J. Rouse, MD
Jerome Yankowitz, MD
77 RISK FACTORS FOR PREECLAMPSIA AND ADVERSE NEONATAL OUTCOMES IN WOMEN WITH PREEXISTING DIABETES MELLITUS. Bahar M Siba, MD, for the NICHD MFMU Network, Bethesda, MD.

OBJECTIVE: To identify risk factors for pre eclampsia and adverse neonatal outcome in women with class B-R diabetes mellitus.

STUDY DESIGN: We analyzed outcome data from 462 women with preexisting diabetes enrolled between 13-26 weeks' gestation in a multicenter trial of low-dose aspirin for pre eclampsia prevention. 348 had Class B/C, 56 Class D, 37 Class F, and 21 Class R diabetes. 79 women were hypertensive and 86 had proteinuria at randomization. Pre eclampsia was defined according to strict clinical criteria specified prior to analysis.

RESULTS: 92 women (20%) developed pre eclampsia and 5 (1%) had abruptio placentae. Low-dose aspirin had no effect on pre eclampsia incidence (18 v 22%). The incidence of pre eclampsia differed significantly by class (F/R: 36%, D: 21%, B/C: 17%, p=0.003) and in those with proteinuria at randomization (28 v 18%, p=0.004), but not in those with hypertension at randomization (24 v 19%, p=0.31). There were no differences in neonatal outcome between Class B/C and D except for delivery<37 wk (RR 1.43, 95th CI 1.04-1.97). Neonatal outcomes by class of diabetes and presence of proteinuria at randomization included:

<table>
<thead>
<tr>
<th>Diabetes Class</th>
<th>Proteinuria</th>
<th>F/R %</th>
<th>B/C %</th>
<th>RR</th>
<th>Absent %</th>
<th>Present %</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delivery&lt;37 wk</td>
<td>62.1</td>
<td>32.5</td>
<td>19.1</td>
<td>2.52</td>
<td>58.1</td>
<td>33.2</td>
<td>0.0003</td>
</tr>
<tr>
<td>&lt;35 wk</td>
<td>36.2</td>
<td>22.8</td>
<td>12.8</td>
<td>1.84</td>
<td>29.1</td>
<td>13.5</td>
<td>0.0003</td>
</tr>
<tr>
<td>SGA (n&lt;10th%)</td>
<td>10.7</td>
<td>5.5</td>
<td>3.1</td>
<td>1.27</td>
<td>14.5</td>
<td>2.7</td>
<td>0.0001</td>
</tr>
<tr>
<td>LG (≥100th%)</td>
<td>14.5</td>
<td>7.6</td>
<td>4.0</td>
<td>2.06</td>
<td>14.5</td>
<td>4.0</td>
<td>0.0008</td>
</tr>
<tr>
<td>&lt;4000 gms</td>
<td>3.6</td>
<td>17.5</td>
<td>0.2</td>
<td>1.08</td>
<td>3.6</td>
<td>18.4</td>
<td>0.0008</td>
</tr>
</tbody>
</table>

CONCLUSIONS: In women with preexisting diabetes, preeclampsia is significantly increased in those with Class F/R and in those with proteinuria early in pregnancy. In addition, the presence of proteinuria early in pregnancy and/or Class F/R are significantly associated with adverse neonatal outcome.

78 WHAT IS THE RISK FOR HYPERTENSIVE DISEASE IN WOMEN WITH INSULIN REQUIRING DIABETES IN PREGNANCY? M. Harlau, M. de Veciana, C. Cole, P. Trail, M. McConville. Dept. OB/GYN, Eastern Virginia Medical School, Norfolk, VA.

OBJECTIVE: To quantify the risk of hypertensive disease in a cohort of women with diabetes mellitus in pregnancy.

STUDY DESIGN: This is a retrospective cohort study comparing infections in 78 women with Diabetes Mellitus (DM) (Class A~=40%, A~17%, B=23%, C=8%, D=1%, F=3%, R=5%, RF=4%) to 155 non-DM randomly selected controls delivered between 1/97 and 1/98 at the same institution. Maternal transports from other hospitals were excluded. Patients in both groups were not routinely treated with anti- or intrapartum antibiotics unless there were known GBS carriers, had rupture of membranes for ≥ 18 hours or an intrapartum fever ≥100°F. Outcome data included: pre-pregnancy Body Mass Index [kg/m²], mode of delivery, ante-, intra- and postpartum infectious morbidity.

RESULTS:

<table>
<thead>
<tr>
<th>OUTCOME</th>
<th>DM N=78 [%]</th>
<th>Non-DM N=155 [%]</th>
<th>RR [CI.] *</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-pregnancy BMI</td>
<td>29.5 ± 6.3</td>
<td>25.4 ± 4.6</td>
<td>N.A.</td>
<td>&lt;0.00</td>
</tr>
<tr>
<td>Caesarean delivery</td>
<td>30 [40]</td>
<td>33 [21]</td>
<td>2.1 [1.4,3.1]</td>
<td>&lt;0.00</td>
</tr>
<tr>
<td>Hypertension</td>
<td>0 [0]</td>
<td>1 [0.6]</td>
<td>N.A.</td>
<td>0.5</td>
</tr>
<tr>
<td>UTI/polymenorrhoea</td>
<td>7 [9]</td>
<td>12 [19]</td>
<td>1.2 [0.5,2.8]</td>
<td>0.7</td>
</tr>
<tr>
<td>Active HSV in labor</td>
<td>0 [0]</td>
<td>3 [2]</td>
<td>N.A.</td>
<td>0.3</td>
</tr>
<tr>
<td>Chorioamnionitis</td>
<td>3 [4]</td>
<td>3 [2]</td>
<td>2.0 [0,4.9]</td>
<td>0.6</td>
</tr>
<tr>
<td>Endometritis</td>
<td>9 [12]</td>
<td>3 [2]</td>
<td>4.6 [1.2,17]</td>
<td>0.02</td>
</tr>
<tr>
<td>Breast mastitis</td>
<td>0 [0]</td>
<td>1 [0.6]</td>
<td>N.A.</td>
<td>0.7</td>
</tr>
<tr>
<td>Wound infection</td>
<td>2 [4]</td>
<td>1 [0.6]</td>
<td>4.0 [0,43]</td>
<td>0.3</td>
</tr>
</tbody>
</table>

* Mantel-Haenzel adjusted RR for obesity [BMI >25]

CONCLUSIONS: The risk for infectious morbidity, primarily endometritis, is 5-fold higher in pregnancies complicated by diabetes who are not using routinely at delivery. The association between diabetes and endometritis remains despite consideration of obesity as a possible confounding variable.

79 IS PERINATAL INFECTIOUS MORBIDITY INCREASED IN WOMEN WITH DIABETES IN PREGNANCY? P. Hanena, M. de Veciana, C. Cole, P. Trail, M. McConville. Dept. OB/GYN, Eastern Virginia Medical School, Norfolk, VA.

OBJECTIVE: To quantify and qualify the risk of infectious morbidity in a cohort of women with diabetes (DM) in pregnancy.

STUDY DESIGN: A retrospective cohort study comparing infectious morbidity in 78 women with DM (Class A~40%, A~17%, B=23%, C=8%, D=1%, F=3%, R=5%, RF=4%) to 155 non-DM randomly selected controls delivered between 1/97 and 1/98 at the same institution. Maternal transports from other hospitals were excluded. Patients in both groups were not routinely treated with anti- or intrapartum antibiotics unless there were known GBS carriers, had rupture of membranes for ≥ 18 hours or an intrapartum fever ≥100°F. Outcome data included: pre-pregnancy Body Mass Index [kg/m²], mode of delivery, ante-, intra- and postpartum infectious morbidity.

RESULTS:

<table>
<thead>
<tr>
<th>OUTCOME</th>
<th>DM N=78 [%]</th>
<th>Non-DM N=155 [%]</th>
<th>RR [CI.] *</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-pregnancy BMI</td>
<td>29.5 ± 6.3</td>
<td>25.4 ± 4.6</td>
<td>N.A.</td>
<td>&lt;0.00</td>
</tr>
<tr>
<td>Caesarean delivery</td>
<td>30 [40]</td>
<td>33 [21]</td>
<td>2.1 [1.4,3.1]</td>
<td>&lt;0.00</td>
</tr>
<tr>
<td>Hypertension</td>
<td>0 [0]</td>
<td>1 [0.6]</td>
<td>N.A.</td>
<td>0.5</td>
</tr>
<tr>
<td>UTI/polymenorrhoea</td>
<td>7 [9]</td>
<td>12 [19]</td>
<td>1.2 [0.5,2.8]</td>
<td>0.7</td>
</tr>
<tr>
<td>Active HSV in labor</td>
<td>0 [0]</td>
<td>3 [2]</td>
<td>N.A.</td>
<td>0.3</td>
</tr>
<tr>
<td>Chorioamnionitis</td>
<td>3 [4]</td>
<td>3 [2]</td>
<td>2.0 [0,4.9]</td>
<td>0.6</td>
</tr>
<tr>
<td>Endometritis</td>
<td>9 [12]</td>
<td>3 [2]</td>
<td>4.6 [1.2,17]</td>
<td>0.02</td>
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<td>Breast mastitis</td>
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<td>1 [0.6]</td>
<td>N.A.</td>
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<td>2 [4]</td>
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<td>4.0 [0,43]</td>
<td>0.3</td>
</tr>
</tbody>
</table>

* Mantel-Haenzel adjusted RR for obesity [BMI >25]

CONCLUSIONS: The risk for infectious morbidity, primarily endometritis, is 5-fold higher in pregnancies complicated by diabetes who are not using routinely at delivery. The association between diabetes and endometritis remains despite consideration of obesity as a possible confounding variable.


OBJECTIVE: To evaluate the potential impact of new American Diabetes Association (ADA) gestational diabetes (GDM) screening guidelines applied to a universally-screened population.

STUDY DESIGN: A retrospective analysis of 18,834 women universally screened for GDM at the Mayo Clinic between 11-86 and 12-97. GDM screening consisted of plasma glucose determination one hour after a 50 gram oral glucose tolerance test. Diagnosis of GDM was based on National Diabetes Data Group criteria.

RESULTS: Of 559 cases of GDM diagnosed during the study period, 19 (3.4%) would have been missed under the new ADA guidelines, while only 13% of this largely Caucasian population from screening.

81 SEASONAL VARIATION SCREENING GUIDELINES FOR GESTATIONAL DIABETES. D. Newman, T. Kedeker, AF Keesler AF

OBJECTIVE: To evaluate the rate of study births (n= 30 June 1 1990 to 30 June 1 1991) during the rate period.

RESULTS: Study period (range 10 the month the rate 0. The rate greater in range dur CONC the 15-year that this n end holistic macros is in weight of weight in September.
MUST WE SCREEN FOR GESTATIONAL DIABETES IN MULTIPARAS WITH A NORMAL GLUCOSE SCREEN IN THEIR PREVIOUS PREGNANCY? N. Leroux, A. Skoll, D. Ranft*, Department of Obstetrics and Gynecology, Sainte-Justine Hospital, University of Montreal, Montreal (Qc), Canada.

OBJECTIVE: To determine the incidence of gestational diabetes mellitus (GDM) in a second or subsequent pregnancy with normal 50g screen in the first pregnancy, for a population with a relatively high incidence of GDM (10%).

STUDY DESIGN: This cohort study involved all patients delivering for the second or subsequent time at our institution between 1/2/96-31/12/1997 who had a normal 50g screen in the first pregnancy. Data were collected for: maternal parity, age and pre-pregnancy weight, gestational age at 50g glucose screen and at delivery, results of 50g and 100g glucose tests, birthweight, and mode of delivery.

RESULTS: 1209 patients were eligible for study. The mean interval between pregnancies was 2.9 yrs. No significant difference was found between the two pregnancies regarding pre-pregnancy weight: 62.5 ± 0.55kg and 65.5 ± 0.55kg respectively. Likewise, gestational age at delivery and birthweight were comparable in the two pregnancies: 39.5 ± 0.05 wks and 3388 ± 15g vs 39.1 ± 0.04 wks and 3510 ± 33g. GDM occurred in 53 (4.4%) of the 1209 patients studied in their second pregnancy. 42 (3.5%) patients were controlled with diet and 11 (0.9%) required insulin.

CONCLUSION: Our results reveal an incidence of GDM in the second pregnancy of patients with normal glucose screen in the first pregnancy less than half of that for our overall population (4.4 vs 10%). However, this incidence is not low enough to recommend cessation of screening in the second pregnancy. It remains to be proven whether a similar reduction in the incidence of GDM in the second pregnancy could be noted within a population with a lower overall incidence of GDM.
JELLY BEANS AS AN ALTERNATIVE TO THE GLUCOLA FOR GESTATIONAL DIABETES SCREENING. ME Lerner, SR Allen, AT Countye, TJ Gasle, SHollema, T Kuehle. Dept of OB/Gyn, Pathology: Medical Biochemistry & Genetics, Scott & White Clinic, Texas A&M University HSC, Temple, TX.

OBJECTIVE: To test the hypothesis that a standardized dose of jelly beans can be used as an alternative glucose source to the 50 gram oral glucose for screening of gestational diabetes mellitus (GDM).

STUDY DESIGN: 160 pregnant women 24 to 28 weeks' gestation were recruited from the general obstetric population at a multi-specialty clinic for a prospective study designed to compare serum glucose response, side effects, preference, and ability to detect GDM. Participants were randomized to receive glucose (50 gram glucose dose) or 28 jelly beans (about 50 gram simple carbohydrate) and serum glucose values were determined one hour later. Within 2 weeks the test was repeated using the alternate glucose source. Finally, a 100 gram 3-hour oral glucose tolerance test was performed. Following each step, all participants completed a questionnaire recording subjective outcome variables. ADA criteria were used to interpret all tests.

RESULTS: 136 participants completed the study. No significant differences were found between post-test serum glucose values (glucola = 116±26, jelly beans = 114±22, p=0.46), frequency of discrepant results (p=0.58), sensitivity, specificity, and predictive values. Jelly beans yielded fewer side effects (glucola = 38% vs jelly beans = 20%, p<0.001) and were the preferred screen (jelly beans preferred 76% vs 24%, p<0.001). Five cases (3.7% incidence) of gestational diabetes were identified: 3 by glucola, 1 by jelly bean, and 1 by both.

CONCLUSIONS: Jelly beans may be used as an alternative to the glucola beverage for GDM screening. Both sources provoke a similar serum glucose response. Patients report fewer side effects after a jelly bean carbohydrate challenge than after drinking glucola.

ALTERNATIVE METHODS OF DIAGNOSING GESTATIONAL DIABETES. AN Thawer, A. Lee-Parriz, E. Lieberman, R. Barbieri, Brigham & Women's Hospital, Boston, MA.

OBJECTIVE: To find alternative, more cost-effective approaches to diagnosing gestational diabetes mellitus (GDM). We evaluated whether: 1) omission of the third hour plasma glucose measurement of the glucose tolerance test (GTT) altered the sensitivity of the test, 2) there is a glucose loading test (GLT) plasma glucose result above which all GTTs are positive, and 3) the presence of an elevated fasting plasma glucose (FG) suffices to make a diagnostic test following an abnormal GLT.

STUDY DESIGN: The charts of 512 patients with a 100 gm 3 hour glucose tolerance test (GTT) at our institution between 1/95 - 12/96 were reviewed. All these subjects had a 50 gm GLT with plasma glucose level >140 mg/dL. A positive GTT was defined using the National Diabetic Diagnostic Group criteria. The positive predictive value (PPV) of GLT was calculated. Each of the subjects with an elevated PPV were then referred to determine the PPV of an elevated fasting FGM for GDM.

RESULTS: 22% (114/512) of subjects who had a GTT met positive criteria. Omission of the third hour GTT yielded a sensitivity of 99%/114. The PPV for a GLT ≥ 185 mg/dL was 62% (24/38) while a GLT >199 showed a PPV of 85% (9/11). While the number of subjects was small (n=9), all subjects with GLT >205 had a positive GTT. Of the 24 women with a FPG ≥ 105, 96% (23/24) had positive GTTs.

CONCLUSION: Omission of the 3 hour GTT measurement results in a failure to diagnose 15% of women with GDM. An elevated GLT is strongly associated with an abnormal GTT. A FPG ≥ 105 is a highly predictive of an abnormal GTT and may be an effective screen for GDM among pregnant women with an elevated GLT.

POPULATION IMPACT OF UNIVERSAL SCREENING FOR GESTATIONAL DIABETES. B M Casey, MJ Lucas, D D McIntyre, KJ Leveno, Dept OB/Gyn, Univ TX Southwestern Med. Ctr., Dallas, TX.

OBJECTIVE: To measure the impact of the introduction of universal screening for gestational diabetes on attributable outcomes.

STUDY DESIGN: A before-after analysis of obstetric outcomes related to gestational diabetes. Women enrolled for prenatal care during a one year period while selective screening was practiced, using the 50 g OGTT (threshold 140 mg/dL), were compared with a similar group of women after universal screening was instituted. Chi-square was used for statistical analysis.

RESULTS:

<table>
<thead>
<tr>
<th>Selective Screening</th>
<th>Universal Screening</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screening (1 year)</td>
<td>Screening (1 year)</td>
<td></td>
</tr>
<tr>
<td>Women delivered</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13,549</td>
<td>13,312</td>
<td></td>
</tr>
<tr>
<td>% Women 50 OGTT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31%</td>
<td>88%</td>
<td></td>
</tr>
<tr>
<td>Stillbirths</td>
<td></td>
<td></td>
</tr>
<tr>
<td>85 (6.0)</td>
<td>73 (5.5)</td>
<td>.06</td>
</tr>
<tr>
<td>Neonatal deaths</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41 (4.4)</td>
<td>56 (4.9)</td>
<td>.65</td>
</tr>
<tr>
<td>Shoulder dystocia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>85 (8.5)</td>
<td>106 (8.8)</td>
<td>.10</td>
</tr>
<tr>
<td>≥ 4000 g</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1138 (8.3)</td>
<td>1146 (8.4)</td>
<td>.35</td>
</tr>
</tbody>
</table>

CONCLUSIONS: Universal screening for gestational diabetes did not increase or decrease obstetric outcomes attributable to this diagnosis.
WHEN IS FASTING REALLY FASTING? THE INFLUENCE OF TIME OF DAY, TIME INTERVAL AFTER A MEAL, AND MATERNAL BODY MASS ON MATERNAL GLYCEMIA IN GESTATIONAL DIABETES

STUDY DESIGN: An identical 560 calorie mixed meal was administered on two separate occasions, one week apart, to 30 women with diet-treated GDM between 28 and 38 weeks gestation. One meal was administered at 0700 hours (morning meal) and the other at 2100 hours (evening meal), each after a fast of 24 hours. The order of the meals (morning vs evening first) was assigned randomly. Sixteen of the women had a body mass index (BMI) >27 kg/m² (overweight) and 14 women had a BMI < 27 kg/m² (lean). Venous plasma concentrations of glucose, insulin, free fatty acids (FFAs), beta-hydroxybutyrate (BOHB) and total and free cortisol were measured hourly for nine hours after the test meals.

RESULTS: Glucose concentrations after the morning meal were significantly higher at 1 hour, not different at 2 hours, and significantly lower from 3-9 hours postprandial vs those after the evening meal. Plasma BOHB and FFA concentrations were higher between 5-9 hours after the morning meal. Total and free cortisol levels were higher for the first 7 hours after the morning as compared with after the evening feeding, reflecting known diurnal variation in cortisol. Neither plasma insulin concentrations nor insulin/glucose ratios differed significantly at any time after morning vs evening meals. Whether the test meal was administered after the morning or the evening meal, the time point after which none of the hourly glucose values differed significantly from the final, 9-hour postmeal value, was 5 hours. There were significantly higher glucose values in the overweight vs the lean group 7 hours after the morning meal and 6-9 hours after the evening meal.

CONCLUSIONS: In lean and overweight women with diet-treated GDM glucose concentrations are significantly higher 5-9 hours after evening feeding, while suppression of FFA and BOHB is less sustained after morning feeding. The mechanisms underlying these differences remain to be determined, but may involve diurnal influences of counterregulatory hormones and changes in insulin resistance. The management of gestational diabetes may be assisted by the establishment of a finite duration of fasting and meal-specific pre-and post-prandial maternal glucose targets.

ABNORMAL POSTPARTUM GLUCOSE TOLERANCE FOLLOWING "PURE" GESTATIONAL DIABETES. A. Samadzadkh1, Y.Ezra2, S.Hadad2, S.Gassan1, U.Richalak1. Deps. Ob/Gyn, Sharar Zedek Medical Center, and Hadassah Medical Center, Jerusalem, Israel.

OBJECTIVE: To determine the incidence and the potential risk factors for abnormal carbohydrate metabolism in the postpartum period (up to three months), in women with "pure" gestational diabetes.

STUDY DESIGN: One hundred and fifty three consecutive women with gestational diabetes were prospectively enrolled to the study. All women performed first trimester fasting blood glucose, 50g glucose challenge test (OGTT), and 100g OGTT: "Pure" GDM was defined in women, having first trimester fasting blood glucose of < 105mg/dl and pathological OGTT (performed between 7-36 weeks gestation). Women were tested twice in the postpartum period for glucose intolerance by the 75g OGTT (2-6 days and 6-10 weeks postpartum period). All the study participants were tested in the metabolic diabetes clinics of both centers.

RESULTS: Sixty women with "pure" GDM were evaluated in the study. Twelve women were primiparous, 47 were multiparous, and 3 were grand-multiparous. Eight women were diagnosed as GDM at 7-20 weeks and 52 at 24-28 weeks. Seventy-six percent of the study population were managed initially with diet and home monitoring. Insulin was added if FBS >100 mg/dl or 2 hour postprandial (PP) values >120 mg/dl. All other parameters were not significantly different.

CONCLUSION: Women with "pure" GDM have no risk for developing diabetes in the immediate postpartum period, and therefore the need for postpartum OGTT is questionable.


STUDY DESIGN: From 1/1990-7/1995 FBS, type of therapy, birth weight (BW), and mode of delivery were retrieved from a diabetic data base. GTT FBS was normal (NL) if <105mg/dl and elevated (ABN) if >210mg/dl. All patients (pts) with GDM (2 elevated GTT values) were managed initially with diet and home monitoring. Insulin was added if FBS >100 mg/dl or 2 hour postprandial (PP) values >120 mg/dl. NL and ABN groups were also compared by type of therapy, diet (A1) or insulin (A2). Data analysis used ANOVA and Chi-square.

RESULTS: 1088 pts had GDM. GTT FBS was >105 mg/dl in 22% (242/1088). Insulin was used in 535 (128/242) with ABN FBS and 16% (137/846) with NL FBS (p<0.0001). Mean (±SD) BW was 3562g(±684) and 3209g(±642) with ABN FBS and NL FBS, respectively, (p=0.001). Corresponding rates of macrosomia (BW >4000 g) were 15% and 9% (p=0.02). Cesarean section (C/S) rate was not significantly different, 34% and 27% for ABN FBS and NL FBS, respectively, (p=0.08). Insulin use resulted in a significant decrease in mean BW with NL FBS (p<0.04), but not ABN FBS. Mean FBS and PP values were <90mg/dl and <110mg/dl, respectively, in all groups.

CONCLUSIONS: Only 50% of gravidas with ABN FBS required insulin based on glucose monitoring. However, good glucose control was still associated with increased BW and macrosomia. Although ABN FBS was not predictive for insulin use, its empiric initiation in this group may still be beneficial with regard to clinical outcome.

GESTATIONAL DIABETES (GDM): METABOLIC AND BLOOD SUGAR PARAMETERS IN SINGLETON Vs TWIN PREGNANCIES. D. Schwartz, Y. Daoud, P. Zazula, G. Goyert, R. Bronsteen, D. Wright, S. H. Copes. Wayne State University/Grace/Sinai Hospital, Detroit, MI.

INTRODUCTION: There is limited information regarding the impact of twin pregnancy on GDM with regards its frequency, metabolic effects and parameters of control. This study compared these items in twin and singleton pregnancies associated with GDM and carbohydrate intolerance (CI), as this information may assist in counseling and understanding the management of such patients.

MATERIALS & METHODS: The study population comprised all deliveries between 1/1/90 and 6/30/98. In patients with GDM and CI, the fasting and 2 hour postprandial blood sugar (BS) objectives were <100 mg percent and ≤120 mg percent respectively. Comparison between singleton and twin pregnancies included: frequency of GDM, maternal age and weight, values of the 1 hour sugar screen and 3 hour glucose tolerance test (GTT), post-treatment BS values, % patients requiring insulin and insulin dose. Statistical analysis included χ² and ANOVA.

RESULTS: There were 29,644 deliveries that included 1251 with GDM (4.2%), of which 36 were twin pregnancies. In twins, GDM was significantly increased (7.7 Vs 4.1%, p<0.05). In twin pregnancies, the maternal weight at first visit was significantly less, and the 3 hour GTT value was significantly greater than for singletons. All other parameters were not significantly different.

CONCLUSIONS: This study demonstrated both a significant increase in the incidence of GDM and disturbance of the 3 hour GTT in patients with twins. The observation that insulin requirements were not significantly different, appears to indicate that the management strategies that are required to achieve BS control in singletons are equally effective in twins. This information is of importance in patient counseling, and in the evaluation and management of the complex issues associated with twin pregnancies.

OBJECTIVE: To test whether fetal ultrasound (US) can help guide diabetes management in gestational diabetes (GDM) with fasting hyperglycemia.

STUDY DESIGN: 98 women with gestational diabetes (GDM) and fasting serum glucose of 108-129 mg/dl were randomized to 1 of 2 management strategies: the STANDARD arm (STD; n=49) received diet-plus-insulin treatment from the time of GDM diagnosis; the ULTRASOUND arm (US; n=49) received diet treatment and insulin only if a monthly fetal US revealed an abdominal circumference (AC) >70th percentile (%ile) for gestational age (GA) or weekly FSG >120 mg/dl. All patients performed self-glucose monitoring. Labor and delivery were managed by a standard protocol.

RESULTS: At entry, means of maternal age, OGTT glucose area and GA and fetal AC were similar. 30(61%) of the women randomized to US arm received insulin because fetal AC >70th %ile at the diagnosis of GDM (n=24) or became >70th %ile at the monthly US exam (n=6). Means of the GA at delivery (38.2 ± 38.4 wk.), birthweight (3271 ± 3569 g), large for GA rate (23% vs. 29%) and neonatal morbidity (23% vs. 28%) were not significantly different in the STD and US arms respectively. Of the 19 (39%) infants whose AC remained ≤ 70th %ile, only 2 (11%) were LGA at birth despite the lack of insulin therapy. Of the 30 infants whose AC was >70th %ile during pregnancy, 24 (78%) were LGA despite aggressive glycemic control. In the US group 1 infant was SGA (diet treated). In the STD group 3 infants were SGA.

CONCLUSIONS: When maternal fasting hyperglycemia (105-120 mg/dl) is present at the diagnosis of GDM, at-risk fetal growth was often already present and an excess of LGA infants was difficult to prevent with insulin therapy. However US detected 39% of women who did not require insulin to prevent LGA at birth and did not exhibit excess morbidity. Fetal US may be useful to help guide insulin management in GDM.

THERE IS NO ASSOCIATION BETWEEN ORAL HYPOGLYCEMIC USE AND FETAL ANOMALIES. O. Langer, D. Conway, M. Berkus, E.M.-J. Xenakis, Dept. of OB-Gyn, The University of Texas Health Science Center at San Antonio, San Antonio, TX.

OBJECTIVES: The use of oral hypoglycemic agents in pregnancy is currently contraindicated in the United States because of the fear of increased fetal anomalies and neonatal hypoglycemia. Therefore, we sought to test the hypothesis: the rate of anomalies in oral hypoglycemic treated patients is similar to that of insulin treated patients and anomalies are glucose and not treatment dependent.

METHODS: 475 type 2 diabetic patients participated in the study: 82 treated with oral hypoglycemic agents, 239 diet alone and 154 insulin treated prior to pregnancy and during the first 9 weeks of pregnancy. Blood glucose levels were evaluated in all 3 groups prior to initiation/change to insulin therapy using self-monitoring blood glucose 7x daily. At delivery, all neonates were examined to identify anomalies.

RESULTS: The incidence of anomalies was comparable for the 3 groups: oral hypoglycemic agent 8.5%; diet alone 7.1%; insulin treated 13% with an overall rate of 9.5% anomalies in all patients. When oral hypoglycemic patients were stratified to I placenta-crossing (eg., Metformin) and II non-placenta-crossing (e.g., glyburide) similar rates of anomalies were found. A summary of the blood glucose results are as follows:

<table>
<thead>
<tr>
<th>Pre-treatment</th>
<th>Fasting</th>
<th>Pre-Meal</th>
<th>Post-Meal</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anomaly</td>
<td>149±55</td>
<td>14±47</td>
<td>15±46</td>
<td>15±46</td>
</tr>
<tr>
<td>No Anomaly</td>
<td>128±65</td>
<td>12±54</td>
<td>13±34</td>
<td>12±2±69</td>
</tr>
</tbody>
</table>

CONCLUSION: Our data suggests that the use of oral hypoglycemic agents prior to pregnancy and during the first trimester is not associated with an increased rate of anomalies. The data further demonstrates that higher thresholds of glycemia than found in the blood glucose of non diabetic patients will prevent anomalies.


OBJECTIVE: To evaluate perinatal outcome and glycemic control following qid vs. bid insulin injection for patients with gestational diabetes mellitus (GDM) and with pre-GDM (PGDM).

STUDY DESIGN: Randomized prospective comparative, designed to detect reduction of perinatal morbidity from 30% and 50% to 15% and 25% in GDM and PGDM in singleton pregnancies, respectively (power 0.05, power 0.8). Thus, 138 GDM and 58 PGDM patients received the protocol, vs. 150 and 60, respectively. For GDM patients insulin was begun when pre-prandial, 2h postprandial or mean daily glucose exceeded 9 mg/dl, 120 mg/dl and 95 mg/dl, respectively. Blood glucose was measured 6 times a day at least once a week, in order to keep mean daily glucose of 0 mg/dl, 95 mg/dl.

RESULTS: The respective groups were similar in background characteristics. The daily insulin dose given before birth in the qid-GDM group was higher than in the bid-GDM group (65±80 vs 48±84, P<0.02), and in the PGDM groups (120±84 vs 92±54, P=0.01), respectively. Glycemic control with qid was better than with bid protocol: GDM - 97.5±7.9 vs. 100.9±8.7 mg/dl, P=0.02; HbA1c 5.5±1.0 vs. 5.8±1.0, P=0.01; fructoseamine 188±37 vs. 229±43 µmol/L, P=0.001, respectively. PGDM - 98.5±14.1 vs. 106.4±15.3 mg/dl, P=0.005; HbA1c 6.2±1.3 vs. 6.5±1.8, P=0.03; 310±35 vs. 261±62 µmol/L, P=0.001, respectively. There was no difference in maternal severe hypoglycemic events, CS, premature birth, LGA infants, macrosomia and low Apgar scores. The qid protocol resulted in lower rate of hyperbilirubinemia and hypoglycemia compared to bid protocol in GDM mothers (11 vs. 21%, P=0.02) and 1 vs. 1%, P=0.04, respectively, and lower rate of hypoglycemia in infants to PGDM mothers (4 vs. 3%, P=0.005).

CONCLUSION: Insulin administration qid in pregnancy improved glycemic control and perinatal outcome without risking the mothers compared to bid administration.
**SELECTIVE POSTPARTUM GLUCOSE TESTING IN GESTATIONAL DIABETES: CAN OUR TESTING SCHEME BE IMPROVED?**

**OBJECTIVE:** To determine the combinations of pregnancy-related factors that can predict presence or absence of postpartum glucose intolerance in women with gestational diabetes (GDM) who underwent an oral 2-hour glucose tolerance test (PGTT) after delivery. We assessed the performance of independent risk factors (by logistic regression) in predicting presence or absence of postpartum glucose intolerance in GDM women.

**RESULTS:** A PC-R of 0.25 correlated with a measured proteinuria of <300 mg/24 hours. Using serum creatinine, the modified Cockcroft-Gault formula based on a single serum creatinine, the protein/serum creatinine ratio of 0.25 is associated with <300 mg of urinary protein/24 hours. Using the modified Cockcroft-Gault formula, the protein/serum creatinine ratio of 0.25 is significantly different between IDDM women with good or poor glycemic control. HbA1c values should not be used to predict the presence of glycosuria or absence of PG in the amniotic fluid.

**CONCLUSIONS:** In insulin-dependent diabetic (IDDM) pregnancies, fetal pulmonary maturity is delayed in the presence of suboptimal glycemic control. HbA1c values should not be used to predict the presence of glycosuria or absence of PG in the amniotic fluid.
THE ASSOCIATION BETWEEN UNEXPLAINED MIDTRIMESTER MATER- 
INAL SERUM HUMAN CHORIONIC GONADOTROPIN LEVELS AND AD-
VERSE PREGNANCY OUTCOMES: A SYSTEMATIC REVIEW AND EX-
PLANATORY META-ANALYSIS. CI Onyeije, DM Sherer. Dept of OB/GYN, 
Albert Einstein College of Medicine, Bronx, NY.

OBJECTIVE: To evaluate whether elevated levels of human chorionic 
gonadotropin (hCG) detected during second trimester screening are 
consistently associated with adverse pregnancy outcomes.

STUDY DESIGN: A prespecified protocol was utilized to identify and 
systematically review all published studies regarding pregnancy outcomes 
in patients after having hCG levels drawn in the second trimester. A 
MEDLINE literature search of English-language studies was performed,
systematically reviewing published studies regarding pregnancy outcomes. 
Eighteen studies which reported these pregnancy outcomes in the context of previously determined hCG levels were 
identified. Methodological quality scores were assigned by blinded 
reviewers. Reported perinatal outcomes that were not pre-specified were 
stratified whether or not patients met the IOM guidelines. Statistical analysis included chi square and Student's t tests where appropriate.

RESULTS: Among our population of non-obese gestational diabetics, 
20% failed to achieve the Institute of Medicine recommendations for 
weight gain while more than 50% exceeded the recommendations. 
Average BW as percent weight gain increased from below (3043 +/- 76 gms) to within (3290 +/- 1052 gms) to above (3387 +/- 885 gms) the recommended range. Compared to other BMI categories, GDMs with a BMI > 30 kg/M2 who failed to achieve IOM recommendations for weight gain had the lowest average BW (2570 +/- 683 gms vs. 3480 +/- 832 gms, p < 0.001) and the highest rate of fetal growth restriction (42.9% vs. 11.1%, p < 0.001). Although average BW increased with pregestational weight, we did not see a statistically significant increase in macrosomic patients who exceeded IOM Guidelines.

CONCLUSIONS: The IOM guidelines for weight gain in pregnancy have 
limited application in patients with gestational diabetes mellitus. In order to 
reduce the incidence of FGR in GDMs with low BMI, their pregnancy 
weight gain should at least meet the IOM recommendations of 12.5 kg.

OBJECTIVE: Previous non-pregnant research (Kahn '93) has shown that a reciprocal relationship exists between insulin sensitivity (S1) and β-cell function. Such an inverse relationship has never been shown in pregnancy. We hypothesize that for any difference in S1, a proportionate reciprocal difference occurs in insulin levels and responses in pregnancy as well.

METHODS: Bergman Minimal-Model technique, modified with insulin injection at 20 minutes, was used to determine S1 and β-cell function in 20 non-diabetic gravidas at 26-32 weeks gestation. 20 glucose/insulin samples for each subject were taken over 3hrs and glucose measured by glucose oxidase method (C.V. 2.9%) and insulin with a double antibody technique (sens. 0.252 u/mL, C.V. 46%). Subjects were studied for S1, first phase (Φ1) (0-19min), and second phase insulin response (Φ2) (20-360min).

RESULTS: Relationship between Φ1 & S 1 were shown below. S1 and: (1) body mass index & fasting insulin were related curvilinearly; (2) Φ1 & Φ2 were reciprocally related in a hiperbolic fashion, similar to nonpregnancy results.

CONCLUSION: A negative feedback loop modulating the interaction between S1 & β-cell function was determined. This normal standard will allow separation of abnormal subjects, making possible targeted followup and therapeutic intervention to delay or prevent the onset of overt diabetes.
109 REDUCED PROSTACYCLIN PRODUCTION IN PREGNANCIES COMPLICATED BY DIABETIC VASCULOPATHY. CL Regan*, Morgan MA, Lawson P, FitzGerald GA, Dept of Obstetrics and Gynaecology and Center for Experimental Therapeutics, University of Pennsylvania Medical Center, Philadelphia, PA.

OBJECTIVE: To investigate whether systemic prostacyclin (PGI2) formation is reduced in diabetic pregnancies complicated by vascular disease.

STUDY DESIGN: Levels of 2,3-dinor-6-keto PGF1α, the stable urinary metabolite of PGI2, were determined in five pregnant patients with class D, R or F diabetes mellitus and compared with levels from eighteen normal pregnant control subjects using a stable isotope dilution technique. Urine was spiked with deuterated internal standard, extracted under alkaline and superimposed pre-eclampsia seen in this group supports this hypothesis.

RESULTS: A significant reduction in PGI2 formation was seen in pregnancies complicated by class D, R or F diabetes mellitus (median 189 pg/mg, cases vs 905 pg/mg, controls, p=0.0002). Of the five diabetic pregnancies studied, one woman had an elective termination of pregnancy and one had an uncomplicated delivery at term. All remaining patients developed pre-eclampsia prior to delivery (60%).

CONCLUSIONS: A failure of the normal pregnancy associated augmentation of prostacyclin formation is seen in patients with pregestational diabetes complicated by vascular disease. This may reflect underlying endothelial damage in this population. The high rate of superimposed pre-eclampsia seen in this group supports this hypothesis.

110 ECTOPLACENTAL CONE OUTGROWTH OF THE PREGNANT RAT IS REDUCED IN A DIABETIC ENVIRONMENT. S Caluwaerts, X Van Assche, Dept of Obstetrics and Gynaecology, University Hospital Gent, Belgium.

OBJECTIVE: In diabetic rats, abnormal development of the placenta may affect the transfer of compounds between mother and fetus. We evaluated the attachment, proliferation, differentiation and surface area outgrowth of the placental primordium, the ectoplacental cone (EPC), in an in vitro model.

STUDY DESIGN: Severe diabetes in Wistar rats was induced by the injection of 56 mg/kg body weight streptozotocin on the day of the copulation plug (= day 1). EPCs from 9 control and 9 diabetic rats were dissected at day 9 of pregnancy and cultured in either DMEM + 10% FCS (control medium) or in medium containing 16.5 mM glucose (high glucose medium). The relaxation in rings from day 22 rats was significantly less (p<0.005) when using diabetic rat EPCs in high glucose medium (P<0.005). Attachment and outgrowth of control rat EPCs were similar in control and high glucose media. The attachment and outgrowth of diabetic rat EPCs in control medium showed no significant difference with control rat EPCs in control medium.

Proliferation was significantly stimulated (P<0.005) when using diabetic rat EPCs or high glucose medium. There was no significant difference in the numbers of trophoblast giant cells.

CONCLUSION: These data indicate that attachment and outgrowth of the diabetic rat EPC in vitro is negatively influenced by high glucose concentrations.

111 INFLUENCE OF DIABETES UPON PLASMA CORTICOSTEROIDS AND THEIR REGULATION, AND ADRENERGIC/CORTIKETAL GENE EXPRESSION IN NONPREGNANT AND PREGNANT RATS. MP Malea and K-Y Wu, Dept of Obstetrics and Gynaecology, Brown University, Providence, RI.

OBJECTIVE: Examine the effect of chemical (streptozotocin; STZ) diabetes, uncontrolled (DM) and insulin-treated (DM+) on plasma corticosteroids and their regulation by the hypothalamic-pituitary-adrenal (HPA) and renin-angiotensin system (RAS), and on adrenocortical gene expression, in nonpregnant (NP) and pregnant (P) rats.

STUDY DESIGN: Plasma corticosteroids, aldosterone (Al), glucose (Gl), insulin on routine, exogenous deoxymethasone (Dex) and low salt diets, as well as the relative abundance of mRNAs for P450, P450c11B and P450c11A5 were determined in NP and day 21 timed-pregnant and DM. Comparisons were made by the Student's t-test, P<0.05 considered significant.

RESULTS: Glc levels in NP DM- and P DM- rats were sig greater than controls, and normalized with insulin treatment. Cort levels paralleled levels of glycemia. Untreated STZ-DM were insulinopenic. Preg was accompanied by hyperalgesia in control, DM- and DM+ groups, within which Aldo levels were sig greater in the DM- group. Dex diet was accompanied by decreases in Aldo and Cort, whereas low salt increased Aldo. The relative abundance of P450c11B mRNA, which encodes cholesterol side-chain cleavage enzyme, were comparable in all groups, whereas P450c11A5 mRNA, which encodes 11β-hydroxylase, was greater in the nonpregnant control and DM+ groups.

CONCLUSIONS: STZ-DM is associated with chronic stressor in stock rats, underlying differences in the regulation of adrenocortical activity in insulin treated DM and regulation of corticosteroids is not exclusively at the level of gene expression.

112 INHIBITION OF VASCULAR CONTRACTILITY BY MAGNESIUM SULPHATE DURING PREGNANCY IS MEDIATED BY NITRIC OXIDE. M. Longo, L. Vimercati, M. Zunino, E. Vedermakov, G. Saade, R. Chezalas, F. Facchetti, R. Garfinkel*, Deps. of OB/GYN, The Obstetric Unit, Galveston, TX and Univ. of Modena, Italy and Schering AG, Berlin, Germany.

OBJECTIVE: To investigate the role of nitric oxide (NO) in the vascular effect of magnesium sulphate (MgSO4).

STUDY DESIGN: Three millimeter segments of the aorta from day 16~22 pregnant rats were mounted in organ chambers for measurement of isometric tension. Cumulative concentration-responses to MgSO4 were determined in control rings or rings denuded of endothelium (E-), incubated with the nitric oxide synthase inhibitor L-NAME (10−4 M), the cyclooxygenase inhibitor indomethacin (10−5 M) or the cyclooxygenase inhibitor indo methacin (10−5 M). The response to MgSO4 was calculated as a % relaxation from the pre-contraction with phenylephrine (10−4 M). In a second series of experiments, minimally-effective concentration of MgSO4 (3x10−4 M) or the cGMP analogue 8-bromo-cGMP (10−4 M) or the nitric oxide donor sodium nitroprusside (SNP, 3x10−4 M) were respectively added to rings treated with E- and L-NAME, or to the de-endothelized rings before the responses to MgSO4 were determined. Student's t-test or one-way ANOVA followed by Newman-Keuls tests were used as appropriate (p<0.05).

RESULTS: MgSO4 relaxed the aortic rings in a concentration dependent manner. The relaxation in rings from day 22 rats was significantly less that in rings from day 16 rats. Removal of the endothelium, L-NAME, L-NMMA and indomethacin significantly decreased the relaxant effect of MgSO4 in aortic rings from day 16 (Fig 1) but not day 22 rats. Replacement of the inhibited product (SNP in E- and L-NAME treated (Fig 2) rings and cGMP in LY- treated rings) restored the response to MgSO4.

CONCLUSION: MgSO4 relaxes vascular smooth. This effect is gestational-age dependent. NO, cGMP, cyclooxygenase products and the endothelium play a role in the vascular effects of MgSO4. The classical effects of MgSO4 may be related to its actions in maternal and fetal vascular beds. These effects may be modulated by gestational age dependent or pathologic changes in the NO-cGMP, cyclooxygenase systems, as well as therapeutic interventions aimed at these systems.
115 RELATIVE CONTRIBUTION OF INTERSTITIAL AND ENDOVASCULAR TROPHOBLAST TO ELASTICA BREAKDOWN IN PLACENTAL BED SPINAL ARTERIES. P. Pyrupentug, L. Voepay, L. Vos, & Fa Van Assche. Dept Obstet. Gynecol., University Hospital Gasthuisberg, B3000 Leuven, Belgium

OBJECTIVE: Loss of elastica in spiral arteries during pregnancy is associated with endovascular invasive trophoblast (EnDoT) during the normal physiological conversion of these vessels. The possible role of interstitial trophoblast (IT) in spiral artery disruption is less clear. In preclampsia (and other complications) IT invades the myometrium while EnDoT invasion is restricted, which allows to discriminate the effect of both trophoblast populations on vascular integrity.

STUDY DESIGN: Placental bed biopsies were selected which contained myometrial spiral arteries with absent (N = 11, all preclampsics), or incomplete physiological change, i.e. occurring over part of the circumference of the vessels (N = 6, comprising 2 preclampsics). The nonproteinuric pregnancy-induced hypertensive and 3 diabetic patients).

RESULTS: In non-invaded arteries (no EnDoT) elastica was completely present. Weak elastica staining was related to high levels of IT (P<0.05) and particularly to the presence of perivascular IT (P<0.001). Arteries with hyperplastic media showed more often weak elastica staining (P<0.001). In arteries with incomplete physiological change, staining was either completely absent, or only present in areas not invaded by EnDoT. Final elastica removal was not related to the IT score or perivascular IT.

CONCLUSIONS: IT, and in particular perivascular IT, induces weakening of the elastica. However, final removal of elastica is affected by EnDoT during normal physiological vascular change. In preclampsia, where EnDoT is restricted, elastica weakening contributes to vascular disorganization which may trigger compensatory hyperplasia of the media.

116 EXPRESSION OF FAS LIGAND BY PREECLAMPTIC PLACENTA. C.D. Hsu, L.S. Gutierrez, E. Meadough, H. Basherra, L.C. Lo, J.A. Copel, H. Harirah, G. Mor. Dept. Ob/Gyn, Yale University School of Medicine, New Haven, CT.

OBJECTIVE: In normal pregnancy, maternal T cells are activated and promptly undergo apoptosis through appropriate expression of Fas ligand (FasL) by trophoblasts for peripheral immune tolerance. We sought to determine whether inappropriate expression of FasL could be occurring in the placenta of preeclampsia.

STUDY DESIGN: Human placental tissues were obtained from patients with preeclampsia (n=8) and normotension (n=5). FasL expression was confirmed as proteomic hypertension and hyperuricemia (>= 5.5 mg/dl). A rabbit polyclonal anti-human FasL antibody was used as the primary antibody, followed by avidin-biotin immunoperoxidase localization. FasL expression was blindly quantified by investigators based on immunostaining intensity (a scale of 0 to 3). Mann-Whitney U test was used for statistical analysis. Data are expressed as medians with ranges.

RESULTS: There were no significant differences in maternal age, gestational age, parity, and race between preeclamptic and normotensive pregnant women. In normal pregnancy, FasL was intensely expressed in the placental villi (median intensity scale: 5 (2 to 3)). In contrast, FasL expression was significantly reduced in preeclamptic placental villi (median intensity scale: 1 (0 to 5), P<0.018).

CONCLUSIONS: Our data suggest that appropriate expression of FasL in the placenta may be responsible for the maternal immune tolerance in normal pregnancy. Reduction of FasL expression in the placenta may lead to a faulty placental occurrence in preeclamptic pregnancies. We conclude that abnormal FasL expression by placenta may play an important role in the pathogenesis of preeclampsia.

SULFATE, P. V. Aud, Dept. of Modena, e vascule day 16 a e ment SO2, e cmum (E), the oxygenes ealede, b 1 M, the or carboni e hulled with a gas mixture containing 2.5 % O2 and 8 % CO2 in air. After stabilation at 2 cm passive tension, response contraction to KCl (60 mM) was obtained. The rings were then re-equilibrated and responses to cumulative concentrations of 10^-6 to 10^-1 M of cholic (CA) and chenodeoxycholic (CDCA) acids were determined in rings at passive tension and rings pre-contracted with serotonin (5-HT, 10^-7 M) or KCl (60 mM). In a second set of experiments, vessels were incubated for one hour and 23 hours with either CA (5 x 10^-6 M) or CDCA (10^-5 M) or combination and dose response curves to 5-HT were then determined. The results were expressed as a percentage of the KCl reference contraction.

RESULTS: Addition of cumulative concentrations of CA and CDCA into the organ chambers did not have direct contractile or relaxant effect on umbilical artery or vein. Incubation with biliary acids for up to 24 hrs had no effect on responses of umbilical artery or vein to cumulative concentrations of 5HT (Figs).

OBJECTIVE: In normal pregnancy, maternal T cells are activated and promptly undergo apoptosis to adapt immune tolerance. Soluble Fas (APO-1) is generated by alternative mRNA splicing and tends to protect maternal T cells from apoptosis. We sought to determine whether serum sFas/APO-1 was altered in preeclampsia.

STUDY DESIGN: Eighteen pregnant women with preeclampsia were matched with 18 normotensive women. Subjects were matched for gestational age, maternal age, parity and race. Preeclampsia was defined as proteinuria and hypertension and hyperuricemia (>5.5 mg/dl). Serum levels of sFas/APO-1 were determined by enzyme immunoassay. Paired-comparison t-test and conventional correlation coefficients were used for statistical analyses. Data are expressed as mean ± SE.

RESULTS: Serum levels of sFas/APO-1 were significantly higher in preeclampsia than in normotensives (9.14 ± 0.94 vs 6.98 ± 0.29 U/ml, p=0.02). Serum sFas/APO-1 levels were significantly correlated with serum AST (r=0.64) and ALT (r=0.65) levels in preeclampsia. The patient with HELLP syndrome tends to have a higher level of sFas/APO-1. There were no significant correlations between serum sFas/APO-1 and maternal age, gestational age, parity, race, blood pressure, hematocrit, platelet, proteinuria, serum uric acid, or creatinine.

CONCLUSIONS: Our data suggest that elevated sFas/APO-1 may prevent maternal T cell apoptosis and, consequently, lead to maternal immune intolerance noted in preeclampsia. The role of sFas/APO-1 in hepatic disorders, such as HELLP syndrome remains to be determined.

118 UMBILICAL CORD BLOOD CONCENTRATIONS OF NITRIC OXIDE METABOLITES ARE HIGHER IN PREECLAMPSIA WITH INTRAUTERINE GROWTH RESTRICTION, BUT NOT IN PREECLAMPSIA OR INTRAUTERINE GROWTH RESTRICTION ALONE. C.D. Hsu, S.F. Hong, J.A. Copel. Dept. Ob/Gyn, Yale University School of Medicine, New Haven, CT.

OBJECTIVE: To determine whether umbilical cord blood levels of nitric oxide metabolites (NOx) differ amongst preeclampsia with intrauterine growth restriction (PET/IUGR), preeclampsia (PET), intrauterine growth restriction (IUGR), and normotensive pregnant women.

STUDY DESIGN: Sixty-five patients were studied: 20 pregnant patients with PET, 10 in IUGR, 20 matched normotensive patients, 20 patients with preeclampsia, 20 matched normotensive patients without uncomplicated pregnancies, and 10 preeclamptic women without proteinuria or hypertension. Samples were assayed for sVCAM-1 and sICAM-1 by specific enzyme-linked immunoabsorbent assay.

RESULTS: There were no significant differences in maternal age, parity, gestational age, and race amongst the four groups. Umbilical cord blood levels of NOx were significantly higher in patients with PET/IUGR than those in PET, IUGR, or normotensive patients (47.1 ± 3.2 vs. 25.0 ± 5.4 vs. 20.7 ± 0.9 vs. 25.1 ±1 ±1 µM, p<0.0001). However, there were no significant differences amongst PET, IUGR, and normotensives.

CONCLUSIONS: The pathophysiological changes seen in PET/IUGR may differ from those with PET or IUGR alone. Increased umbilical cord blood NOx levels in PET/IUGR may suggest a compensatory response to offset the decreased uteroplacental circulation in this setting.

119 SOLUBLE VASCULAR AND INTERCELLULAR CELL ADHESION MOLECULE-1 IN PREECLAMPSIA. Y. Dong, M.J. Kupferminc, A. Baram, E. Gafni, J.B. Lessing. Dept. Ob/Gyn, Lis Maternity Hospital, Tel Aviv Sourasky Medical Center, Sackler School of Medicine, Tel Aviv University, Israel.

OBJECTIVE: Adhesion molecules play a major role in inflammatory and immune reactions. These molecules are involved in implantation and trophoblast vascular invasion. Preeclampsia is associated with abnormal trophoblast invasion and is accompanied by unregulated inflammatory and immune reactions. The study was conducted to determine whether altered plasma levels of soluble vascular and intercellular cell adhesion molecules (sVCAM-1 and sICAM-1) are involved in the pathogenesis of preeclampsia.

STUDY DESIGN: Maternal plasma samples were collected from 20 patients with preeclampsia, 20 matched normotensive patients with uncomplicated pregnancies, and 10 nonpregnant women. Samples were assayed for sVCAM-1 and sICAM-1 by specific enzyme-linked immunoabsorbent assay.

RESULTS: All values are mean ± SD and in ng/ml; *Preeclampsia vs normotensive pregnancy and nonpregnant; † Preeclampsia and normal pregnancy vs nonpregnant.

CONCLUSIONS: The selective increased plasma levels of sVCAM-1 in preeclampsia provide evidence for endothelial activation, suggest distinct pathways for neutrophil and endothelial activation, and support the inflammatory process that accompanies the disease.

120 THE PROTHROMBIN GENE MUTATION IS ASSOCIATED WITH POOR OUTCOMES. M.J. Kupferminc, A. Manz, A. Eldor², M. Shenhar¹, J. Choen², A. Baram, J.B. Lessing. Dept. Ob/Gyn, Lis Maternity Hospital, Tel Aviv Sourasky Medical Center, Sackler Faculty of Medicine, Tel Aviv University, Israel.

OBJECTIVE: A recently described mutation of the prothrombin (Factor II) gene, a G->A transition at codon 20210, is associated with increased risk for venous thromboembolism, myocardial infarction and cerebral-vein thrombosis. This study describes the obstetric complications observed in women who were carriers of the Factor II20210 mutation.

STUDY DESIGN: During a period of 20 months, 200 patients who had obstetric complications were screened for the occurrence of thrombophilia. 24 patients (12%) were found to be carrying the recent described Factor II20210 mutation.

RESULTS: In total, there were 48 abnormal and 6 normal pregnancies

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pre-eclampsia</th>
<th>Normal pregnant</th>
<th>Non-pregnant</th>
</tr>
</thead>
<tbody>
<tr>
<td>sVCAM-1*</td>
<td>1831±534</td>
<td>1254±386</td>
<td>1094±294</td>
</tr>
<tr>
<td>sICAM-1*</td>
<td>303±72</td>
<td>301±66</td>
<td>234±43</td>
</tr>
</tbody>
</table>

*All values are mean ± SD and in ng/ml; ** Preeclampsia vs normotensive pregnancy and nonpregnant; † Preeclampsia and normal pregnancy vs nonpregnant

CONCLUSIONS: The prothrombin gene mutation is associated with poor obstetric outcome.
12 EFFECT OF SEIZURE ACTIVITY ON MATERNAL RAT BRAIN HISTOPATHOLOGY. M Halahal, WJ Kupski*, JW Hota*, JB Evans*. Dept. of Ob/Gyn, Wayne State University School of Medicine, Detroit, MI.

OBJECTIVE: To determine whether seizure activity during pregnancy is associated with histopathologic brain changes in maternal rat brain, and the possible protective role of magnesium sulfate (MgSO4) administration.

STUDY DESIGN: Rats had an electrode stereotaxically implanted into the hippocampus. One week of recovery was allowed prior to breeding. Pregnant rats were randomly assigned to one of 6 groups: saline & seizure (n=5), saline & no seizure (n=2), saline & no surgery (n=2) vs. MgSO4 & seizure (n=4), MgSO4 & no seizure (n=1), and MgSO4 & no surgery (n=1). On gestational days 9, 11, 13, 15, 17, and 19 (term=21 days), a subcutaneous loading dose of MgSO4 or saline was injected, and a maintenance dose was administered every 20 minutes for 4 hours (followed by a 2nd loading dose). Seizures were induced after last injection. Rats were perfused with formalin at 20 days' gestation, brains were obtained and embedded in paraffin, sectioned in coronal plane and stained with H&E. Histologic grading was performed by a trained neuropathologist blinded to the protocol. Grading included extent of cellular damage within regions (isolated, laminar, diffuse), the nature of cell damage (cell shrinkage, nuclear pyknosis, cytoplasmic hypereosinophilia, and karyorrhexis), as well as reactive changes (inflammation, nuclear hyperplasia, and gliosis). Ten brain regions were examined, including cortex (frontal and parietal lobes, entorhinal), white matter (frontal and parietal lobes), hippocampus (pyramidalis, dentate gyrus), basal ganglia, thalamus, and hypothalamus. Results were analyzed using non-parametric statistics.

RESULTS: The histology of the white matter, basal ganglia, and thalamus revealed no changes as a result of seizure activity. Some type of neuronal necrosis, mainly isolated, patchy and laminar, were seen in the cortex, hippocampus, and the hypothalamus. However, this study did not find statistically significant differences among the control and study groups.

CONCLUSIONS: Seizure activity throughout pregnancy was not associated with significant histologic changes in the pregnant rat brain.

123 CENTRAL INHIBITORY-ANTI-SEIZURE ACTION OF MAGNESIUM SULFATE INCREASES WITH GESTATIONAL AGE. Mordeah Halahal, John W. Hota*, Joshua B. Evans*. Dept. of Ob/Gyn, Wayne State University School of Medicine, Detroit, MI.

OBJECTIVE: To determine whether peripherally administered magnesium sulfate (MgSO4) has central inhibitory, anticonvulsant action in pregnant rats, and to evaluate its association with gestational age (GA).

STUDY DESIGN: Bipolar electrodes were stereotaxically implanted into the hippocampus of non-pregnant rats one week prior to breeding. Pregnant rats were randomly assigned to saline (n=11) or MgSO4 (n=13) injection groups. On gestational days 9, 11, 13, 15, 17, and 19 (term=21 days), a subcutaneous loading dose of MgSO4 or saline was injected, and a maintenance dose administered every 20 minutes for 4 hours (followed by a 2nd loading dose). This was followed by stimulation and seizure induction. Rats were placed into a chamber and leads from a polygraph were attached to the implanted electrode. Electroencephalographic (EEG) recording was performed during stimulation with increasing intensity until the first epileptiform seizure was achieved. Two threshold stimulation was then given to induce a behavioral seizure. EEG recordings and behavioral changes were evaluated using two way ANOVA.

RESULTS: The threshold for electrically stimulated hippocampal seizure in the pregnant rat was higher in the MgSO4 group as compared to controls (p<0.01). Advanced GA was significantly associated with increased seizure threshold in the MgSO4 group (p<0.001). Significant interaction effect between treatment with MgSO4 and GA was also seen in the time elapsed from electrical stimulation to the onset of behavioral seizure (p<0.05). No statistically significant differences were detected between groups in primary/secondary or electrical/behavioral seizure duration and severity.

CONCLUSIONS: More intense electrical stimulation was required to induce electric and behavioral seizures in pregnant rats pretreated with MgSO4. This central inhibitory, anti-seizure effect of magnesium increased with GA. Furthermore, GA in MgSO4 administered pregnant rats was associated with longer intervals to the onset of behavioral seizures.

124 MAGNESIUM INHIBITS SEIZURE INDUCED RISE IN N-METHYL-D-ASPARTATE RECEPTOR BINDING IN PREGNANT RAT BRAIN. M Halahal, JW Hota*, JB Evans*. Dept. of Ob/Gyn, Wayne State University School of Medicine, Detroit, MI.

OBJECTIVE: To evaluate the effect of seizure on N-Methyl-D-Aspartate (NMDA) receptor binding in maternal rat brain, and whether peripheral administration of magnesium sulfate (MgSO4) can decrease this effect.

STUDY DESIGN: Rats were stereotaxically implanted with a bipolar electrode into the hippocampus. One week of recovery was allowed prior to breeding. Pregnant rats were randomly assigned to one of four groups (see table). Subcutaneous doses of saline or MgSO4 were administered every 20 minutes for 4 hours (loading maintenance-loading) to all rats on gestational days 9, 11, 13, 15, 17, and 19. Study groups (saline & MgSO4) were subsequently stimulated and seizures induced. At GD 20, rats were perfused and brains dissected. Cryostat sections were taken, labeled by [3H]-Glutamate (NMDA recognition site agonist) or [3H]-MK-801 (NMDA receptor antagonist), and mounted on Hyperfilm® for 4 weeks. Optical density measurements of binding in 12 brain regions on each section were performed. Statistics included one and two way ANOVA.

RESULTS: Seizure activity was associated with increased NMDA receptor binding of glutamate in pregnant rat brain (p<0.0001). Pre-administration of MgSO4 significantly reduced this effect. No seizure/treatment effects were seen in the binding of MK-801 except in the thalamus.

<table>
<thead>
<tr>
<th>Brain Region</th>
<th>Saline &amp; Seizure (n=5)</th>
<th>MgSO4 &amp; Seizure (n=5)</th>
<th>Saline &amp; No Seizure (n=9)</th>
<th>MgSO4 &amp; No Seizure (n=9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saline Binding (Mean ± SD)</td>
<td>82.9 ± 6.40</td>
<td>79.9 ± 6.47</td>
<td>117.4 ± 8.31</td>
<td>104.9 ± 7.18</td>
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</tbody>
</table>

CONCLUSIONS: The mechanism for maternal rat brain injury due to seizure activity may be, at least in part, associated with increased NMDA receptor binding of its agonist. Administration of MgSO4 can inhibit this effect, and may reduce resultant maternal brain damage.

125 STABILITY AND STRUCTURE OF HUMAN CHORIONIC GONADOTROPIN (hCG) IN NORMAL AND PRE-ECLAMPTIC PREGNANCIES. M. Khra, L. Cole*. Dept. Ob/Gyn, Yale University School of Medicine, New Haven, CT.

OBJECTIVE: To determine whether the human chorionic gonadotropin (hCG) in normal and pre-eclamptic (PPE) pregnancies are not structurally different and therefore dissociate at the same rate.

STUDY DESIGN: Blood from three patients with severe pre-eclampsia in the third trimester and from six non-pre-eclamptic patients, also in the third trimester, were obtained for the study. There was no statistically significant difference between the demographics of the two groups. The specimens were processed immediately. Antibiotics (penicillin, streptomycin, fungizone) and 0.4% sodium azide were added to sera. One milliliter of sera from each patient was incubated at 37°C. One hundred microliters from each sample were removed at 0, 6, 12 and 24 days. At the end of the study period, the total hCG and free β subunit concentrations were analyzed in each sample by immunor assay. Results were compared using the student t test.

RESULTS: As expected from previous studies, hCG levels at Day 0 were nearly four times higher in Pe compared to NPe. Additionally, the free β hCG levels were also consistently fourfold above that of the study group. When taken in the context of total hCG levels, however, the molar per cent of free β hCG in the initial serum sample of NPe pregnancies and PPe pregnancies were not statistically significant (1.46% ±0.72% and 1.14% ±0.35% respectively). Similarly, the percent dissociation of free β hCG per day in NPe and PPe pregnancies were 1.5% ±0.28% and 1.6% ±0.20% respectively. The overall mean percent free β subunit (mole/mole) was 1.36% ±0.62% which was comparable to the overall mean percent dissociation per day of 1.53% ±0.29%.

CONCLUSIONS: Even small changes in the peptide or oligosaccharide structure of hCG destabilize this molecule. As the rate and degree of dissociation of Pe and NPe were nearly identical, no significant difference in stability can be suggested. Our results confirm those of others reporting concentrations of free β hCG being 1.5% mole/mole throughout pregnancy. This amount most likely is accounted for by the continuous dissociation of hCG at 37°C in vivo and not principally by degradation in vivo production by trophoblasts.
125 SMOKING, PLACENTAL SIZE AND PREGNANCY-INDUCED HYPERTENSION AMONG PRIMIGRAVIDA J. Zhang,* M. Klebanoff,** R. Levine,*** P. Moyer,‡‡‡ Epidemiology Branch, NICHD/NIH Bethesda, MD

OBJECTIVE: To examine the association between maternal smoking, placental size and pregnancy-induced hypertension (PIH).

STUDY DESIGN: We used data from the Collaborative Perinatal Project, a large prospective cohort study which collected detailed information on blood pressure, proteinuria, smoking, and placental morphology and histology, 9651 healthy primigravidas without chronic hypertension were included, who were enrolled into the study before 28 weeks of gestation (average 18 weeks) and had at least 3 prenatal visits. Gestational hypertension was defined as two or more diastolic blood pressure over 90 mmHg from 24 weeks of gestation to 2 weeks postpartum. Preeclampsia was defined as gestational hypertension plus at least two instances of proteinuria (1+ or more) at the same gestational period.

RESULTS: After controlling for pre-pregnancy body mass, age, socioeconomic status, race, smoking was associated with a reduced risk of PIH in a dose-effect pattern. The protective effect was observed for both mild and severe gestational hypertension and preeclampsia. Smoking during pregnancy slightly but significantly increased placental weight (1.5%) and area of placental surface (1.7%) but had no effect on placental thickness.

CONCLUSION: Smoking is associated with a reduced risk of PIH. The slight change in placental size observed is unlikely to be the underlying mechanism. The protective effect appears to continue even after one has stopped smoking. Alternative explanations are discussed.

<table>
<thead>
<tr>
<th>Smoking status (cig./day)</th>
<th>Gestational hypertension (OR, 95%CI)</th>
<th>Preeclampsia (OR, 95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Ex-smoker (max. amount smoked)</td>
<td>1.1 (0.9-1.3)</td>
<td>0.8 (0.6-1.2)</td>
</tr>
<tr>
<td>1-5</td>
<td>0.8 (0.6-1.1)</td>
<td>0.7 (0.4-1.3)</td>
</tr>
<tr>
<td>6-10</td>
<td>0.7 (0.4-0.98)</td>
<td>1.1 (0.7-1.8)</td>
</tr>
<tr>
<td>11-20</td>
<td>0.6 (0.3-1.2)</td>
<td>1.1 (0.8-1.5)</td>
</tr>
<tr>
<td>20+</td>
<td>0.6 (0.4-0.9)</td>
<td>0.8 (0.6-1.2)</td>
</tr>
</tbody>
</table>

126 EFFECT OF ANTHYPERTENSIVE THERAPY ON THE DEVELOPMENT OF SUPERIMPOSED PREECLAMPSIA IN PATIENTS WITH CHRONIC HYPERTENSION: A META-ANALYSIS. L. Sanchez-Ramos, CS Mora,* Department of Obstetrics & Gynecology, University of Florida, Jacksonville, FL.

OBJECTIVE: To analyze published randomized trials assessing the efficacy of antihypertensive therapy in patients with chronic hypertension during pregnancy.

STUDY DESIGN: A search of entries in electronic data bases was conducted then supplemented with references cited in original studies and review articles to identify randomized trials of antihypertensive therapy in pregnancy. Two investigators reviewed the methodological attributes of each study for randomization criteria. An estimate of the odds ratio (OR) for efficacy of antihypertensive therapy in patients with chronic hypertension was calculated according to standard ultrasonic formula, and a 2nd degree log polynomial growth model was used to derive the fetal weight curve for each pregnancy. The gestational age was calculated at which the growth curve crossed below the tenth percentile. Thirty seven women developed preeclampsia with proteinuria and hypertension.

RESULTS: In the 37 pregnancies with PE, FGR (<10th customized birthweight percentile) occurred in 14 (38%) of cases. The mean gestational age at which preeclampsia became apparent was similar in pregnancies with FGR (238.4 days, SD 27.6) and without FGR (231.1 days, SD 29.5). In pregnancies with FGR at birth, the growth curve crossed below the 10th percentile line at an average gestational age of 222.8 days (SD 24.7), and in 11 of 14 cases (79%), before the clinical manifestations of PE. Within individual pregnancies, the growth curve fell below the 10th percentile line on average 11.8 days (SD 18.8) before preeclampsia was present.

CONCLUSIONS: Contrary to a popular view, preeclampsia does not cause growth restriction. In pregnancies complicated by both, FGR can be diagnosed well before PE. This is consistent with the concept that both complications are preceded by a common pathological condition relating to placentation in early pregnancy.

<table>
<thead>
<tr>
<th>Smoking status (cig./day)</th>
<th>Gestational hypertension (OR, 95%CI)</th>
<th>Preeclampsia (OR, 95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>1.0</td>
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</tr>
<tr>
<td>Ex-smoker (max. amount smoked)</td>
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</tr>
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<td>1-5</td>
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</tbody>
</table>

127 TEMPORAL RELATIONSHIP BETWEEN ONSET OF PREECLAMPSIA AND FETAL GROWTH RESTRICTION / Gordis, L. CLD de Jong§, PRAM, QMC-Univ. Hospital, Nottingham, UK

OBJECTIVE: We postulated that in pregnancies complicated by preeclampsia (PE) and fetal growth restriction (FGR), fetal growth slows before signs of preeclampsia become manifest.

STUDY DESIGN: Women considered at-risk of uteroplacental insufficiency were referred to a research clinic for regular (2-3 weekly) trimester ultrasound scans. Fetal weight was calculated according to standard ultrasonic formula, and a 2nd degree log polynomial growth model was used to derive the fetal weight curve for each pregnancy. The gestational age was calculated at which the growth curve crossed below the 10th percentile. Thirty seven women developed preeclampsia with proteinuria and hypertension.

RESULTS: In the 37 pregnancies with PE, FGR (<10th customized birthweight percentile) occurred in 14 (38%) of cases. The mean gestational age at which preeclampsia became apparent was similar in pregnancies with FGR (238.4 days, SD 27.6) and without FGR (231.1 days, SD 29.5). In pregnancies with FGR at birth, the growth curve crossed below the 10th percentile line at an average gestational age of 222.8 days (SD 24.7), and in 11 of 14 cases (79%), before the clinical manifestations of PE. Within individual pregnancies, the growth curve fell below the 10th percentile line on average 11.8 days (SD 18.8) before preeclampsia was present.

CONCLUSIONS: Contrary to a popular view, preeclampsia does not cause growth restriction. In pregnancies complicated by both, FGR can be diagnosed well before PE. This is consistent with the concept that both complications are preceded by a common pathological condition relating to placentation in early pregnancy.

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<td>11-20</td>
<td>0.6 (0.3-1.2)</td>
<td>1.1 (0.8-1.5)</td>
</tr>
<tr>
<td>20+</td>
<td>0.6 (0.4-0.9)</td>
<td>0.8 (0.6-1.2)</td>
</tr>
</tbody>
</table>

128 THE EFFECT OF SMOKING AND PREECLAMPSIA ON FETAL GROWTH J. Gardosi, L. Soulez. PRAM, QMC-University Hospital, Nottingham, UK

OBJECTIVE: Smoking causes fetal growth restriction (FGR) but is known to reduce the incidence of preeclampsia, while preeclampsia itself is associated with FGR. The purpose of this investigation was to study the interactive effect of these factors on fetal growth.

STUDY DESIGN: Prospective data on 17,495 consecutive deliveries of singleton pregnancies booked at a centre with a general maternal population over a 5.5 year period. Pregnancy induced hypertension (PIH) and preeclampsia (PE) were defined according to ACOG guidelines. Gestational age was calculated from scan dates, and fetal growth restriction (FGR) was defined as birthweight <10th percentile of optimum weight-for-gestational age after adjustments for maternal height, weight, ethnic group, parity and sex of baby.

RESULTS: The table shows the incidence of FGR in each category.

<table>
<thead>
<tr>
<th>Smoking status (cig./day)</th>
<th>Gestational hypertension (OR, 95%CI)</th>
<th>Preeclampsia (OR, 95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Ex-smoker (max. amount smoked)</td>
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<td>0.8 (0.6-1.2)</td>
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<tr>
<td>1-5</td>
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<td>0.7 (0.4-1.3)</td>
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<td>11-20</td>
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</tr>
<tr>
<td>20+</td>
<td>0.6 (0.4-0.9)</td>
<td>0.8 (0.6-1.2)</td>
</tr>
</tbody>
</table>

Multivariate analysis showed that FGR rate was increased by PIH (RR 1.3, CI 1.1-1.5) and by PE (RR 3.6, CI 2.8-4.7), but also independently by smoking (RR 2.3, CI 2.1-2.6). Smokers with PIH or PE had the highest risk of an FGR baby: RR 5.1, CI 3.1-8.5.

CONCLUSIONS: Smoking, PIH and PE affect fetal growth. The effect of smoking on FGR is independent and additive to that of the hypertensive diseases in pregnancy.
### 129 EARLY PREGNANCY RISK FACTORS FOR PREGNANCY INDUCED HYPERTENSION AND PREECLAMPSIA

**Objective:** Hypertensive diseases of pregnancy are associated with many adverse outcomes but are difficult to predict. Our aim was to quantify the risk factors known at the beginning of pregnancy.

**Study Design:** 17,495 consecutive deliveries of singleton pregnancies booked at a centre with an unselected population. Pregnancy induced hypertension (PIH) and preeclampsia (PE) were defined according to ACOG guidelines.

**Results:** The incidence of PIH was 1.3%, and PE 1.7% in this general population. The table lists adjusted risks for PIH and PE.

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>PIH RR</th>
<th>PIH CI</th>
<th>PE RR</th>
<th>PE CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal weight &lt;10th centile</td>
<td>1.9</td>
<td>1.3 - 2.7</td>
<td>3.4</td>
<td>2.6 - 4.5</td>
</tr>
<tr>
<td>Maternal age &lt;20</td>
<td>3.0</td>
<td>2.2 - 4.0</td>
<td>2.7</td>
<td>2.1 - 3.5</td>
</tr>
<tr>
<td>Past history of preterm birth</td>
<td>n.s.</td>
<td></td>
<td>2.3</td>
<td>1.2 - 4.4</td>
</tr>
<tr>
<td>Maternal height &lt;10th centile</td>
<td>n.s.</td>
<td></td>
<td>1.7</td>
<td>1.1 - 2.7</td>
</tr>
<tr>
<td>Smoking</td>
<td>0.4</td>
<td>0.2 - 0.6</td>
<td>0.6</td>
<td>0.4 - 0.8</td>
</tr>
<tr>
<td>Maternal age &lt;20</td>
<td>0.4</td>
<td>0.2 - 0.9</td>
<td>n.s.</td>
<td></td>
</tr>
<tr>
<td>Maternal weight &lt;10th centile</td>
<td>n.s.</td>
<td></td>
<td>0.5</td>
<td>0.3 - 0.8</td>
</tr>
</tbody>
</table>

**Conclusions:** High maternal weight in early pregnancy is a strong risk factor for subsequent development of PE as well as PIH. Smoking appears to be protective, independently of other variables such as maternal weight, height, and age.

### 130 PREECLAMPSIA AND FETAL GROWTH RESTRICTION: INDEPENDENT ASSOCIATIONS WITH SPONTANEOUS PRETERM BIRTH

**Objective:** Recent work has shown an association between spontaneous preterm labor and preceding fetal growth restriction. It is uncertain as to what degree this effect is related to preeclampsia.

**Study Design:** Prospective data on 17,495 consecutive deliveries of singleton pregnancies booked at a centre with a general population over a 5.5 year period. Pregnancy induced hypertension (PIH) and preeclampsia (PE) were defined along the AGOG guidelines.

**Results:** The number of babies with fetal growth restriction increased sharply with the severity of the condition. Preeclampsia increased the risk of early preterm birth (<34 weeks) which included 2.1% early preterm births (<34 weeks). The incidence of PIH was 1.27%, mild PE 1.56% and severe PE 0.35% in this unselected population. The table lists the rate of spontaneous and iatrogenic preterm delivery in each group.

<table>
<thead>
<tr>
<th>Birthweight Cenile</th>
<th>spont. onset (%)</th>
<th>&lt;34 weeks</th>
<th>spont. onset (%)</th>
<th>&lt;37 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;10th centile</td>
<td>1.8</td>
<td>85.5</td>
<td>6.9</td>
<td>75.9</td>
</tr>
<tr>
<td>n.s.</td>
<td>2.7</td>
<td>50.0</td>
<td>12.6</td>
<td>35.7</td>
</tr>
<tr>
<td>n.s.</td>
<td>9.2</td>
<td>54.5</td>
<td>24.4</td>
<td>29.3</td>
</tr>
<tr>
<td>n.s.</td>
<td>40.3</td>
<td>88.0</td>
<td>64.5</td>
<td>65.0</td>
</tr>
</tbody>
</table>

The proportion of preterm deliveries increased sharply with the severity of the condition. Preeclampsia increased the risk of early preterm birth (<34 weeks) by a ratio of 10.0 (CI 7.2 - 15.9), and of prematurity (<37 weeks) by a ratio of 6.5 (CI 5.1-8.4). In most cases of PE, preterm birth followed spontaneous labor.

**Conclusions:** The association between hypertensive diseases of pregnancy and prematurity is related to the severity of the disease. Most preterm birth in severe preeclampsia follows spontaneous labor.
133 MATERNAL AND NEONATAL OUTCOMES WITH DELIVERY FOR SEVERE PREECLAMPSIA AT <25 WEEKS GESTATION. S Jenkins*, B Hogg, JC Hauth, Dept. of OB/GYN, University of Alabama at Birmingham, Birmingham, AL.

OBJECTIVE: To determine perinatal outcomes with delivery for severe pre-eclampsia (PE) prior to 25 weeks gestation.

STUDY DESIGN: A computerized database identified 5800 women with PE from 35,937 deliveries from 1991-1997 at our institution. Of these, 16 women (1.5%) who delivered <25 weeks gestation were abstracted perinatal outcomes in these women.

RESULTS: Delivery indications included severe-range blood pressures (33), HELLP syndrome (3), oligohydramnios/fetal growth restriction (1) and fetal demise (2). Mortality in 21 women included abruptio (5), HELLP syndrome (9), oliguria (6), renal insufficiency (5) and eclampsia (5). No patients required dialysis, ICU admission or died. Twenty-two infants (55%) were liveborn and 3 (10%) survived. The 4 survivors each had severe short and long-term disabilities.

CONCLUSION: Women with severe PE prior to 25 weeks gestation had appreciable maternal morbidity even with a protocol of immediate delivery. However, these morbidities were less severe than those reported with conservative management (observational) protocols. Neonatal mortality was 90% and all survivors had severe morbidities. We therefore continue to recommend immediate delivery for women with sustained severe PE prior to 25 weeks gestation because of the threat of severe maternal morbidity and the lack of improved perinatal outcomes from reported observational protocols.

134 ECLAMPSIA RISK FACTORS FOR MATERNAL MORTALITY AND MORBIDITY. F M Mattar*, I Usta, B M Sibai. Dept. of OB/GYN. University of Tennessee, Memphis, TN.

OBJECTIVE: To identify risk factors leading to adverse maternal outcome in pregnancies complicated by eclampsia.

STUDY DESIGN: A descriptive study of 399 consecutive women with eclampsia managed at 1 perinatal center between August 1977 and July 1998. Data were collected prospectively by detailed review of medical records. Risk factors studied included maternal age, race, parity, preceding medical complications, clinical and laboratory findings. Outcome variables were maternal mortality and morbidity. Data were analyzed using the Chi2 analysis or the unpaired student’s t-test as appropriate.

RESULTS: In the entire cohort of eclamptic women, major maternal complications included abruptio placenta (10%), HELLP syndrome (11%), DIC (6%), neurologic deficits and aspiration pneumonia (6%), pulmonary edema (5%), cardiopulmonary arrest (4%), acute renal failure (3%), and death (1%, 2 patients with antepartum onset). Women with antepartum eclampsia had a significantly higher incidence of abruptio placenta and HELLP syndrome (Table). Further analysis by gestational age revealed that abruptio placenta and HELLP syndrome were significantly more frequent when eclampsia developed <32 weeks (Table). Age at onset revealed that abruptio placentae and HELLP syndrome (Table). Further analysis by gestational age revealed that abruptio placentae and HELLP syndrome were significantly more frequent when eclampsia developed <32 weeks (Table).

CONCLUSION: Eclampsia remains a significant complication of pregnancy with high maternal mortality and morbidity. Antepartum onset as well as onset at ≤32 weeks’ gestation is particularly dangerous to both mother and fetus.

135 ADVERSE MATERNAL AND PERINATAL OUTCOMES IN A COHORT OF HEALTHY NULLIPAROUS WOMEN WHO SUBSEQUENTLY DEVELOPED HYPERTENSION/PREECLAMPSIA. JC Hauth for the CEP Study Group, NICHD, Bethesda, MD.

OBJECTIVE: To determine adverse maternal and/or perinatal outcome in nulliparous women with pregnancy associated hypertension (PAH) n preeclampsia (PE).

STUDY DESIGN: We conducted a randomized double-blind, placebo controlled trial in 4,589 healthy nulliparas assigned for gestation to receive either 2 g of elemental calcium or placebo daily. The well defined and characterized dataset provides an opportunity to more precisely detail adverse maternal, fetal and newborn outcomes in a prospectively ascertained series of healthy nulliparas.

RESULTS: Of 4,302 women followed to ≥20 weeks’ gestation, 10% (24.9%) developed mild PAH/PE (952; 21.7%) or severe PAH/PE (46; 3.3%). One hundred-sixteen women (10.8%) with a hypertensive diagnosis and 336 (10.4%) without a hypertensive endpoint were delivered at ≥32 weeks gestation. Fetal and neonatal mortality was similar in these groups; however, selected maternal and newborn morbidities were significantly increased in women with a hypertensive diagnosis. Adverse outcomes were highest in the women with severe PAH or PE as compared to the 3,290 women with mild hypertension.

CONCLUSION: In 4,302 healthy nulliparas, a hypertensive endpoint especially a severe endpoint, was associated with an appreciable increase in clinically important adverse maternal and perinatal morbidity but not perinatal mortality.
OBJECTIVE: Elevated levels of anticardiolipin antibodies (aCL) have been reported in women with preeclampsia prompting some investigators to recommend testing these women. Recently, it has become apparent that the plasma protein, β2glycoprotein I (β2GP-I), may be the true epitope for aCL binding. Indeed, antibodies against β2GP-I may be more specific than aCL for the clinical features of antiphospholipid syndrome. However, the relationship between anti-β2GP-I and preeclampsia has not been systematically investigated. Our purpose was to determine whether anti-β2GP-I are associated with preeclampsia.

METHODS: Plasma from four groups of women were obtained at the time of admission to labor and delivery: 1) mild preeclampsia (N = 76); 2) severe preeclampsia (N = 94); 3) HELLP syndrome (N = 41); and 4) normotensive controls (N = 99). Plasma levels of aCL and anti-β2GP-I were determined by ELISA and compared using ANOVA and contingency tables. RESULTS: Numbers and percentages of positive results for each group:

<table>
<thead>
<tr>
<th>Group</th>
<th>aCL</th>
<th>β2GP-I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild preeclampsia</td>
<td>2/94</td>
<td>1/41</td>
</tr>
<tr>
<td>Severe preeclampsia</td>
<td>2/94</td>
<td>1/41</td>
</tr>
<tr>
<td>HELLP syndrome</td>
<td>2/94</td>
<td>1/41</td>
</tr>
<tr>
<td>Normotensive controls</td>
<td>0/76</td>
<td>0/99</td>
</tr>
</tbody>
</table>

CONCLUSION: Circulating levels of anti-β2GP-I and aCL were not increased in patients with preeclampsia or HELLP syndrome. Our data do not support routine testing for anti-β2GP-I or aCL in women with preeclampsia.
141 FATTY ACID BINDING PROTEIN 2 IS NOT ASSOCIATED WITH PREECLAMPSIA. 

**Problem:** Preeclampsia (PE) is a pregnancy complication characterized by hypertension and proteinuria. The underlying mechanisms remain unclear, but there is evidence suggesting a role for lipid metabolism. Fatty Acid Binding Protein 2 (FABP2) is involved in the transport of long-chain fatty acids and is expressed in the placenta.

**Objective:** To investigate the association between FABP2 polymorphisms and the risk of pre-eclampsia.

**Methods:** A case-control study was conducted in pregnant women with and without preeclampsia. DNA was extracted from peripheral blood leukocytes and genotyped for the FABP2 polymorphisms associated with altered FABP2 expression.

**Results:** No significant association was found between the FABP2 polymorphisms and the risk of pre-eclampsia. The frequencies of the FABP2 genotypes were similar in pregnant women with and without pre-eclampsia.

**Conclusion:** The current study does not support a role for FABP2 polymorphisms in the development of pre-eclampsia.

142 LACK OF ADHESION MOLECULE LFA-3 UPRREGULATION IN PREECLAMPSIA PREDICTS THE NEED FOR EARLY DELIVERY. 

**Problem:** Pre-eclampsia is a pregnancy complication characterized by hypertension and proteinuria. The mechanism of early delivery in pre-eclampsia is not well understood. Lymphocyte function associated antigen-3 (LFA-3) is an adhesion molecule involved in immune cell trafficking.

**Objective:** To determine whether high LFA-3 serum levels predict the need for early delivery in pre-eclampsia.

**Methods:** Serum levels of LFA-3 were measured in pregnant women with and without pre-eclampsia. The study population included 1324 pregnant women, of whom 552 had pre-eclampsia.

**Results:** Pregnant women with pre-eclampsia had significantly higher serum LFA-3 levels compared to normotensive pregnant women. The mean difference in LFA-3 levels was 50%.

**Conclusion:** High serum levels of LFA-3 predict the need for early delivery in pre-eclampsia.

143 CEREBROVASCULAR REACTIVITY IN NORMOTENSIVE AND HYPERTENSIVE PREGNANCY: A TRANSCRANIAL DOPPLER STUDY. 

**Problem:** Cerebrovascular reactivity is important for cerebral perfusion during pregnancy. In hypertensive pregnancies, cerebral autoregulation may be impaired, leading to hypertensive crises.

**Objective:** To evaluate cerebral vascular reactivity using transcranial Doppler ultrasound in normotensive and hypertensive pregnancies.

**Methods:** Transcranial Doppler ultrasound was performed in 25 normotensive and 25 hypertensive pregnant women. Cerebral artery blood flow velocity was measured during changes in arterial and venous pressure.

**Results:** In hypertensive pregnancies, there was a significant decrease in cerebral artery blood flow velocity during increases in arterial pressure, indicating impaired cerebral autoregulation.

**Conclusion:** Cerebrovascular reactivity is impaired in hypertensive pregnancies, potentially contributing to the development of hypertensive crises.

144 MATERNAL SERUM LEPTIN LEVELS IN PREECLAMPSIA, NONPROTEINURIC GESTATIONAL HYPERTENSION AND NORMOTENSIVE PREGNANCY. 

**Problem:** Leptin is a hormone involved in energy balance and metabolic regulation. Its role in pregnancy complications such as preeclampsia and gestational hypertension is not fully understood.

**Objective:** To compare maternal serum leptin levels in normotensive, nonproteinuric preeclampsia, and gestational hypertension pregnancies.

**Methods:** Maternal serum leptin levels were measured using radioimmunoassay in 60 normotensive (n=20), preeclampsia (n=20), and gestational hypertension (n=20) pregnancies.

**Results:** Leptin levels were significantly higher in preeclampsia compared to normotensive pregnancy, with intermediate levels in gestational hypertension.

**Conclusion:** Leptin levels are elevated in preeclampsia and gestational hypertension, possibly reflecting maternal metabolic changes associated with these conditions.


**Objective:** To evaluate the use of maternal serum calcium and magnesium levels for predicting maternal and neonatal outcomes in pregnancies complicated by hypertension.

**Methods:** Maternal serum calcium and magnesium levels were measured in 100 women with hypertension during pregnancy. Neonatal outcomes were compared between normal and hypertensive pregnancies.

**Results:** There were no significant differences in maternal serum calcium and magnesium levels between normal and hypertensive pregnancies. However, neonatal outcomes were significantly worse in hypertensive pregnancies.

**Conclusion:** Maternal serum calcium and magnesium levels do not reliably predict outcomes in pregnancies complicated by hypertension.
Determination of Nitric Oxide Metabolites in Pre-eclamptic and Normal Pregnancies by Gradient Ion Chromatography. A Papageorghiou, V. Farlie, J. Monaghan, D. Cowherd, J.J. Walker. The Jessop Hospital for Women, Sheffield, Dept Chemistry, Hallam University, Sheffield, St. James's Hospital, Leeds U.K.

**OBJECTIVES:** The vasoconstriction and impaired platelet function characteristic of pre-eclampsia (PE) may be due to abnormal production of nitric oxide (NO). Maternal serum NO metabolites have been reported as increased, decreased or unchanged in PE. These conflicting results may be due to methodological difficulties. In this study, gradient ion chromatography, a new, simple, reliable and inexpensive technique has been used to determine serum nitrate and nitrite levels (the stable metabolites of NO) in normal and pre-eclamptic pregnancies. PE has been defined as a diastolic blood pressure of ≥20 mmHg with previously lower readings and proteinuria of ≥2+ on dipstick or ≥0.3 gm in 24 hours. The test was used for statistical analysis.

STUDY DESIGN: Maternal serum was obtained from 21 women with normal pregnancies (controls) and 21 women with PE. Cord vein samples were obtained from 9 of the PE pregnancies. Maternal PE samples were collected within 48 hours prior to delivery. Nitrate and nitrite levels were determined by gradient ion chromatography with direct UV detection using centrifugal ultrafiltration as the only pretreatment. Mann-Whitney U test was used for statistical analysis.

**RESULTS:** There were no differences between control and PE maternal samples or between PE maternal and cord vein samples.


**OBJECTIVE:** To determine if a 12-hour urine collection can be used to reliably and accurately assess proteinuria in hypertensive gravidas hospitalized to determine if preeclampsia is present.

**STUDY DESIGN:** Thirty patients who were admitted to the University of Mississippi Medical Center between January 1998 and June 1998 for evaluation of preeclampsia underwent two consecutive 12-hour urine collections. Each timed collection was analyzed for total protein, total calcium, total volume, and urine creatinine. A concurrent serum creatinine and creatinine clearance were calculated from the assayed values. A Pearson's correlation coefficient of ≥0.70 was used to indicate statistically significant correlation.

**RESULTS:** Seven percent of patients had mild preeclampsia, 47% had severe preeclampsia, 10% had chronic hypertension with superimposed preeclampsia, and 7% had hypertension that did not meet the criteria for either preeclampsia or chronic hypertension. Total protein, protein:creatinine ratio, calcium:creatinine ratio, and creatinine clearance were significantly correlated between the two consecutive 12-hour urine specimens (Pearson's R ≥0.70, p < 0.05). In contrast, the assessment of total calcium, calcium:creatinine ratio, creatinine clearance, total volume, and urine creatinine were inconsistent between collections.

**CONCLUSIONS:** A 12-hour urine collection appears sufficient to quickly and accurately assess the severity of proteinuria in patients hospitalized for evaluation of preeclampsia. A longer interval is required to accurately assess calcium loss. A shorter time interval for the accurate assessment for proteinuria in the population could shorten hospitalization, minimize unnecessary intervention, better direct therapy, and reduce healthcare costs.

147 EXPRESSION OF PLACENTAL CYTOKINES TNF-α, IL-1β, AND IL-6 ARE INCREASED IN PREECLAMPSIC PATIENTS. B.K. Rinehart, D.A. Terrone, S. Lagoo-Deenadayalan, W.H. Barber, E. Hale, J.N. Martin Jr, W.A. Bennett. Department of Ob/Gyn, University of Mississippi Medical Center, Jackson, MS.

**OBJECTIVE:** The purpose of this investigation was to compare the expression of cytokines by the placentas from preeclampsic and normal pregnancies.

**STUDY DESIGN:** Whole fresh placentas were collected from 4 patients with severe preeclampsia (PE) who underwent cesarean section without cervical ripening and prior to labor. Placentas were also collected from 4 normotensive (NT), uncomplicated gravidas at the time of elective cesarean delivery prior to the onset of labor. Total RNA was extracted from each placenta and cytokine expression was analyzed by a Reverse transcription-polymerase chain reaction (RT-PCR) technique. All tissues were assayed for β-actin, TNF-α, IL-1β, IL-1β, IL-2, IL-6, and IL-10 mRNA.

**RESULTS:** The PE group was significantly different from the NT group for gestational age at delivery (p<0.01) and maximum systolic blood pressure (p<0.04). No other clinical criteria were significantly different (p>0.05). The expression of IL-1β, IL-6, and TNF-α was higher in 2 of 4 PE placentas when compared to NT.

**CONCLUSIONS:** The placentas of some pregnancies with severe preeclampsia express higher levels of IL-8, IL-6, and TNF-α and mRNA compared to normotensive pregnancies. Standard clinical (blood pressure) and laboratory (urine protein, uric acid) parameters did not permit characterization of the preeclampsic pregnancies with or without enhanced placental cytokine production in this pilot investigation.


**OBJECTIVE:** Our purpose was to investigate the total peroxyl radical-trapping antioxidant parameter (TRAP) of amniofluid in normal pregnancy and preeclampsia.

**STUDY DESIGN:** The TRAP of amniofluid was analyzed 36 women with normal pregnancies and 12 women with preeclampsia. The TRAP value of amniofluid was measured by Wayner's method, although some reaction conditions were modified. The ultrafiltration fraction and high performance liquid chromatography (HPLC) have performed to determine the contributory factor to the TRAP of amniofluid.

**RESULTS:** The TRAP was found to increase progressively with advancing normal pregnancy during 16-40 weeks gestational age (r=36, r=0.95). In preeclampsia, a significant increase in TRAP was noted in amniofluid from gestational age-matched normal pregnancies (p<0.01). The results of ultrafiltration fraction and HPLC suggested that uric acid was the most important contributory factor determining the changes in the TRAP of amniofluid. TRAP value of amniofluid from women with normal pregnancy and preeclampsia showed closely correlated (r=20, r=0.99) with uric acid concentration in the fluid.

**CONCLUSIONS:** With advancing normal pregnancy, TRAP increases in amniofluid. The increased TRAP of amniofluid in preeclampsia may be interpreted as a result of increased oxidative stress. Uric acid may contribute to almost all of the TRAP value of amniofluid in normal pregnancy and preeclampsia.
150 THE EFFECT OF PLASMA VOLUME EXPANSION IN PREECLAMPSIA.

AC Bolte1, J van Eyck2, RJM Strack van Schijndel3, HP van Geijn4, GA Dekker1. Deps. of Ob/Gyn and Intensive Care Med.3, Free Univ Hospital Amsterdam, Deps. of Ob/Gyn, Sophia Hospital Zwolle5, The Netherlands.

OBJECTIVE: To study the effects of plasma volume expansion (PVE) on hemodynamic measurements in early-onset preeclamptic patients.

STUDY DESIGN: In a prospective study PVE was administered until a pulmonary capillary wedge pressure (PCWP) of 8-12 mmHg was reached. Included were nulliparous, genuine preeclamptic patients with a diastolic blood pressure > 100 mmHg and 26-32 weeks gestation. Pulmonary artery catheter derived hemodynamic measurements, intraarterial blood pressure and heart rate were recorded. 15 patients were untreated and 4 received magnesium sulfate at inclusion. Results are in mean ± SD.

RESULTS: Measurements at baseline and after PVE are shown in the Table. Baseline PCWP was 6.2 ± 3.0 mmHg and the amount of fluid administered was 1481 ± 1172 ml. Significant changes (p<0.05) after PVE were noted in stroke volume and left ventricular stroke work index. The increase in cardiac output and decrease in systemic vascular resistance did not reach significance (p>0.1). Between the untreated patients and the 4 patients with magnesium sulfate at inclusion. Results are in mean ± SD.

CONCLUSIONS: An increase in stroke volume and in left ventricular stroke work index were the significant changes found in strictly defined preeclamptic patients after PVE. No effect on blood pressure was noted.

n = 19 *p<0.05

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Baseline</th>
<th>After PVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systolic blood pressure mmHg</td>
<td>175 ± 20</td>
<td>177 ± 17</td>
</tr>
<tr>
<td>Diastolic blood pressure mmHg</td>
<td>105 ± 12</td>
<td>104 ± 8</td>
</tr>
<tr>
<td>Mean arterial pressure mmHg</td>
<td>131 ± 15</td>
<td>132 ± 15</td>
</tr>
<tr>
<td>Heart rate beat/min</td>
<td>85 ± 13</td>
<td>89 ± 19</td>
</tr>
<tr>
<td>Cardiac output l/min</td>
<td>6.3 ± 1.4</td>
<td>7.0 ± 1.5</td>
</tr>
<tr>
<td>Stroke volume ml/beat</td>
<td>76 ± 20</td>
<td>86 ± 20*</td>
</tr>
<tr>
<td>Systemic vascular resistance</td>
<td>1629 ± 310</td>
<td>1642 ± 337</td>
</tr>
</tbody>
</table>


OBJECTIVES: Vascular tone is controlled largely by the sympathetic nervous system and is modulated by neuropeptide Y. Preeclampsia is linked to sympathetic overactivity [Schochel, NEJM 1996;335:1482]. Nitric oxide can vaso-relax vessels or decrease sympathetic outflow by activating the baroreceptor reflex [Scrogin, Hyper tension 1994;25:2982]. Our purpose was to compare serum levels of neuropeptide Y and nitrite levels in normotensive and preeclamptic gravidas.

STUDY DESIGN: Twelve preeclamptic and twelve normotensive women matched for race, body mass index, parity, and gestational age were studied. Neuropeptide Y was measured using a commercial radioimmunoassay. Nitric oxide was converted to nitrite using metallic cadmium and nitrite levels were determined spectrophotometrically using a calorimetric assay. Data are presented as mean ± SEM and were compared using a t-test.

RESULTS:

<table>
<thead>
<tr>
<th>Level</th>
<th>Normotensive (n=12)</th>
<th>Preeclampsia (n=12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neuropeptide Y (pg/mL)</td>
<td>32.2 ± 3.5</td>
<td>33.8 ± 3.0</td>
</tr>
<tr>
<td>Nitrite (µM/mL)</td>
<td>11.2 ± 0.4</td>
<td>11.6 ± 0.8</td>
</tr>
</tbody>
</table>

There were no significant differences in neuropeptide Y levels or nitrite levels between the two groups. We also examined the ratios of neuropeptide Y and nitrite and found no correlation between normotensive and preeclamptic women.

CONCLUSION: Peripheral measurement of neuropeptide Y or nitrite does not correlate with preeclampsia. Assessment of sympathetic overactivity in preeclampsia requires an alternate model.
152 PROTHROMBIN 20210 AG MUTATION AND FACTOR V LEIDEN MUTATION IN PATIENTS WITH A HISTORY OF SEVERE PREECLAMPSIA AND/OR HELLP SYNDROME. MG van Pampus, H Wolf, MMW Koopman, A van den Ende, PH Reitsma. Academic Medical Center, Amsterdam, The Netherlands.

OBJECTIVE: Are 20210 G to A prothrombin gene variant (PGV) and factor V Leiden (FVL) mutation not only associated with thrombotic risk but also with preeclampsia, HELLP syndrome or adverse perinatal outcome?

STUDY DESIGN: 114 women with a history of severe preeclampsia (diastolic blood pressure ≥ 110 mmHg and proteinuria ≥0.5 g/24 hrs) or (H)ELLP syndrome before 34 weeks were examined post partum for the presence of these mutations.

RESULTS: 4 women (4%) had PGV, 2 (2%) FVL and one woman had both. This is comparable with the prevalence in healthy controls (2.5%). The table shows women with and without mutation.

<table>
<thead>
<tr>
<th>No mutation</th>
<th>Mutation</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>107 (94%)</td>
<td>7 (6%)</td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33 (21-47)</td>
<td>33 (29-46)</td>
<td></td>
</tr>
<tr>
<td>Smoking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>42 (39%)</td>
<td>4 (57%)</td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 (12%)</td>
<td>9 (14%)</td>
<td>1.2 (0.0-12)</td>
</tr>
<tr>
<td>Thromboembolism in family</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17 (16%)</td>
<td>0 (—)</td>
<td></td>
</tr>
<tr>
<td>Thromboembolism in patient</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 (2%)</td>
<td>2 (29%)</td>
<td>22(1.7-303)</td>
</tr>
<tr>
<td>Gestational age (weeks)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32.0 (23-41)</td>
<td>31.3 (27-35)</td>
<td></td>
</tr>
<tr>
<td>Birth weight (grams)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1265 (400-2420)</td>
<td>1510 (400-2420)</td>
<td></td>
</tr>
<tr>
<td>Perinatal mortality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26 (22%)</td>
<td>2 (29%)</td>
<td>1.5 (0.2-9.5)</td>
</tr>
</tbody>
</table>

CONCLUSIONS: Women with a history of preeclampsia and/or (H)ELLP syndrome have a normal prevalence of PGV and FVL. When a mutation is present, perinatal mortality is not increased. However, these women have an increased risk for thromboembolism.

155 CARDIOPULMONARY MORBIDITY AS A COMPLICATION OF SEVERE PREECLAMPSIA HELLP SYNDROME. D.A. Terrone, C.M. Isler, W.L. May, E.F. Magann, P.F. Norman, J.N. Martin, Jr. Department of Obstetrics & Gynecology, University of Mississippi Medical Center, Jackson, MS.

OBJECTIVE: To profile the types and frequencies of cardiopulmonary morbidity encountered in patients with severe preeclampsia with or without HELLP syndrome.

STUDY DESIGN: Retrospective single tertiary care center patient database (1997-2019) of 970 patients with severe preeclampsia (n=198) without HELLP syndrome (SPE) and 777 with HELLP as hemolysis/hepatic dysfunction (LDH≥200 IU/L; AST≥50 IU/L and/or ALT ≥ 240 IU/L) and thrombocytopenia (platelet count <100,000/uL in HELLP) and analyzed for morbidity and mortality.

RESULTS: Types of cardiopulmonary morbidity were analyzed for correlation with clinical/laboratory findings.

<table>
<thead>
<tr>
<th>Description</th>
<th>class-1</th>
<th>class-2</th>
<th>class-3</th>
<th>SPE</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congestive heart failure</td>
<td>7</td>
<td>4</td>
<td>8</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>Pulmonary edema/effusion</td>
<td>11</td>
<td>5</td>
<td>10</td>
<td>73</td>
<td></td>
</tr>
<tr>
<td>Acute lung injury/ARDS</td>
<td>12</td>
<td>3</td>
<td>4</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>CPAP/mechanical ventilation</td>
<td>14</td>
<td>7</td>
<td>4</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>Cardiopulmonary arrest</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Percent (%):</td>
<td>13 (3.5%)</td>
<td>8.5 (8.5%)</td>
<td>6.2 (7.6%)</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

As a group, patients with cardiopulmonary complications are more likely to have undergone cesarean delivery (11% vs 6%, p=0.019) at earlier gestations (35±6.760 vs 37±6.740 weeks, p=0.019), have higher peak postpartum systolic and diastolic blood pressures (<0.001), and exhibit significantly greater abnormalities in laboratory values (platelets, LDH, AST, CPK, BUN, Urine acid, p<0.05) than patients without this complication. Finally, patients with cardiopulmonary complications required almost twice as long to achieve diuresis as comparison patients (22±23 hrs vs 12±11, p<0.001).

CONCLUSIONS: The probability of cardiopulmonary complications increases significantly when the platelet count decreases <50,000/uL. Compared to all other groups of patients with SPE with without HELLP syndrome, patients with class 1 HELLP syndrome have a 13% versus 6.2% incidence of cardiopulmonary problems (p<0.001) and are 2.2 times more likely to develop these complications, resulting in hospitalization. Of all cardiopulmonary complications, acute lung injury/ARDS is most specific to class 1 HELLP syndrome. Transient renal dysfunction is probably closely related to cardiopulmonary complications with HELLP syndrome.


OBJECTIVE: To determine if there is a diurnal pattern in the clinical features of the HELLP-syndrome.

STUDY DESIGN: A retrospective study was performed in 134 pregnancies that were complicated by the HELLP-syndrome. Two observers (SK/JD) independently reviewed the medical records to describe each HELLP-fit. Time of day was divided in three categories: day (7:50 am-4 pm), evening (4 pm-11:30 pm), and night (11:30 pm-7:30 am). The following HELLP-fit parameters were categorized according to time of day: onset of symptoms, time of consultation by the doctor, initial blood analysis, time of diagnosis (= fulfilling all HELLP criteria), maximum of symptoms, recovery of symptoms. If there was discrepancy between the two observers a third observer (AH) decided on the final classification. To analyze frequency distribution of fit parameters in time $z^2$ test was used. A $p<0.05$ was considered significant.

RESULTS: To 82 women one or more HELLP-fits were well documented, leading to a total of 113 fits. For time of onset of symptoms, time of consultation by the doctor, and time of maximum symptoms higher frequencies were found during the evening and night, whereas for time of diagnosis and time of onset of symptoms these frequencies were higher during the day. In all parameters statistical significance was reached ($p<0.001$) except for the time of initial blood sampling during the fit.

CONCLUSIONS: A diurnal pattern seems to exist of the clinical features of the HELLP-syndrome which is characterized by an exacerbation of symptoms the night and recovery during the following day. These findings need to be verified in a prospective study.
157 MATERNAL MORTALITY ASSOCIATED WITH HELLP SYNDROME. C.M. Iker, B.K. Rinchart, D.A. Terrone, R.W. Martin, F.F. Magaan, J.N. Martin, Jr., Dept. Ob/Gyn, University of Mississippi Medical Center, Jackson, MS.

OBJECTIVE: To discern contributing factor(s) and complications contributing to the death of 51 women with HELLP syndrome.

STUDY DESIGN: Information from multiple sources including the obstetric literature, SMFM membership survey, known medical records, and a 16.5 year single institution tertiary care patient experience was combined and scrutinized to profile all known maternal mortalities associated with HELLP syndrome.

RESULTS: Information in some extent was available regarding 51 maternal deaths. The mean maternal age was 27.4±6.3 years. Race for 34 cases was 50% Caucasian, 38% African American, and 12% Hispanic. Gravidity for 49 cases revealed that 59% were multigravid and 41% were primigravid. There were 51% of patients with no prior pregnancies beyond 20 weeks EGA. Five patients (11%) in the series were known chronic hypertensives, and only one patient had experienced prior preclampsia.

The mean gestational age was 33.9±5.1 weeks. Presenting complaints in 46 patients included epigastric pain/nausea/vomiting (69%) and headache/CNS disturbance (19%). By HELLP syndrome classification 59% of patients had Class 1 disease, 36% had Class 2, and 5% had Class 3. Eclampsia was present in 43% of patients. Route of delivery (n=47) was abdominal in 72%, vaginal in 15%, and was not accomplished in 13% prior to maternal death. Perinatal outcome (n=40) was successful in 75%, but abdominal in 72%, vaginal in 15%, and was not accomplished in 13% prior to maternal death. Perinatal outcome (n=40) was successful in 75%, but abdominal in 72%, vaginal in 15%, and was not accomplished in 13% prior to maternal death.

RESULTS: One hundred fifty seven patients, 9.2% had an abnormal outcome of pregnancy. Multivariate regression showed that Inulin AUC (p < 0.05), BMI (F 6.0, p < 0.05) and RI (F 4.1, p < 0.05) were related to the abnormal outcome. Positive predictive value for BMI was 52%. In Insulinemic AUC > 54, for Doppler RI > 58; Doppler RIE Insuliniemia > Abnormal BMI patients had a RR 1.85 (CI 1.58-2.54); patients with an increased insuliniemia AUC had RR 2.03 (CI 1.49-2.70); abnormal Doppler patients had a RR 2.86 (CI 2.55-3.15) for an abnormal outcome; win Insuliniemia & RI were combined RR 3.82 (CI 3.30-4.60). The three combined pathological conditions showed an RR 3.51 (CI 2.53-4.70). Normol glycemic patients with normal Utine Doppler RI (435 patients) had a five fold increase in RR of abnormal outcome when hyperinsuliniemia was present (from 0.44 CI 0.14-0.70 to 2.25 CI 1.71-2.82).

CONCLUSIONS: Abnormal uterine Doppler, obesity and hyperinsuliniemia increase the risk of abnormal outcome of pregnancy. Hyperinsuliniemia is associated to an increased risk in subjects with normal uterine Doppler.

158 CAN MATERNAL MIDDLE CEREBRAL VELOCITY CHANGES PREDICT PREECLAMPSIA: A PRELIMINARY ANALYSIS. Jean-Marie Moutquin, DICT.

STUDY DESIGN: A cohort of 395 primiparous women were included at term. Maternal cerebral blood flow velocity (CBFV) shows a significant rise with maternal positional changes in preeclampsia but not in normotensive women. Our objective therefore was to assess whether the changes that occur with position, occur in patients in the 2nd and 3rd trimester prior to the development of preeclampsia.

STUDY DESIGN: A cohort of 396 women with a mean age of 25.1 years, there was no. Obstetrical clinic patients had determination of serum insulin and glucose after a 50 gram glucose challenge at the time of their first prenatal visit. The insulin-glucose ratio was compared to specific perinatal outcomes including the development of preeclampsia. Continuous variables were modeled using multiple linear regression, the Student's t test was used for comparison of means.

RESULTS: In 386 women with a mean age of 25.1 years, there was no. Obstetrical clinic patients had determination of serum insulin and glucose after a 50 gram glucose challenge at the time of their first prenatal visit. The insulin-glucose ratio was compared to specific perinatal outcomes including the development of preeclampsia. Continuous variables were modeled using multiple linear regression, the Student's t test was used for comparison of means.

RESULTS: Of the 49 patients, 50% Caucasian, 38% African American, and 12% Hispanic. Gravidity for 49 cases revealed that 59% were multigravid and 41% were primigravid. There were 51% of patients with no prior pregnancies beyond 20 weeks EGA. Five patients (11%) in the series were known chronic hypertensives, and only one patient had experienced prior preclampsia. The mean gestational age was 33.9±5.1 weeks. Presenting complaints in 46 patients included epigastric pain/nausea/vomiting (69%) and headache/CNS disturbance (19%). By HELLP syndrome classification 59% of patients had Class 1 disease, 36% had Class 2, and 5% had Class 3.

Eclampsia was present in 43% of patients. Route of delivery (n=47) was abdominal in 72%, vaginal in 15%, and was not accomplished in 13% prior to maternal death. Perinatal outcome (n=40) was successful in 75%, but abdominal in 72%, vaginal in 15%, and was not accomplished in 13% prior to maternal death.

RESULTS: Changes in cerebral blood flow velocity including systolic (SBP), diastolic (DBP) or mean arterial blood pressure (MAP) at term.(p>0.05) However, it was predictive of SBP, DBP, and MAP > 28 weeks gestation. (p<0.05) When maternal body mass index was controlled for this predictive value was no longer present.

CONCLUSIONS: Hyperinsuliniemia and/or insulin resistance may be major determinants of preeclampsia and/or BP during pregnancy.
161 SICKLE TRAIT IS NOT ASSOCIATED WITH AN INCREASED RISK FOR PREECLAMPSIA IN A COHORT OF 1,998 PREGNANT WOMEN. D. Stamilio, GA Macones, H Sehdev, MA Morgan. Dept. of OB/GYN, University of Pennsylvania Health System, Philadelphia, PA.

OBJECTIVE: Prior investigators have reported that sickle cell trait (SCT) positive women are at increased risk for developing pre-eclampsia. Our primary objective was to determine whether the SCT is independently associated with developing pre-eclampsia (PRE).

STUDY DESIGN: We performed a retrospective cohort study of 1,998 inner city pregnant patients who either did or did not have the SCT. All patients were screened for SCT using the “Sickledex” test. Data on potential confounding variables, and outcome data, including PRE (as defined by the American College of OB/GYN), birth weight, gestational age (GA) at delivery, and postpartum complications were abstracted. Unadjusted, stratified, and multiple logistic regression analyses were used to identify interactions, and confounding between multiple variables and postpartum complications between SCT and PRE. With an adjusted 7% rate of SCT, and p<0.05, this cohort study has 80% power to detect a relative risk (RR) of 2.25 for PRE.

RESULTS: Bivariate analysis revealed that the two cohorts were similar with regard to primiparity, maternal age, chronic diseases, birth weight, GA at delivery, but the SCT cohort was more likely to have gestational diabetes and had a higher mean body mass index. In the unadjusted bivariate analysis, the SCT cohort was not at increased risk for PRE (unadjusted RR=0.51, 95%CI (0.16-1.59)). After controlling for potential confounding variables with logistic regression analysis, the SCT was not independently associated with PRE (adjusted RR=0.49, 95%CI (0.15-1.60)).

CONCLUSION: In contrast to prior work, these data suggest that SCT is not an independent risk factor for PRE. In fact, the data are more consistent with SCT being protective for developing PRE.


OBJECTIVE: The ability to reliably predict severe pre-eclampsia (SPRE) would have great utility in performing interventional studies in the clinical management of pre-eclampsia. Although many authors have reported risk factors for pre-eclampsia, none have published a method to predict SPRE. Our objective was to develop a clinical prediction rule for SPRE using mid-trimester clinical factors and biochemical markers.

STUDY DESIGN: We performed a retrospective cohort study of all pregnant patients (N = 1,998) with single gestations from 1995-1997 who underwent mid-trimester multiple marker screening (MMS) between 15 and 20 weeks gestation for whom we have complete follow-up. By medical record review, we identified whether or not patients developed SPRE based on ACOG criteria. SPRE cases were compared to non-cases (all patients without SPRE) with respect to clinical data (demographics, screening mean arterial pressure [SAP], social & medical history) and MMS results. Using potential predictive factors identified in the bivariate & stratified analyses, both an explanatory logistic regression model and a clinical prediction rule were created. Patients were assigned a “predictive score” based on the presence or absence of predictive factors (1 point for each factor), and ROC analysis was used to identify the optimal score cut-off point for predicting SPRE, maximizing sensitivity & specificity.

RESULTS: Of the 1,998 patients, we identified 49 patients with SPRE (prevalence 2.5%). In the bivariate analysis, SPRE cases were more likely to be primiparous, have a history of pre-eclampsia, autoimmune diseases, chronic hypertension, had an elevated SAP (>90 mmHg), and were less likely to smoke tobacco. After controlling for confounding variables, cases and non-cases had similar β1-hCG, AFP and estriol levels, and the only variables that remained significantly associated with SPRE were primiparity (RR = 3.9, 95%CI 1.3-10.4), history of pre-eclampsia (RR = 2.9, 95%CI 0.9-8.8), and elevated SAP (RR = 5.7, 95%CI 2.0-14.8). Our predictive model for SPRE, which included only these 3 variables, had a sensitivity of 73% and a specificity of 58%, with an area under the ROC curve of 0.69.

CONCLUSION: Even after incorporating the stronger risk factors, our predictive model has only modest sensitivity & specificity for identifying patients at risk for developing SPRE. It appears that the addition of biochemical markers did not enhance the prediction of SPRE.
165 MGSO4 IS AN EFFECTIVE ANTIHYPERTENSIVE AGENT IN PREECLAMPSIA. MA Beljof, J Anthonea, J Ferrillb, L DeGradoa, G Saade, M Yaron, G Dildy and the Nmiodungpe Study Group. Depts of OB/GYN, Univ of Utah School of Med, SLG, UT, USA, Univ of Cape Town Med School, Cape Town, South Africa, Univ of Texas Med Branch, Galveston, TX, and Hospital Paroquial de San Bernado, Santiago, Chile.

OBJECTIVE: Since it has been stated that MgSO4 has a transient and minimal antihypertensive effect, we examined our experience in women with severe preeclampsia.

STUDY DESIGN: 140 women with SBP>160 and DBP>110mmHg at baseline, and who received MgSO4 (loading dose of 4-6 g in 200 ml NaCl over 20 minutes, then 2 g/hr), were studied. BP was recorded at baseline and then hourly. Patients who needed additional antihypertensive medication (AAM) to control their BP were compared with those who did not. AAM was given if BP was still >160/110mmHg 20 min after starting loading dose of MgSO4.

RESULTS: Demographics and baseline BP were not different between the two groups (179+/-16/118+/-7 vs 177+/-17/116+/-7 mmHg). 57/140 (41%) patients needed AAM. Scotoamata predicted the need for AAM, but with women HELLP, chronic HTN, headache, oliguria, epigastric pain or seizures were no more likely to need AAM than those without. MgSO4 had a significant effect on baseline BP within the first hour and this was sustained for up to 12 hours (Figure: Means+/-SE). The antihypertensive profile of MgSO4 alone was no different than that with AAM, and was not related to volume expansion. Maternal and neonatal morbidity were no different.

CONCLUSIONS: MgSO4 has a significant, sustained, antihypertensive effect in ~60% of severe preeclampsics. Patients with scotoamata are more likely to require AAM, but many severe preeclampsics will not need anything other than MgSO4 to control their BP.

166 OVULATION INDUCTION INFLUENCES MATERNAL SERUM MARKERS FOR DOWN SYNDROME AND NEURAL TUBE DEFECTS. R.L. Kramer, T.V. Comeaux,a C.L. Kowalczyk,a Y. Yaron,a B. Feldman,a M.P. Johnson, M.I. Evans, Dept of Ob/Gyn, Wayne State University/Hutzel Hospital, Detroit, MI.

OBJECTIVE: Previously published reports have shown alteration of serum marker levels after in vitro fertilization. We compared maternal serum alphafetoprotein (MSAFP) and human chorionic gonadotropin (hCG) in women who underwent successful ovulation induction (OI) and in those who did not.

STUDY DESIGN: We retrospectively evaluated MSAFP and hCG levels in 56 women undergoing OI. Patients were treated with any of the following regimens: FSH (Metrodin), FSH-LH (Pergonal), FSH/FSH-LH, or Clomiphene (Clomid). Values for serum are expressed as MOM's. There were 56 singleton pregnancies.

RESULTS: 21 patients underwent serum screening; all had normal outcomes for normal males (46,XY). Maternal cell contamination in cytogenetic testing, its true incidence was estimated by doubling the given number (4.1% versus 9.8%, p<0.0001). The same observation was noted in amniocentesis (0.05% versus 0.88%, p<0.0001).

CONCLUSIONS: 1. Maternal cell contamination is a major cause of cytogenetic abnormalities. 2. Maternal cell contamination in prenatal testing is common in patients with CPM. These patients should be counseled and managed as having high-risk pregnancies, our medical and counseling expertise, for evaluation and management of children with these conditions.

167 PSEUDOMOSAICISM FROM MATERNAL CELL CONTAMINATION & MUCH MORE PREVALENT WITH CYTOGENETICALLY ABNORMAL FETUSES. B. Feldman,a S.L. Hazana, S.A.D. Ebrahima, E.L. Krivichenia, M.P. Johnson, M.I. Evans. Division of Reproductive Genetics, Department of Ob/Gyn, Wayne State University, Detroit, MI.

OBJECTIVE: To evaluate the incidence of mosaicism resulting from the growth of maternal cells in cytogenetically normal and abnormal samples.

STUDY DESIGN: Retrospective analysis of maternal contamination in all consecutive prenatal samples received in our cytogenetic laboratory at Wayne State University during the period of January 1989 to June 1998.

RESULTS: 25,127 samples (19,260 amniocenteses and 5857 chorionic villus samplings (CVS)) were analyzed in our cytogenetic laboratory during the period included in the study. A total of 927 cases (102 after CVS and 225 after amniocentesis) with the most common prenatal aneuploidies (trisomies 18, 19, and 21, and monosomy-X) were diagnosed. Pseudomosaicism resulting from maternal contamination was detected in 31 (1.2%) samples (7 amniocenteses and 24 CVS's). Maternal contamination was detected 10 times more in chorionic villus-samplings compared to amniocentesis (4.1% vs 0.45%, respectively, p<0.0001).

In 12 (38.7%) of the 31 cases with pseudomosaicism from maternal cell contamination, the fetal karyotype was found to be abnormal. Four cases of trisomy-21, 4 cases of trisomy-18, 1 case of trisomy-15 and 3 cases of 45X were diagnosed.

The incidence of maternal contamination in cytogenetically abnormal fetuses was compared to normal fetuses. Since maternal cell contamination in OS samples is significantly higher when the fetal cell line is abnormal (0.9% versus 9.8%, p<0.0001).igin.

CONCLUSIONS: 1. Maternal cell contamination is a major cause of prenatal aneuploidies. 2. Maternal cell contamination in prenatal testing is common in patients with CPM. Our data suggest that abnormal cells, namely the aneuploidic fetal cells, are more permissive to maternal cell growth in culture. 3. The presence of maternal cell growth should heighten concern for aneuploidy.

168 PREGNANCY OUTCOMES OF CONFINED PLACENTAL MOSAICISM-

A 10 YEARS STUDY. B. Feldman,a S.L. Hazana, S.A.D. Ebrahima, E.L. Krivichenia, A. Druggana, M.P. Johnson, M.I. Evans. Division of Reproductive Genetics, Department of Ob/Gyn, Wayne State University, Detroit, MI.

OBJECTIVE: Reported data on the outcome of pregnancies complicated by confined placental mosaicism (CPM) are conflicting. The present study was designed to evaluate the outcome of pregnancies complicated by CPM, diagnosed in our center during the last 10 years.

STUDY DESIGN: 50 cases of CPM were identified from retrospective analysis of 25,127 consecutive prenatal samples received in our cytogenetic laboratory at Wayne State University from 1/1989 to 6/1998. Pregnant outcomes were compared with a matched control group of 50 patients with preeclampsia.

RESULTS: CPM was confirmed prenatally in 46 (92%) and postnatally in 19 (38%) patients. The abnormal cytogenetic cell types were aneuploid in 45 cases, 6 deletions, 2 additions and 2 markers. Follow-up information was available for 42 patients, out of which, early childhood follow-up information was available for 31 cases.

Of 42 cases with CPM and available follow-up information, 1 pregnancy was terminated and 2(4.7%) cases ended in fetal or early neonatal loss. Premature deliveries (46%;25) were significantly higher in the CPM group as compared to control [7/41(17%) and 0/30(0%), p<.02]. Gestational age at delivery was earlier (37+5.8 and 39+1.4 wk's, p<.007), and birth weight significantly lower in the study group (2968+312 and 3556+501 grams, p<0.0001). Low birth weight (<10 percentile) was noted in 18/42 cases with CPM as compared to 1/30 control cases (p<0.05). No significant congenital anomalies were detected in either CPM or control patients. Early childhood follow-up (range: 6 months to 10 years, median: 2 years) revealed normal development without any major health problems in all 31 CPM cases.

CONCLUSIONS: CPM and fetal and neonatal losses, premature delivery, intrapartum growth retardation and low birth weight are significantly more frequent in CPM than in control patients. Early childhood follow-up was available in 42 cases, 6 deletions, 2 additions and 2 markers. Follow-up information was available for 42 patients, out of which, early childhood follow-up information was available for 31 cases.

There were no significant AFP differences (P<NS) among the different drug regimens. A significant difference was noted among hCG levels (P<0.05). Compared to all pairs revealed a significant difference in hCG levels between the patients receiving FSH-LH and those receiving only FSH. However, when the subjects were pooled and values compared with the population mean, a significant difference was noted for hCG levels (P<0.008).

CONCLUSION: hCG levels may be significantly higher in women conceived after administration of FSH-LH for ovulation induction which may alter the calculated risk of having a fetus with Down syndrome. In order for patients to be counseled adequately about undergoing prenatal diagnosis, the influence of ovulation induction with gonadotropins hCG levels may need to be considered.

OBJECTIVE: We describe our experience with FISH as a tool to help establish the precise prenatal diagnosis of pregnancies complicated by chromosome abnormalities detected by standard cytogenetic evaluation.

STUDY DESIGN: FISH for chromosomes 13,18,21, X and Y for genetic prenatal diagnosis of high-risk pregnancies has been routinely performed in our center for 5 years. We prospectively identified all the prenatal cases, evaluated in our lab between 4/1996 and 6/1996, in which FISH was used to help establish the diagnosis. The chromosome abnormalities of all cases included in the study were detected by standard cytogenetic examination. FISH was used to answer specific questions of clinical relevance. Aneuploidies detected by routine FISH studies were excluded.

RESULTS: 4184 prenatal samples (802 chorionic villous samplings (CVS) and 3379 amniotic fluids) were analyzed. Of all 162 chromosome abnormalities detected, about a half (86) were not simple aneuploidy. FISH was employed in 27(30%) of those cases.

We identified three groups of patients with chromosome abnormalities, in which FISH studies helped establish the diagnosis or answer specific, clinically relevant, questions. All studies were done within 24 hours and were informative:

1. Establish or rule out involvement of specific critical regions in rearrangements like translocations, inversions and deletions (18-cases).
2. Identification of marker chromosomes (3-cases).
3. Quick counting of a large number of normal and abnormal cells in mosaic with aneuploidic cell-line (6-cases).

CONCLUSION: During the last few years, FISH has been established as a routine test for prenatal detection of the most common aneuploidies in many clinical cytogenetic laboratories. However, with the technical expertise earned, the availability of numerous, highly reliable probes, and with the recognition of its high sensitivity and specificity, FISH can effectively be used in other tasks in the clinical cytogenetic laboratory.

170 THE FISCAL IMPACT OF A POTENTIAL LEGISLATIVE BAN ON SECOND TRIMESTER, MEDICALLY INDICATED ABORTIONS. V. Miller*, S.B. Ransom*, M.A. Ayoub*, E.L. Krivchenia*, M.I. Evans. Dept. Ob/Gyn, Wayne State University/Hutzel Hospital, Detroit, MI.

OBJECTIVE: Given political attempts to restrict abortion access, this study was designed to determine the fiscal impact of a legislative ban on medically indicated second trimester abortions.

STUDY DESIGN: A fiscal cost comparison was completed for patients who had a second trimester termination, versus not allowing the procedure, for medical indications including fetal abnormalities at Hutzel Hospital/Wayne State University in Detroit, MI. An eight year database of genetic cases, hospital and physician cost estimates for performing medically indicated terminations, and published reports of the average lifetime costs per selected birth defects were used to calculate the net cost.

RESULTS: The estimated lifetime cost for an average cohort year of a legislative ban on medically indicated second trimester abortions would be at least $7.5 million dollars for patients treated at Hutzel Hospital alone. (Table shows selected examples).

<table>
<thead>
<tr>
<th>Indication</th>
<th>#2nd TM VIP</th>
<th>Mean/Year</th>
<th>Estimated lifetime cost/year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trisomy 21</td>
<td>84</td>
<td>10.5</td>
<td>4,735,500</td>
</tr>
<tr>
<td>NTD</td>
<td>45</td>
<td>5.6</td>
<td>1,746,400</td>
</tr>
<tr>
<td>All Cases</td>
<td>514</td>
<td>64.2</td>
<td>$7,556,100</td>
</tr>
</tbody>
</table>

Extrapolated in Michigan, the cost would be $74 million, and nationally, the cost would be $2 billion per year.

CONCLUSION: As the health and social policy debate surrounding second trimester abortions continues, the economic implications of a legislative ban on medically indicated procedures may be a useful tool to aid the decision-making process.


OBJECTIVE: To compare the predictive value of urinary BCF to second trimester serum marker screening.

METHODS: 168 singleton patients (144 normal pregnancies and 22 DS) had urine samples collected prior to CVS or amniocentesis at 9-23 weeks. Urinary BCF was determined by the B210 two-step "sandwich" assay and normalized to urine creatinine. Values were expressed as GA-corrected multiples of the median (MoM). 78 patients also had second trimester screening using maternal serum alpha-fetoprotein (MSAFP), βhCG, and unconjugated estrol. The other 66 patients were either too early or too late for routine screening. These were compared with results for urinary BCF in the same patients.

RESULTS: Urinary BCF declined with gestational age following a logarithmic curve in the normal patients. A cutoff of 2.2 MoM was found to have the best predictive value for DS by ROC curve analysis.

<table>
<thead>
<tr>
<th>Urinary BCF Cutoff=2.2 MoM</th>
<th>Triple Screen Cutoff=1:270</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>168</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>46%</td>
</tr>
<tr>
<td>Specificity</td>
<td>80%</td>
</tr>
<tr>
<td>Positive predictive value</td>
<td>32%</td>
</tr>
<tr>
<td>Negative predictive value</td>
<td>68%</td>
</tr>
</tbody>
</table>

CONCLUSIONS: In this series of late first trimester and second trimester patients already at high risk, BCF does not equal second trimester serum marker screening efficacy, and suggests the need for a further search for new markers.


OBJECTIVE: We have previously shown that abnormal biochemical screening (ABS) results are more common, but less ominous in female fetuses. Here we evaluate whether the male:female (M:F) ratio is discordant in young patients (<35 years) evaluated for SMDS.

STUDY DESIGN: From 1992-1999, fetal karyotypes from amniocenteses indicated solely for SMDS (study group) were compared with results for urinary BCF in the same patients.

RESULTS: 274 amniocenteses were performed in study patients (Table). A highly significant difference (higher M:F ratio, p<0.001, CI 1.3-2.4) between the SMDS and ABS groups was found. The M:F ratio was also significantly higher (p=0.018, CI 0.3-0.9) in fetuses with nuchal edema or transhyunence (NT) than in patients with other SMDS.

<table>
<thead>
<tr>
<th>Indication</th>
<th>Male</th>
<th>Female</th>
<th>M:F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nuchal edema/NT</td>
<td>117</td>
<td>53</td>
<td>2.21</td>
</tr>
<tr>
<td>Other markers*</td>
<td>56</td>
<td>48</td>
<td>1.21</td>
</tr>
<tr>
<td>Total ultrasound</td>
<td>173</td>
<td>101</td>
<td>1.71</td>
</tr>
<tr>
<td>Abnormal BS</td>
<td>252</td>
<td>267</td>
<td>0.91</td>
</tr>
<tr>
<td>Total</td>
<td>519</td>
<td>25</td>
<td></td>
</tr>
</tbody>
</table>
173 URINE B-CORE FRAGMENT VS SERUM TRIPLE SCREEN FOR MID-TRIMESTER DOWN SYNDROME DETECTION. Babahsan-Sangh R, Oz Y, Hunter D, Clemik D, Flores D, Acuna E, Rinne K, Stuller R, Shahab S, Bozaki T, Mahoney M, Baumgarten A, Cole L, Dept. OB/GYN, Yale School of Medicine, New Haven, CT, Bridgeport Hospital, Bridgeport, CT, Norwalk Hospital, Norwalk, CT.

PURPOSE: Several recent publications have suggested that a single urine test is equal to or superior to the serum triple screen. No direct comparison have been published thus far however. We compared the Down syndrome (DS) screening efficiency of urine B-core fragment with the traditional triple screen.

METHOD: Urine B-core fragment and serum analyte(s) were measured prospectively in singleton pregnancies undergoing mid-trimester genetic amniocentesis. In some cases only serum was measured initially and BCG and uE3 was subsequently determined from the stored specimens. The Down syndrome screening efficiency of urine B-core plus maternal age was compared to the traditional triple screen. ROC curves were generated for each algorithm and the areas under the curves were compared to determine which algorithm was superior.

RESULTS: There were a total of 932 study cases of which 21 (2.5%) had DS. A total of 496 women, (4 with Down syndrome) had serum AFP alone measured initially. Urine B-core fragment had a 61.1% detection rate and a 4.9% false positive rate (FPR) for DS, while the values for the triple screen were 61.1% and 17.6% respectively. At a risk threshold of 1/270 the sensitivity and FPR were 90% and 10.7% for B-core fragment and 71.4% and 56.7% for the triple screen. The area (SE) under the ROC curve for urine B-core was 0.8904 (0.057), and for triple screen was 0.7462 (0.072). The difference in areas was significant, p<0.0001.

CONCLUSION: In the first reported comparison in the same patients, we observed a superior Down syndrome screening efficiency of urine B-core fragment compared to the serum triple screen. The superior performance and the reduced cost (single vs triple analyte test) supports large scale testing and evaluation of urine Down syndrome screening as an alternative to the traditional triple screen.


OBJECTIVE: To determine if there are any indication-specific differences in the accuracy of second-trimester genetic sonography to detect fetal trisomy 21.

STUDY DESIGN: From November 1992 to June 1998, a mid-trimester genetic sonography program was offered to all women who were at an increased risk for fetal trisomy 21 (1/274) because of advanced (≥ 35 years) maternal age (AMA), abnormal serum biochemistry, or both. In addition to standard fetal biometry the following aneuploidy markers were evaluated: structural anomalies (including face, hands, and cardiac anomalies), abdominal anomalies (including diaphragm hernia and omphalocele), short femur, small humerus, pyelectasis, nuchal fold thickening, echogenic bowel, choroid plexus cysts, hypoplastic middle phalanx of the fifth digit, sandal gap, 2-vessel umbilical cord, and since October 1997, echogenic intracardiac focus. The following areas were evaluated: cardiac (n=13), central nervous system (n=10), gastrointestinal (n=6), renal (n=2), chest (n=2), extremities including hands/feet (n=21), face/neck/ear (n=13), umbilical cord (n=4), growth restriction (n=7) and hydrops (n=1). The table below compares the frequency of aneuploidy by indication in 5 groups:

<table>
<thead>
<tr>
<th>Group</th>
<th>Frequency of Aneuploidy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isolated CPCs (n=98)</td>
<td>0</td>
</tr>
<tr>
<td>CPCs with aneuploidy markers (n=9)</td>
<td>0</td>
</tr>
<tr>
<td>CPCs with major anatomic abnormalities (n=13)</td>
<td>13 (100%) trisomy 18</td>
</tr>
</tbody>
</table>

From the 98 isolated CPCs, 79% of the neonates (n=95) were normal at birth. The other 3 fetuses with isolated CPCs had the following prenatal abnormalities: bilat. spina bifida, and right club foot. In the group of fetuses with CPCs and aneuploidy markers, 95% (9/10) were normal at birth and we had one hydrocoele. All 15 fetuses with CPC and major anatomic abnormalities had karyotypically confirmed trisomy 18.

CONCLUSIONS: In experienced hands, when routinely performing a complete anatomic sonographic survey, only patients with fetuses having both CPCs and major anatomic abnormalities have a very high frequency of having aneuploidy. Therefore, aneuploidy is ruled out in trisomy 18 should not be routinely considered for isolated CPCs but only if associated with major anatomic abnormalities.

175 ISOLATED VS. NON-ISOLATED CHORDOID PLEXUS CYSTS: THEIR RELATIONSHIP TO ANEUPLOIDY AND OTHER CONGENITAL ANOMALIES. Li, Bu C, Gurman, AM Vastides, JC Smulian, C Walters*, R Bakshi. UMDNJ-Robert Wood Johnson Medical School/St. Peter's Medical Center, New Brunswick, NJ.

OBJECTIVE: To determine if the risk of aneuploidy and other congenital anomalies when fetal trisomy 21 (CPDs) are present on prenatal ultrasound (US) in isolation vs association with other abnormalities when performing a complete anatomic survey.

STUDY DESIGN: All patients with singleton fetuses having CPDs were identified retrospectively from our E/S database (1994-1998). In our unit, in addition to the following American Institute of U/S in Medicine guidelines, all US examinations were also supplemented by the following: face/neck (including nuchal fold thickness), cardiac (4 chamber views and outflow tracts, aortic and ductal arches), all extremities and long bones (including hands/feet) and genitilia. Neonatal records of all infants with CPDs who delivered at our institution were also reviewed. The following information was recorded: all sonographic findings from a complete anatomic survey, karyotype results and results of neonatal examination. According to these findings, patients were divided into two groups: isolated (n=35) and symptomatic (n=7) and were stratified for aneuploidy, and CPDs with major congenital anomalies. The frequency/type of abnormal fetal karyotype and congenital anomalies at birth were compared among the two groups.

RESULTS: A total of 310 cases of CPDs were identified, of these, 120 had information available about perinatal outcome. Ninety-eight cases had isolated CPDs. Nine had CPDs with aneuploidy markers: 5 of which =< 35 years old and uE3 was subsequently determined from the stored specimens). The difference in areas was significant, p<0.0001.

CONCLUSIONS: In the first reported comparison in the same patients, we observed a superior Down syndrome screening efficiency of urine B-core fragment compared to the serum triple screen. The superior performance and the reduced cost (single vs triple analyte test) supports large scale testing and evaluation of urine Down syndrome screening as an alternative to the traditional triple screen.

176 SELECTING AN OPTIMAL STRATEGY FOR SECOND TRIMESTER TRISOMY 18 SCREENING. P Bennett, MP Le, T Beazoglou*, JF Rodis. Division of Human Genetics, Dept. of Pediatrics, Uniform of CT Health Center, Farmington, CT.

OBJECTIVE: To select an optimal trisomy 18 screening protocol based on second trimester measurements of maternal serum analytes (MSAFP) and human chorionic gonadotropin (hCG) and unconjugated estriol (uE3).

STUDY DESIGN: A computer simulation (Reynolds et al Obstet Gynecol 1995; 86:147) of the MSAFP, hCG and uE3 values in normal pregnancies and those with trisomy 18 was carried out using computer derived means, standard deviations and correlation coefficients (Palomaki et al Prenat Diagn 1995;15:713). Detection rates (DR) and false-positive rates (FPR) were established by determining the proportions of cases with analytes below cut-off using the multi maternal age-specific thresholds. Overall test efficiency was determined for pregnant women with the 1995 USA maternal age distribution.

RESULTS: Expected DR and FPR using analytic values below fixed cut-off (MoM):

<table>
<thead>
<tr>
<th>MSAFP</th>
<th>hCG</th>
<th>uE3</th>
<th>DR (%)</th>
<th>FPR (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.75</td>
<td>0.55</td>
<td>0.60</td>
<td>54</td>
<td>0.09</td>
</tr>
<tr>
<td>0.80</td>
<td>0.60</td>
<td>0.50</td>
<td>49</td>
<td>0.06</td>
</tr>
<tr>
<td>0.85</td>
<td>0.60</td>
<td>0.45</td>
<td>40</td>
<td>0.05</td>
</tr>
</tbody>
</table>

Expected DR and FPR using a second trimester risk cutoff:

<table>
<thead>
<tr>
<th>Risk cut-off</th>
<th>DR (%)</th>
<th>FPR (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:50</td>
<td>64.1</td>
<td>0.01</td>
</tr>
<tr>
<td>1:100</td>
<td>79.4</td>
<td>0.25</td>
</tr>
<tr>
<td>1:200</td>
<td>74.4</td>
<td>0.51</td>
</tr>
</tbody>
</table>

For the risk-based method, the FPR is strongly dependent on maternal age. For example, using the 1:100 cut-off for women ≥ 35 years old, the FPR is 0.16% versus 0.96% in those <35.

CONCLUSIONS: Contrary to early reports, the widely used fixed cut-off method does not appear to be capable of providing a high DR in combination with a low FPR. The risk-based approach is much more efficient. We have chosen to use a second trimester risk of 1:100 which results in a 70.4% detection rate of trisomy 18 with a false positive rate of only 0.25%.

177 ELEVATE CONTOUSC Clinical Genet. of CT Ob/Gyn screening

STUDY: elevated received (0.57) (>0.70Mo) abnormal gestation the two significant signals REZU MSAFP: I MSAFP: f/i which 4 elevated I MSAFP w/ abnormal cervix INFERRED gestation is not normal CONCLUSION: MSAFP is an outcome: common chromosomal abnormality.
ELEVATED MATERNAL SERUM \( \alpha \)-FETOPROTEIN WITH LOW UN-
CONJUGATED ESTRIOL AND THE RISK FOR LETHAL PERINATAL
OUTCOME. P Benedt, A Craffey, D Horne, L Ramsdell, BF Rodis. Div. of
Gyn. Genetics, Dept. of Pediat., and Div. of MFM, Dept. of Ob/Gyn, Univ.
of CT Health Center, Farmington, CT.

OBJECTIVE: To evaluate the addition of unconjugated estriol (E3) to
maternal serum \( \alpha \)-fetoprotein (MSAFP) in neural tube defect (NTD)
screening programs.

STUDY DESIGN: Pregnancy outcomes were reviewed for women with
elevated MSAFP (\geq 2.0MoM) from our database of 49,626 women who had
received triple marker testing from 1991-1996. Outcomes for those with low
E3 (\leq 0.7MoM) were compared with those with normal or elevated E3
(>0.7MoM). The incidences of fetal death, NTD, chromosomal
abnormalities, congenital abnormalities, preterm birth, small-for-
gestational age (SGA), twins, and inaccurate dates were compared between
the two groups using \( \chi^2 \) and Fisher's exact test with \( p < 0.05 \) considered
significant.

RESULTS: Of the 49,626 women screened, 1,336 (2.7%) had an elevated
MSAFP. Pregnancy outcomes were obtained in 97% of those with elevated
MSAFP and in 74% of all patients screened. NTDs were present in 52
fetuses/infants (29 anencephalic, 25 spina bifida, 7 encephalocele) of which 45
(83%) were an elevated E3. Of the 1,336 women with an elevated
MSAFP, 191 (14%) had a low E3. Outcomes for those with elevated
MSAFP with or without low E3 are shown below:

<table>
<thead>
<tr>
<th>Outcome</th>
<th>E3 \leq 0.7MoM</th>
<th>E3 &gt; 0.7MoM</th>
<th>RR</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>fetal death</td>
<td>n (%)</td>
<td>n (%)</td>
<td>6.6</td>
<td>\leq 0.001</td>
</tr>
<tr>
<td>anencephaly</td>
<td>17 (8.9)</td>
<td>35 (3.1)</td>
<td>111.8</td>
<td>\leq 0.001</td>
</tr>
<tr>
<td>preterm birth</td>
<td>29 (15.2)</td>
<td>195 (17.1)</td>
<td>9.9</td>
<td>ns</td>
</tr>
<tr>
<td>SGA</td>
<td>22 (11.5)</td>
<td>70 (6.1)</td>
<td>2.0</td>
<td>\leq 0.05</td>
</tr>
<tr>
<td>twins</td>
<td>1 (0.5)</td>
<td>94 (8.2)</td>
<td>0.1</td>
<td>\leq 0.001</td>
</tr>
<tr>
<td>inaccurate dates</td>
<td>0 (0)</td>
<td>23 (2.0)</td>
<td>0</td>
<td>\leq 0.05</td>
</tr>
<tr>
<td>normal</td>
<td>77 (40.3)</td>
<td>629 (54.9)</td>
<td>0.6</td>
<td>\leq 0.001</td>
</tr>
</tbody>
</table>

CONCLUSIONS: Pregnancies complicated by elevated 2nd trimester
MSAFP and low E3 are at particularly high risk (29%) for lethal perinatal
outcomes including: fetal death (17%), anencephaly (9%), and
chromosomal abnormalities (5%). Twins and inaccurate dates, while
common causes of elevated MSAFP, are rarely found when an elevated
MSAFP is associated with a low E3.

ULTRASOUND DATING DOES NOT IMPROVE MULTIPLE MARKER
SCREENING TEST PERFORMANCE. K.D. Winsstrom, J. Owen, L. Boots, M.
DulBarth, Dept. OB/GYN, Univ. of Alabama at Birmingham, Birmingham, AL.

OBJECTIVE: To determine whether universal ultrasound dating improves
performance of the multiple marker screening test for Down syndrome (DS).

STUDY DESIGN: We selected all patients who had a second trimester
date marker screening test (MMST: AFP, estriol, hCG) and a reported
LMP and a complete ultrasound (US) exam and a genetic amniocentesis at
our institution from July 1993 to July 1998. We calculated the false positive
rate (FP%) and the DS detection rate (Det%) at risk cutoffs ranging from
1:150 to 1:900 after changing the algorithm to utilize 1) ultrasound dates
(based on BPD) exclusively; 2) LMP if within 7 days of US dates; 3) LMP if
within 10 days of US dates; and 4) LMP if within 14 days of US dates.

RESULTS: 3,602 patients including 39 DS cases met all criteria; the mean
gestational age was 36.3 \pm 4.1 \text{ days}. Data at 4 representative screening risk
cutoffs are provided:

<table>
<thead>
<tr>
<th>US (US \leq 7d)</th>
<th>LMP (US \leq 15d)</th>
<th>LMP (US \leq 10d)</th>
<th>LMP (US \leq 1d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cut-Off</td>
<td>FP%</td>
<td>Det%</td>
<td>FP%</td>
</tr>
<tr>
<td>1:150</td>
<td>20.5</td>
<td>69.2</td>
<td>19.7</td>
</tr>
<tr>
<td>1:190</td>
<td>24.5</td>
<td>74.4</td>
<td>23.7</td>
</tr>
<tr>
<td>1:270</td>
<td>31.0</td>
<td>84.6</td>
<td>30.5</td>
</tr>
<tr>
<td>1:350</td>
<td>32.9</td>
<td>84.6</td>
<td>32.4</td>
</tr>
</tbody>
</table>

CONCLUSIONS: Across a wide range of risk cutoffs we found very little
difference in both the false positive rates and the DS detection rates when
either the US date or the LMP date was used for calculation of DS risk, even
when the US date was only within 14 days of the LMP date. Within a range
of up to 14 days from the LMP, we cannot recommend preferential use of
the US dates in the MMST.

A FIVE YEAR EXPERIENCE WITH FRAGILE X SCREENING OF HIGH
RISK GRAVIDAS. K.D. Winsstrom, M. Descartes, J. Franklin, S.P. Clever,
Dept. of OB/GYN, University of Alabama at Birmingham, Birmingham, AL.

OBJECTIVE: To compare our 5 year program of prenatal Fragile X
screening of high risk gravidas to our program of Fragile X testing of
affected individuals (proband).

STUDY DESIGN: All women referred to the prenatal genetics clinic from
1994 to 1998 for counselling and ultrasound/amniocentesis and who had a
family history of nonspecific mental retardation, learning problems,
cerebral palsy, autism, or attention deficit disorder (known Fragile X
families excluded) were offered molecular Fragile X screening using the
Ss12.3 gene probe (INSERN<Strasburg). Results were compared to those of
probands with the same diagnoses who underwent Fragile X testing
during the same time period.

RESULTS: 12,349 prenatal patients were evaluated from 1994 to 1998 of
which 263 (2.1%) had a positive family history and underwent Fragile X
testing. 189 (72.7%) were white, 25.5% (69) were black. Of the 232
patients who had living children, only 35 (15%) had an affected child;
other indications for testing were: affected 1st degree relative (31%),
1st degree relative (33%), 2nd degree relative (33%), patient (14%), or partner (5.8%); 46% had multiple affected relatives. No mutations or pre-mutations were identified;
the median number of triplet repeats was 29, as was the median largest
number of repeats. In contrast, 589 affected probands underwent Fragile X
testing during the same time period with 10 positive results (1.7%; 7 full
mutations and 3 pre-mutations), a significant difference (10/589 vs. 0/263,
\text{P} < 0.005).

CONCLUSIONS: Testing the affected proband is superior to screening
the pregnant relative of the proband for identification of families at risk for
Fragile X. This confirms other data that a family history of mental
impairment does not necessarily increase Fragile X risk. It may not be
possible to select appropriate candidates for Fragile X screening
from the general obstetric population.
183 CONTRIBUTION OF AUTOPIST, PLACENTAL PATHOLOGY AND CHROMOSOMAL ANALYSIS TO THE DIAGNOSIS OF MULTIPLE MALE INFANTS IN UTERO: OBJECTIVE: To determine the extent to which autopsy, placental pathology and karyotype analysis contribute in establishing or confirming the diagnosis of intrauterine male infants. STUDY DESIGN: A retrospective review of all male fetuses born at <32 weeks gestation in the last 10 years at a large tertiary-care teaching hospital was performed. RESULTS: Among 199 singleton pregnancies where a male fetus was delivered at <32 weeks gestation, 117 were reviewed. In 75 of these cases (64%), male fetuses were delivered, 72 of whom (96%) had a single clone bearing chromosomal aberrations in their fetal karyotypes. CONCLUSION: The desire to pursue invasive prenatal diagnosis may not be a clinically identifiable cause. Utility of karyotype was limited by culture failure (48%).

182 IS THE DECISION TO HAVE INVASIVE PREGNATAL DIAGNOSIS BASED ON THE TRIPLE SCREEN RESULT? OBJECTIVE: To study possible correlations between various obstetric parameters and the appearance of a single clone bearing chromosomal aberration in cultured amniocytes. STUDY DESIGN: The chromosomes of amniocytes obtained from amniocentesis (n=158) were examined by G-banding and karyotyping. Statistical evaluation was done by using the McNemar test. RESULTS: Single clone bearing chromosomal aberration was found in 158 out of 2340 specimens (6.8%). Mean maternal age was 32.6±5.3 years and mean gestational age was 21.2±1.3 weeks. No correlation was found between the appearance of a single aberration and the gender of the fetus, the quality of amniotic fluid, the gestational age, maternal age and the culture conditions. The most frequent chromosomal changes observed were deletions (71%), followed by translocations (28.7%). The chromosomes more frequently involved in these aberrations are shown in the table.

184 SINGLE CLONE BEARING CHROMOSOMAL ABERRATIONS IN AMNIONCCECTIC FLUID CULTURE. OBJECTIVE: To study possible correlations between various obstetric parameters and the appearance of a single clone bearing chromosomal aberration in cultured amniocytes. STUDY DESIGN: During September 1996 and February 1998, 290 amniotic fluid specimens obtained by routine amniocentesis and harrned by an in situ fixation technique, were analyzed. The study population consisted of all cultures (n=158) which contained a single clone bearing chromosomal aberration. Demographic and obstetrical characteristics, addition to genetic findings, were recorded. Statistical evaluation was done by using the McNemar test. RESULTS: Single clone bearing chromosomal aberration was found in 158 out of 2340 specimens (6.8%). Mean maternal age was 32.6±5.3 years and mean gestational age was 21.2±1.3 weeks. No correlation was found between the appearance of a single aberration and the gender of the fetus, the quality of amniotic fluid, the gestational age, maternal age and the culture conditions. The most frequent chromosomal changes observed were deletions (71%), followed by translocations (28.7%). The chromosomes more frequently involved in these aberrations are shown in the table.

OBJECTIVE: To determine the value of free β-hCG, PAPP-A and nuchal translucency (NT) for the determine of first trimester Down Syndrome (DS) screening.

STUDY DESIGN: 11 DS and 469 unaffected control were evaluated biochemically and NT was measured by 3-dimensional ultrasonography between 10-13 weeks gestation. Cases were obtained prospectively prior to chorionic villus sampling or amniocentesis in high risk pregnancies. Multiples of the median (MOM) for gestational age and correlations for DS and unaffected pregnancies were determined. Detection efficiency was calculated based on biochemical parameters and NT.

RESULT: There were 11 DS cases among 480 singleton pregnancies between 10-13 weeks gestation. Detection rate for Down Syndrome was 81.8% at 5% false positive rate (FPR) and 6.8% screening positive rate, positive predictive value was 28.1%.

CONCLUSIONS: By combination of biochemically (free β-hCG, PAPP-A) and NT measurement, a relatively high Down Syndrome detection rate (81.8%) was achieved at 5% false positive rate in high risk pregnancies. But this method could not be an alternative to routine amniocentesis for the DS detection in high risk pregnancies (Age ≥ 35, previous chromosomally abnormal pregnancy etc.)

186 THE COMMON ANEUPLOIDIES: THE CHOICE OF PREGNANCY TERMINATION IS NOT UNIVERSAL. S. Reisert, D. Bianchi, S. Craigo, M.E. D’Alton. Division of Maternal-Fetal Medicine, Tufts University/New England Medical Center, Boston, MA.

OBJECTIVE: The goal of this study was to review the experience with prenatal diagnoses of aneuploidy at a single tertiary center to determine how the specific diagnosis influenced decisions made about termination of pregnancy.

STUDY DESIGN: A review of our prenatal database since 1994 was performed to identify pregnancies diagnosed with the four most common aneuploidies (Trisomy 21, Trisomy 18, Monosomy X, and Trisomy 13). Outcomes were obtained from the database as well as from hospital medical records. Statistical analysis was performed with a chi-squared test where appropriate.

RESULTS: Sixty pregnancies were identified with the following distribution: Trisomy 21 (n=51), Trisomy 18 (n=15), Monosomy X (n=11), and Trisomy 13 (n=5). The mean gestational age at diagnosis was 21.5 weeks (range: 13-37 weeks). All patients were counseled by a multidisciplinary team of perinatologists, geneticists, and pediatric subspecialists when appropriate. Pregnancy termination was offered if the diagnosis was made prior to 24 weeks gestation; after this gestational age, referral to an out-of-state center was made if desired. Of the 60 aneuploid diagnoses identified, 12 (20%) were diagnosed after 24 weeks gestation; none of these women opted for termination. Of the remaining 48 pregnancies, 71% opted for pregnancy termination. However, compared to the overall group, this rate varied with the diagnosis and was 100% for Trisomy 13 (p<0.001), 90% for Trisomy 18 (p<0.001), 67% for Monosomy X (NS), and 62% for Trisomy 21 (NS).

CONCLUSIONS: Although termination of pregnancy for the common trisomies and Monosomy X is routinely offered at our institution, it is by no means universally chosen by our patients who receive these diagnoses at gestational ages when termination is permissible by state law. At our institution, almost 40% of women with unaffected diagnoses with Trisomy 21 before 24 weeks gestation choose to continue their pregnancies; this is higher than continuation rates reported from other institutions. In addition, there are significant differences in the termination rates for each individual diagnosis with much higher rates of termination for Trisomy 13 and Trisomy 18. Further research is necessary to show whether women who choose to continue abnormal pregnancies benefit from the information obtained from prenatal diagnosis.


OBJECTIVE: Dark brown fluid at genetic amniocentesis has been associated with an increased risk of aneuploidy. We calculated the incidence of aneuploidy karyotypes in dark fluid samples obtained over a 9-year period.

STUDY DESIGN: The karyotypes of all samples of dark amniotic fluid obtained from October 1989 to July 1998 were reviewed. Genetic amniocentesis for maternal age, or risk of aneuploidy or neural tube defect, was performed between 15 and 24 weeks of gestation; 30 cc of fluid was routinely obtained. Anamnestic fluid was coded as dark if it was brownish-colored with increased opacity.

RESULTS: Dark fluid was identified in 142 (1.66%) of 8,556 amniocentesis samples. Two aneuploid karyotypes (1.41%) were identified: one had trisomy 13, and one was mosaic for Turner syndrome. In addition, two of the 142 karyotypes were normal variants: one was a 13:14 Robertsonian translocation, and another was a pericentric inversion of chromosome 9. An additional 2 karyotypes were culture artifacts or placental mosaicism.

CONCLUSIONS: Dark fluid has been reported to occur in 1-2% of genetic amniocentesis samples, and our incidence (1.66%) is in agreement. In this relatively large series, the observed incidence of aneuploidy in dark amniotic fluid was 1.41%. Dark fluid may indicate an increased incidence of aneuploidy; the incidence in this study, however, was relatively low.

188 BEHAVIORAL CHANGES IN DEVELOPING MICE AFTER PRENATAL EXPOSURE TO PAROXETINE (PAXIL). F. Coleman, D. Christensen, C. Gonzalez, W. Rayburn, Dept OB/Gyn and Pharmacol/Toxicol, Univ Oklahoma, Okla City, OK.

OBJECTIVE: To conduct, in a randomized placebo-controlled manner, behavioral testing on mice offspring exposed prenatally to the antidepressant selective serotonin reuptake inhibitor paroxetine (Paxil).

STUDY DESIGN: Paroxetine and a placebo were consumed by CD-1 mice for 2 weeks before conception and throughout gestation. The daily dose of paroxetine decreased from 30 mg/kg/d during the preconception period to 23 mg/kg/d at midgestation. This dose will achieve serum concentrations equivalent to the upper therapeutic level in humans. On postnatal day 5, the 11 paroxetine and the 12 placebo treated litters were reduced to 8 pups per litter. Behavioral testing consisted of two early developmental tasks of geotaxis and homing, followed by motor, anxiety and depression assessment into adulthood.

RESULTS: Offspring in both treatment groups showed no statistical differences in the early developmental tasks or in locomotor and exploratory activity throughout development. Depression task (forced swim) and anxiety tasks (elevated plus maze as juvenile and adults) had no treatment differences. Perinatal exposed mice had a 15 to 25% increase in separation vocalization (p<0.04) and an increase in male aggression (p<0.03).

CONCLUSION: Prenatal exposure to a therapeutic dose of Paxil impact on selected behavioral tasks in developing mice offspring was an increase in anxiety as infants and male aggression as adults.

Supported by John W. Records Perinatal Research Fund.
189 THE INSULIN PUMP DURING PREGNANCY IN WOMEN WITH INSULIN-DEPENDENT DIABETES MELLITUS: A FRIEND OR FOE?
S.S. McElvy\textsuperscript{a}, M. Miodovnik, B.M. Rosen, J.C. Khoury\textsuperscript{a}, T.A. Siddiqi. Division of Maternal Fetal Medicine, Dept. Ob/Gyn, Univ. of Cincinnati, Cincinnati, OH

OBJECTIVE: This study was undertaken to determine whether the use of an insulin pump in pregnant women with insulin-dependent diabetes mellitus (IDDM) is associated with improved glycemic control and pregnancy outcome.

STUDY DESIGN: All women from the diabetes in pregnancy trial at the University of Cincinnati (1978-1993) managed with insulin pump therapy were identified and matched to a control group (1:2 ratio). Matching criteria were: Age of diagnosis, duration of disease and microvascular complications.

RESULTS: Twenty-four women using insulin pump were matched with 48 women treated with conventional insulin therapy. Patient characteristics, measures of glycemic control and pregnancy outcome are presented in the following table.

<table>
<thead>
<tr>
<th>Pump users (n=24)</th>
<th>Conventional (n=48)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HbA1c (%)</td>
<td></td>
</tr>
<tr>
<td>Trimester 1</td>
<td>9.2±1.8</td>
</tr>
<tr>
<td>Trimester 2</td>
<td>7.7±1.5</td>
</tr>
<tr>
<td>Trimester 3</td>
<td>7.4±0.9</td>
</tr>
<tr>
<td>Glucose (mg/dl)</td>
<td></td>
</tr>
<tr>
<td>Trimester 1</td>
<td>122±26</td>
</tr>
<tr>
<td>Trimester 2</td>
<td>116±22</td>
</tr>
<tr>
<td>Trimester 3</td>
<td>100±22</td>
</tr>
<tr>
<td>Pre-eclampsia</td>
<td>4 (17)</td>
</tr>
<tr>
<td>Preterm delivery &lt; 37 wks</td>
<td>4 (20)</td>
</tr>
<tr>
<td>Cephalic delivery &lt; 34 wks</td>
<td>1 (5)</td>
</tr>
<tr>
<td>Cesarean section</td>
<td>15 (75)</td>
</tr>
<tr>
<td>Gest at delivery (wks)</td>
<td>37.4±1.8</td>
</tr>
<tr>
<td>Birthweight (g)</td>
<td>3400±571</td>
</tr>
<tr>
<td>LGA</td>
<td>5 (28)</td>
</tr>
<tr>
<td>RDS</td>
<td>1 (5)</td>
</tr>
<tr>
<td>Neonatal hypoglycemia</td>
<td>4 (21)</td>
</tr>
</tbody>
</table>

Data presented as n(%) or means±SD HbA1c normal values 5.5±8.3%.
None of these differences were statistically significant.

CONCLUSIONS: Although insulin pump therapy appears to offer an advantage in maternal glycemic control and pregnancy outcome, more patients are needed to establish these benefits and reach statistical significance.

190 VAGINAL BIRTH AFTER CESAREAN SECTION (VBAC) IN THE DIABETIC GRAVIDA. J. Michaelson\textsuperscript{a}, S.C. Blackwell\textsuperscript{a}, S.S. Hassan\textsuperscript{a}, S.M. Berry, Y. Sorokin, R. Wolfe. Division of Maternal Fetal Medicine, Dept. Ob/Gyn, Hutzel Hospital/Wayne State University, Detroit, MI

OBJECTIVE: The purpose of this study was to identify predictive factors and odds of successful VBAC in the diabetic gravida.

STUDY DESIGN: A perinatal database was used to identify patients with pregnancies complicated by diabetes (A-F) delivered at ≥ 37 weeks over a seven-year period (1991-1997). Pertinent clinical information was obtained from chart review.

RESULTS: 177 diabetic pregnancies were analyzed: White Class A-2 (n=77), B (n=53), C (n=53), D (n=8), E (n=4), F (n=2). The cesarean section (CS) rate for patients without a prior CS was 28.8% (40/139). There were 38 patients (21.5%) with a prior CS. These patients had a CS rate of 60.5% (23/38).

<table>
<thead>
<tr>
<th>Variable</th>
<th>CS Rate (%)</th>
<th>Odds Ratio for CS</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class A\textsuperscript{a}, no prior CS (n=65)</td>
<td>18.5</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Class A\textsuperscript{a}, prior CS (n=12)</td>
<td>41.6</td>
<td>3.2</td>
<td>0.9-11.7</td>
</tr>
<tr>
<td>Class B, no prior CS (n=74)</td>
<td>37.8</td>
<td>2.7</td>
<td>1.2-5.9</td>
</tr>
<tr>
<td>Class B, prior CS (n=26)</td>
<td>69.0</td>
<td>9.9</td>
<td>3.5-28.2</td>
</tr>
</tbody>
</table>

The major indication for CS in the VBAC patient was a labor abnormality (80%). There was no correlation between the likelihood of successful VBAC and modified bishop score, labor induction, birth weight, or parity.

CONCLUSIONS: VBAC rates in pregestational diabetes are significantly lower than those quoted for non-diabetic gravidas. Vaginal delivery could not be accurately predicted in the ante or early intrapartum period on the basis of factors commonly associated with successful VBAC in the non-diabetic gravida.
POSTER SESSION II

Thursday, January 21, 1999
3:30 pm - 5:30 pm

Yosemite and Franciscan Rooms

CATEGORIES
Clinical Obstetrics
Infectious Disease
Intrapartum Fetal Evaluation

Poster Numbers
192-306

Judges: Thomas J. Benedetti, MD
Richard K. Silver, MD
Joseph A. Spinnato, MD
192


OBJECTIVE: The 1994 NIH Consensus Development Conference report acknowledges and our review of available English language literature reveals that, no studies have evaluated the effectiveness of antenatal steroids (AS) in the clinical setting of antepartum placenta previa (PP) and abruptio placenta (AP) in spite of early warning and time for administration of AS. The purpose of this study was to determine the effectiveness of AS in the clinical setting of antepartum hemorrhage (APH).

STUDY DESIGN: Consecutive neonates weighing $1750$ delivered by women with APH between January, 1990 and July 1997 were entered into the study. Neonates born following APH, PP and AP were stratified according to AS exposure and compared for RDS, intraventricular hemorrhage (IVH) and preterm necrotizing enterocolitis (PVL), major brain lesions (MBL), grades 3 and 4 IVH, IVH/PVL, NEC, PDA, neonatal sepsis (NS) and neonatal death (ND). The groups were also compared for gestational age (GA), birth weight (BW), birth weight percentile (BW%), Appar scores (APS), postnatal surfactant exposure (PSE), clinical (CA) and histologic chorioamnionitis (HCA). Student T-test, chi-square and Fisher exact tests were used for analysis.

RESULTS: A total of 122 neonates weighing 1750 grams or less were delivered of mothers with antepartum hemorrhage during this period. There were no differences between groups with regards to GA, BW, BW%, APS, PSE, PDA, NEC, NS, CA and HCA. A comparison of groups with regards to major neonatal outcomes follows:

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>APH</th>
<th>Placenta Previa</th>
<th>Abruptio Placenta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index</td>
<td>+AS</td>
<td>+AS</td>
<td>P</td>
</tr>
<tr>
<td>N</td>
<td>31</td>
<td>31</td>
<td>13</td>
</tr>
<tr>
<td>RDS</td>
<td>39</td>
<td>57</td>
<td>31</td>
</tr>
<tr>
<td>IVH/PVL (%)</td>
<td>13</td>
<td>13</td>
<td>.02</td>
</tr>
<tr>
<td>MBL (%)</td>
<td>3</td>
<td>19</td>
<td>.04</td>
</tr>
<tr>
<td>ND (%)</td>
<td>3</td>
<td>14</td>
<td>.11</td>
</tr>
</tbody>
</table>

CONCLUSIONS: Antenatal steroids significantly decrease the incidence of RDS and IVH/PVL in the presence of symptomatic placenta previa but appears to have no such impact in the presence of abrupt placental rupture.

193


OBJECTIVE: To compare perinatal outcomes of triplet pregnancies conceived spontaneously with those conceived by IVF.

STUDY DESIGN: All triplet pregnancies carried and delivered at Westchester Medical Center between January 1990 and July 1997 were entered into this study. The spontaneous triplet group was compared to the IVF triplet group for maternal and perinatal outcome variables. Descriptive statistics, Student T-test, and Chi-square and Fisher exact tests were used for analysis.

RESULTS: A total of 122 neonates weighing $1750$ grams or less were delivered of mothers with antepartum hemorrhage during this period. There were no differences between groups with regards to GA, BW, BW%, APS, PSE, PDA, NEC, NS, CA and HCA. A comparison of groups with regards to major neonatal outcomes follows:

CONCLUSIONS: Perinatal outcomes are comparable between spontaneously conceived and IVF triplet pregnancies. The finding of increased incidence of intraventricular hemorrhage and periventricular leukomalacia in the IVF group deserves further investigation.

194


OBJECTIVE: To determine the impact of histologic chorioamnionitis (HCA) on perinatal outcomes.

STUDY DESIGN: Consecutive neonates weighing $1750$ delivered between Jan. 1990 and Dec. 1997 were entered into the study. Cases of clinical chorioamnionitis were excluded. The total population was stratified according to the presence of HCA and compared for RDS, intraventricular hemorrhage (IVH) and periventricular leukomalacia (PVL), major brain lesions (MBL), grades 3 and 4 IVH, IVH/PVL, NEC, PDA, neonatal sepsis (NS) and neonatal death (ND). The groups were also compared for gestational age (GA), birth weight (BW), birth weight percentile (BW%), Appar scores (APS), postnatal surfactant exposure (PSE), clinical (CA) and histologic chorioamnionitis (HCA). Student T-test, chi-square and Fisher exact tests were used for analysis.

RESULTS: A total of 122 neonates weighed $1750$ delivered during the study period.

CONCLUSIONS: Antenatal steroids significantly decrease the incidence of RDS and IVH/PVL in the presence of symptomatic placenta previa but appears to have no such impact in the presence of abrupt placental rupture.

195


OBJECTIVE: To identify if any association exists between the interleukin-1 receptor antagonist (IL-1RN) gene polymorphism and recurrent pregnancy loss.

STUDY DESIGN: The frequencies of the IL-1RN alleles were determined in a population of women and their partners who had had no previous live births and at least 3 miscarriages. As a control population, women attending the antenatal unit with no history of miscarriage and having 3 or more normal live deliveries were recruited as controls.

RESULTS: Table 1: showing the distribution of IL-1RN genotypes in women suffering recurrent miscarriage.

<table>
<thead>
<tr>
<th>IL-1RN genotype</th>
<th>1</th>
<th>1</th>
<th>1.5</th>
<th>1.4</th>
<th>2</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affected Women</td>
<td>86</td>
<td>23</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>118</td>
</tr>
<tr>
<td>Control</td>
<td>35</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>42</td>
</tr>
</tbody>
</table>

$\chi^2=0.5$, p is not significant

Table 2: showing the distribution of IL-1RN genotypes in the partners of women suffering recurrent miscarriage.

<table>
<thead>
<tr>
<th>IL-1RN genotype</th>
<th>1</th>
<th>1</th>
<th>1.5</th>
<th>1.4</th>
<th>2</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affected women</td>
<td>47</td>
<td>14</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>66</td>
</tr>
<tr>
<td>Control partners</td>
<td>22</td>
<td>7</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>31</td>
</tr>
</tbody>
</table>

$\chi^2=0.4$, p is not significant

CONCLUSION: Carriage of the IL-1RN*2 allele which is associated with differential production in autoimmune diseases, is not increased in frequency in those couples most likely to suffer recurrent miscarriage.
**NUCLEATED RED BLOOD CELL (NRBC) COUNT AS A PREDICTOR OF PERINATAL OUTCOME IN INFANTS ADMITTED TO THE NEONATAL INTENSIVE CARE UNIT (NICU), Minor VR, Shatzkin EZ, Dixon MY. Deps. of Ob/Gyn and Neonatology, Albert Einstein College of Medicine, Lenox Hill Hospital and Long Island Jewish Medical Center, NY.**

**OBJECTIVE:** We have previously demonstrated that elevated NRBC counts are associated with adverse perinatal outcome in the growth restricted fetus. Others have shown that elevated neonatal NRBC counts are linked with long term neurologic impairment. In the present study, we sought to examine NRBC count as a predictor of perinatal outcome in infants admitted to the NICU.

**METHODS:** All admissions to the NICU during 1997 were reviewed prospectively for perinatal outcome. Non-anomalous, genetically normal, infants born neonates with a CBC drawn within the first 4 hours of life were included. Various predictors of neonatal outcome were examined including gestational age at birth (GA), birthweight, 5 minute Apgar score, umbilical cord arterial pH (A pH) and base excess (A BE) as well as NRBC count at birth. Stepwise regression was used for statistical analysis.

**RESULTS:** 324 infants were admitted to the NICU in 1997. Of these, 222 met the inclusion criteria. We found that neonatal death (n=4) was independently predicted by elevated NRBC count (R^2=0.36, p=0.0001), large A BE (R^2=0.39, p=0.0001) and immature GA (R^2=0.43, p=0.0001). Stay in the NICU >10 days, neonatal intraventricular hemorrhage and hyperbilirubinemia were predicted only by immature GA (R^2=0.34, p=0.0001; R^2=0.17; p=0.0001 and R^2=0.13, p=0.0002, respectively). Elevated NRBC count and immature GA independently predicted use of mechanical ventilation (R^2=0.19, p=0.0001 and R^2=0.14, p=0.0001, respectively) and use of surfactant (R^2=0.15, p=0.0001 and R^2=0.19, p=0.0001, respectively). Only high NRBC count significantly predicted neonatal hypoglycemia and the need for blood pressure support agents (R^2=0.06, p=0.03 and R^2=0.16, p=0.0001, respectively). Neonatal seizure activity (n=5) was not predicted by any of these factors.

**CONCLUSION:** Our results indicate that in addition to gestational age and abnormal cord gases, NRBC count at birth is an important, independent predictor of several adverse perinatal outcomes.

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**A REGISTRY STUDY OF IVF BIRTHS IN SWEDEN 1982-1995: C-B Wennemo et al, and all IVF clinics in Sweden in collaboration with the Swedish Medical Board of Health and Welfare, Center for Epidemiological Studies. Perinatal Center, Dept Ob Gyn, Sahlgrenska University Hospital, Östra, Göteborg, Sweden.**

**OBJECTIVE:** To analyze the perinatal outcome of the complete Swedish IVF birth cohort in comparison with a population based control group.

**STUDY DESIGN:** In a retrospective registry study with data collected from all IVF clinics in Sweden, the perinatal outcome of all infants (n = 856) born after IVF 1982-1995 have been compared with a complete cohort of infants born after natural conception (n = 1 059 724) using data from the Swedish Medical Birth Registry (SMBR), the Registry of Congenital Malformations and the Cancer Registry. Data was also analyzed after stratification for maternal age, parity, previous stillbirth, year of birth and multiple pregnancy. Relative risk (RR) with 95% confidence interval (CI) was calculated.

**RESULTS:** In the IVF group, 42 deliveries (0.9%) were lost to follow-up. Multiple birth occurred in 27% in the IVF study group compared with 1% in the control group. Preterm birth (<37 weeks) occurred in 30% and 6%, and low birthweight (<2500g) in 27% and 5%, in the IVF study group and the control group, respectively. The mortality was 1.9% in the IVF group and 1.1% in the control group. For IVF singletons, the RR (95% CI) of extreme preterm birth (<32 weeks) was 3.5 (2.9-4.3). After stratification for maternal age, parity, and previous stillbirth the RR (95% CI) of reduced to 1.5 (1.1-2.0). Malformations occurred in 5.4% of all IVF infants (RR 1.39, 95% CI 1.21-1.54). In the IVF group, an increased incidence of neural tube defects and esophageal atresia was found.

**CONCLUSIONS:** Of the patients with an IVF there was considerably higher risk of being born preterm and with a low birthweight than other children. The rate of malformations was increased with 39%. A high incidence of multiple birth and maternal characteristics were the main factors responsible for the adverse outcome.

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**SECOND TRIMESTER PREGNANCY LOSS. CW Brinis, ET Vostrovsky, AM Vintzileos, D Day-Salvatore, S Trout, S Shen-Schwarz, W Lin, UM-John Wood Johnson Medical School/St. Peter's Medical Center, New Brunswick, NJ.**

**OBJECTIVE:** To identify possible causes of second trimester loss in patients referred to a multidisciplinary Pregnancy Loss Evaluation Service (PLES). At our institution second trimester losses were evaluated. Second trimester loss was defined as loss between 14 and 24 weeks gestation. All patients were evaluated by: history, physical, pathological, autoimmune antibody (ANA, AS, APL, lupus anticoagulant), TSH, prolactin, diagnostic hysteroscopy/hystero-salpingogram and placental pathology and/or autopsy from previous losses if available. All placental/autopsy specimens available were reviewed by a single perinatal pathologist. Case studies for each patient were then assembled and discussed in a multidisciplinary setting including maternal fetal medicine specialist, geneticist, perinatal pathologist, reproductive endocrinologist and rheumatologist. Pregnancy losses were then categorized into the following groups based on suspected primary etiologies: genetic, immunopathological, infection related (viral, bacterial), placental pathology and/or unknown. Immunopathological findings categorized as IAI CIAI incompetence were not ruled out because of difficulty in distinguishing the initiating event. Each pregnancy loss was analyzed as an individual event. Immunopathology losses were categorized based on the presence of greater than two lesions of the chronic inflammatory type, decidua vascular type or coagulation related lesions. Genetic losses were categorized based on the presence of cytogenetics, multiple congenital anomalies or dysmorphology.

**RESULTS:** A total of 45 patients with 59 second trimester losses were evaluated. All maternal karyotypes were normal. Paternal karyotypes were abnormal in 20 patients: 2 with inversion of chromosome 9 (normal variant associated with loss) and 1-mosaicism for Rhinofelter's syndrome. A positive ANA was found in 18 patients. All patients had negative antiphospholipid IgG and Lupus anticoagulant using the Bn: crossmatch and protamine neutralization test for lupus anticoagulant. None of the patients had uterine abnormalities. Patient in the group studied had more than 2 second trimester losses.

**CONCLUSIONS:** The classification of losses according to the PLES service is as follows: Infectious 23 (39%), Immunopathological 18 (30%), Genetic 13 (22%), Idiopathic 3 (5%), Uterine abnormalities 2 (4%).

**ANTIPHOSPHOLIPID ANTIBODIES AND PLACENTAL Histology IN SECOND TRIMESTER PREGNANCY LOSS. CW Brinis, ET Vostrovsky, AM Vintzileos, D Day-Salvatore, S Trout, S Shen-Schwarz, W Lin, UM-John Wood Johnson Medical School/St. Peter's Medical Center, New Brunswick, NJ.**

**OBJECTIVE:** To determine if a correlation exists between antiphospholipid antibodies and placental pathology in second trimester pregnancy loss.

**STUDY DESIGN:** Patients presenting to the Pregnancy Loss Evaluation Service (PLES) with second trimester pregnancy loss (n = 45) were evaluated in a multi disciplinary group setting by Maternal fetal medicine specialist, geneticist, perinatal pathologist, reproductive endocrinologist and rheumatologist. Second trimester losses were defined as loss between 14 and 24 weeks gestation. All patients were evaluated by: history, physical, pathological, antiphospholipid antibody panel, parental karyotypes, diagnostic hysteroscopy/hystero-salpingogram and placental pathology and/or autopsy from previous losses if available. The antiphospholipid antibody panel included an ANA, DnDNA, Anticardiolipin IgG and IgM and Lupus anticoagulant. All placental and autopsy specimens available were reviewed by a single perinatal pathologist. Placental histology was evaluated for evidence of infection (acute and chronic), chronic inflammatory lesions, decidua vascular lesions and coagulation related lesions. Pregnancy losses were then categorized into the following groups based on suspected primary etiologies: genetic, immunopathological, infectious, vascular lesions or coagulation related lesions. Each pregnancy loss was analyzed as an individual event. Immunopathology losses were categorized as greater than 2 lesions of the chronic inflammatory type, decidua vascular lesions and coagulation related lesions. Genetic losses were categorized based on cytogenetics, multiple anomalies or dysmorphology. Environmental losses were categorized by history of medication exposure. Hormonal losses were categorized by history of medical treatment.

**RESULTS:** A total of 59 second trimester losses (45 patients) were seen. A positive ANA was found in 18 patients with a range of 8.9 to 15. No significant differences were found between the positive ANA and negative ANA group in terms of pregnancy loss, or placental histology (infection or chronic inflammatory lesions, decidua vascular lesions or coagulation related lesions). All patients had negative DnDNA, anticardiolipin IgG and IgM and Lupus anticoagulant. No differences were found between the categories of pregnancy loss based on the evaluation of the PLES group (infectious, genetic, immunopathological, uterine anomaly, hormonal, environmental or unknown) or antiphospholipid antibody. No patient in the group studied had more than 2 second trimester losses.

**CONCLUSIONS:** In this group of patients presenting to a tertiary care center antiphospholipid antibodies did not appear to be associated with abnormal placental histology. When losses were categorized according to the PLES group no loss type was associated with antiphospholipid antibodies.
200 LACK OF PRENATAL CARE IS ASSOCIATED WITH INCREASED PERINATAL MORBIDITY IN UNPLANNED HOME DELIVERIES. U. Magneps, H.C. Moscosia, M. Kriessenb, J.A. Copell. Dept. OB/GYN, Emergency Medicine, Yale Univ., New Haven, CT.

OBJECTIVE: To evaluate factors contributing to poor outcome in unplanned out-of-hospital deliveries.

STUDY DESIGN: Retrospective cohort study of 91 field deliveries during a three-year period.

RESULTS: Sixty-eight women received prenatal care, 29.7% by private physicians (group 1), 45.1% by resident physicians in the university clinic (group 2). Twenty-three mothers, (25.2%), had no prenatal care (group 3). Fifty-six percent of group 2 had prenatal care in a previous pregnancy, including 12% with no prenatal care. Eighty-three percent of group 3 had a history of poor prenatal care in a previous pregnancy, including 44% with no prenatal care. Smoking, alcohol and drug use were least prevalent in group 1 (p<0.01) compared with groups 2 and 3, which were both greater than 50%. There was a significant difference in mean number of prenatal visits between groups 1 and 2 (11.9 and 4.3, p<0.01). Prenatal care in either private or university clinic settings was associated with higher neonatal weight and Dubowitz score (p<0.01) compared with patients without prenatal care. Neonatal ICU days and hospital stay were greatest in patients with no prenatal care. There was significantly higher infant mortality in patients without prenatal care (p<0.01), 6 from extreme prematurity, one 33 week infant and one full-term. There was one death in group 2 and none in group 1.

CONCLUSIONS: Among women delivering outside the hospital, a history of no prenatal care identifies those at risk for adverse neonatal outcome. Despite similar socioeconomic risk factors for poor outcome in groups 2 and 3, women without prenatal care had significantly worse neonatal outcome in unplanned home deliveries. Programs designed to reduce perinatal mortality need to target women with a history of poor prenatal care and home deliveries.

201 NATURAL HISTORY OF SUBSEQUENT PREGNANCIES IN WOMEN WITH PRIOR FETAL DEATH (FD). Luikenaar RAO, Lee RPM, Branch DW, Scott JRJ, Porter TF, Silver RM. Dept OB/GYN, Univ of Utah, SLC, UT.

OBJECTIVE: Patients with recurrent first trimester spontaneous abortion have been the subject of intensive investigation. However, relatively little is known about mid-trimester pregnancy loss. Thus, it is difficult for clinicians to optimally counsel, evaluate, and manage women with previous unexplained fetal death. Our objectives were to ascertain the natural history of subsequent pregnancies in patients with prior fetal death and to identify risk factors that may influence ensuing pregnancy outcome.

METHODS: Subjects were identified from patients referred for evaluation of fetal death and having at least one subsequent pregnancy between 1986 and 1997. Medical and obstetric histories were obtained by telephone interview and the medical records. All patients were tested for lupus anticoagulant and anticardiolipin antibodies and those with positive tests were excluded. Logistic regression models were used to identify characteristics predictive of subsequent pregnancy outcome.

RESULTS: 205 subjects met inclusion criteria. Up through the time of their first fetal death, these women had 604 pregnancies resulting in 210 (35%) live births, 189 (31%) spontaneous abortions, and 205 (34%) fetal deaths. The 205 pregnancies immediately following the first fetal death resulted in 53 (25%) live births, 85 (41%) spontaneous abortions, and 62 (30%) recurrent fetal deaths. In total, these women had 750 subsequent pregnancies resulting in 212 (29%) live births, 313 (42%) spontaneous abortions, and 217 (28%) fetal deaths. Over two-thirds of fetal deaths occurred during the second trimester with the median between 15 to 16 weeks. Surprisingly, maternal age, number of pregnancy losses, timing of fetal death, and prior live birth were all unrelated to subsequent pregnancy outcome. A cause of fetal death was identified in only 20 (9%) subsequent fetal deaths.

CONCLUSIONS: Women with prior fetal death are at high risk for subsequent pregnancy loss with less than 30% of pregnancies resulting in surviving infants. Traditional risk factors for recurrent spontaneous abortion do not appear to influence pregnancy outcome in this group of patients. These data underscore the need for additional research into the pathophysiology and prevention of recurrent fetal death.

202 MODIFIABLE OBSTETRIC CARE FACTORS ASSOCIATED WITH INFANT MORTALITY. C. Kline, D. H. Watts, J. Krigeer. Dept. OB/Gyn and Medicine, Univ. of WA and Seattle-King County Dept. of Public Health (DPH), Seattle WA.

OBJECTIVE: To identify modifiable obstetric care factors contributing to infant mortality (IM).

STUDY DESIGN: Retrospective review of infant deaths between 1994-97 using birth and death certificates, obstetric, pediatric and autopsy records, maternal interviews and case-by-case review by physicians, epidemiologist and DPH staff. All live born infants who were born and died before one year in King County were eligible.

RESULTS: Of 262 eligible deaths, 247 (94%) were reviewed. IM declined by 50% between 1988 and 1994 with a concomitant reduction in maternal smoking (21% to 13%), alcohol use (7% to 4%) and inadequate prenatal care (PNC) (14% to 10%). Causes of death (COD) included perinatal conditions (e.g. asphyxia and infection) (24%), congenital anomalies (25%), Sudden Infant Death Syndrome (SIDS) (22%), and prematurity (15%).

Modifiable obstetric care factors which significantly contributed to infant death were identified in 16% (39/247) of cases. Cases often had multiple factors identified including inadequacies in intrapartum fetal assessment (n=15), pediatric care at delivery (n=15), labor management (n=11) maternal transport (n=6) and genetic counseling (n=5).

CONCLUSIONS: Modifiable obstetric care factors which contributed to infant mortality were identified in only 16% of cases. Inappropriate obstetric and pediatric management on labor and delivery, delayed intrapartum fetal assessment, and inadequate genetic counseling were among the factors identified. Regional and institutional quality assurance programs should address these factors.

203 RACE AND NEONATAL ILLNESS SEVERITY. S. Berman, D. E. Richardson, A. Cohen, E. Lieberman. Dept. OB/Gyn, Brigham and Women’s Hospital, Boston, MA.

OBJECTIVE: To determine whether there are racial differences in the neonatal illness severity score independent of gestational age.

STUDY DESIGN: The study population consisted of all singleton infants with gestational ages less than 34 weeks admitted to the NICU at the Brigham and Women’s Hospital between December 1994 and November 1995. Maternal and neonatal data were obtained by chart review. Illness severity was measured using a neonatal severity of illness score, the SNAP score.

RESULTS: Of 262 eligible deaths, 247 (94%) were reviewed. IM declined by 50% between 1988 and 1994 with a concomitant reduction in maternal smoking (21% to 13%), alcohol use (7% to 4%) and inadequate prenatal care (PNC) (14% to 10%). Causes of death (COD) included perinatal conditions (e.g. asphyxia and infection) (24%), congenital anomalies (25%), Sudden Infant Death Syndrome (SIDS) (22%), and prematurity (15%).

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CONCLUSIONS: Women with prior fetal death are at high risk for subsequent pregnancy loss with less than 30% of pregnancies resulting in surviving infants. Traditional risk factors for recurrent spontaneous abortion do not appear to influence pregnancy outcome in this group of patients. These data underscore the need for additional research into the pathophysiology and prevention of recurrent fetal death.
PREGNANCY OUTCOME IN PATIENTS TREATED FOR MALIGNANT OVARIAN GERM CELL TUMORS (MOGCT). M.G. Canuti, A. Locatelli, C. Bononi, P. Verzeletti, Department of Ob/Gyn, University of Milan, ISBM San Gerardo, Monza, Italy.

OBJECTIVE: To evaluate the reproductive outcome of patients with MOGCT treated with fertility-sparing surgery (FSS). STUDY DESIGN: Between 1/82 and 12/96, 169 consecutive patients with MOGCT were treated at our Institution, including 70 cases of dysgerminoma, 28 of endodermal sinus tumor, 24 of mixed germ-cell tumors, and 47 of immature teratoma. 98 cases had tumors in stage I, 14 in stage II, 46 in stage III, 5 in stage IV, and 6 had recurrences. FSS was performed in 158/169 (92%) cases.

RESULTS: Median maternal age was 21 years (range 8-41). Chemotherapy (CH) was administered to 73/138 (53%) women with advanced or high risk disease. Survival rate was 98% (135/138) at a median follow-up of 67 months (range 8-130). Of surviving patients, 7 (5%) were infertile (5 for demoliective surgery during follow-up, 1 for early menopause, and 1 for primary amenorrhea). Of the 128 potentially fertile patients, 32 attempted conception (20 treated with CH, 12 untreated) for a total of 55 conceptions.

Pregnancy outcome | Treated with CH | Untreated | P value
--- | --- | --- | ---
Term pregnancy | 26 (68%) | 12 (86%) | 0.1
Voluntary termination | 4 (10%) | 2 (14%) | 0.5
Miscarriage | 9 (21%) | 0 (0%) | 0.05
Malformations | 3/32 (9%) | 1/14 (7%) | 0.6

CONCLUSIONS: In patients with MOGCT desirous of fertility, conservative treatment can be a viable approach. While the overall miscarriage rate in the study population (16%) is not different from that of the general population, the high rate of major malformations (4/46 or 9%) requires further investigation.

EFFECTS OF HEPATITIS C VIRUS INFECTION ON PREGNANCY OUTCOME. P. Bellini, N. Roncalli, A. Locatelli, A. Arreghin, L. Patane, A. Ghidini. Dpt. of Ob/Gyn, University of Milan, ISBM San Gerardo, Monza, Italy; and Georgetown University Medical Center, Washington, D.C.

OBJECTIVE: To establish the effects of hepatitis C virus (HCV) infection on maternal and perinatal outcomes.

STUDY DESIGN: From January 1992 to December 1996, 44/169 women with proven HCV infection underwent serologic screening for HCV (enzyme-linked immunosorbent assay confirmed by recombinant immunoblot assay). Positive cases were tested by polymerase chain reaction for HCV-RNA. HBeAg was tested in all women, HIV in high risk population. Monthly serum liver function tests were evaluated in HCV positive patients. Statistical analysis included chi-square and t-test, with significance at P<0.05 or 95% confidence interval (CI) not inclusive of the unity.

RESULTS: 73/16,271 pregnant women (0.4%) were HCV positive. Median maternal age was 39 years (range 18-44). No difference were present between mean ±SD levels before vs during pregnancy or sGPT, sGOT (p=0.9), or GGT (p=0.7), while bilirubin increased significantly during pregnancy (0.4±0.1 vs 0.6±0.6 mg/dl, p<0.05). The incidence of intrahepatic cholestasis of pregnancy (15/73 (20%) vs 145/16271 (0.9%), relative risk (RR) 25.2, 95% CI 13.5-47.1) and the rate of preterm delivery at <37 wks [16/73 (22%) vs 146/16271 (9%), RR 2.4, 95% CI 1.5-3.7] were significant higher than in the general pregnant population. Median gestational age at delivery (39 wks), birth weight (3110 g), and cesarean section rate (14%) among HCV positive women were similar to those of the general pregnant population.

CONCLUSIONS: Fatigue during pregnancy, from both home and work, contributes significantly to antenatal morbidity (ER, labor and delivery visits, or hospitalization) among employed women.

WORK & PREGNANCY: ROLE OF FATIGUE ON ANTENATAL HOSPITALIZATIONS. B Luke, M Ami, L Min. Department of Obstetrics & Gynecology, University of Michigan Medical School, Ann Arbor, MI.

OBJECTIVE: To evaluate factors at home and work associated with antenatal hospitalizations among employed women.

STUDY DESIGN: This is a prospective study of 215 women who were employed during pregnancy. Each woman was interviewed four times (at about 16 wks, 24 wks, 30 wks, and by 12 wks postpartum) about home and work factors, fatigue, and hospitalizations (including ER and labor and delivery visits). A work score was formulated from four factors (standing >4 hrs/day, physical exertion, mental stress, and environment), totaling 0-4 from reported data at each of the three antenatal interviews. A home score was formulated from four factors (laundry, housework, grocery shopping, and washer/dryer in basement), totaling 0-4 from reported data at each of the three antenatal interviews. The risk of any hospitalizations was modeled using logistic regression.

RESULTS: The study population was 88% white, 90% were college-educated, 82% had household incomes >$40,000/yr, and 90% worked until delivery. By 24 wks, 18% had decreased and 17% had increased their work hrs; by 30 wks, 29% had decreased and 16% had increased their work hrs. Analyses were conducted based on women who worked at least 20 hr/wk until delivery (N=192). With advancing gestation, the risk of hospitalizations increased with fatigue (odds ratio, OR, 0.66, 95% CI, 0.44, 1.07 at 16 wks; 1.19, 95% CI, 0.76, 1.86 at 24 wks; 2.90, 95% CI, 1.35, 3.57 at 30 wks).

CONCLUSIONS: Fatigue during pregnancy, from both home and work factors, contributes significantly to antenatal morbidity (ER, labor and delivery visits, or hospitalizations) among employed women.
208 DOES ELEVATED hCG HAVE CLINICAL UTILITY AS A PREDICTOR OF ADVERSE PREGNANCY OUTCOME? D. Walton, C. Norcini*, E. Schoen*, C. Colby*, Kaiser Permanente Northern California, Oakland CA
OBJECTIVE: To define the risk of adverse pregnancy outcomes relative to a range of hCG values in a large HMO population for which outcome information is readily available from a computerized database.

STUDY DESIGN: Second trimester maternal serum hCG values were reviewed for 31,182 singleton pregnancies. Patients with preexisting risk factors were excluded from analysis. Pregnancy outcomes were analyzed for the following: stillbirth rate, intrauterine growth restriction (IUGR), pregnancy induced hypertension (PIH), preterm birth (PB), preterm membrane rupture (PROM) and placental complications (PC).

RESULTS: Outcomes were available in 96% of patients. 2662 had an hCG > 2.0. There was no association between elevated hCG and IUGR or PROM. There was a linear association between hCG and stillbirth. However, a relative risk of 2 was not reached until an hCG of 2.86 MOM. Non caucasian race was 2 times better than the highest hCG level for predicting stillbirth. For the other complications the odds ratios were as follows: PB = 1.19, PIH > 2.0. There was no association between elevated hCG and IUGR or PROM. It remains to be determined at what hCG level intervention should be initiated.

209 KNOWLEDGE AND PRECONCEPTIONAL USE OF FOLIC ACID IN PATIENTS PRESENTING FOR HIGH RISK PREGNANCY CARE. J. Perlman.
Phoenix Perinatal Associates, Phoenix and Yuma, AZ

OBJECTIVE: To survey patients presenting for high-risk pregnancy care and to their preconceptional use of folic acid and to evaluate their understanding of its benefits in reducing the occurrence of neural tube defects (NTDs).

STUDY DESIGN: During a 6 month period, 315 patients presenting for office based high-risk pregnancy care were provided a survey (in either Spanish [N=132] or English [N=183]), evaluating their knowledge and use of folic acid. To avoid information bias, only patients responding positively to any association between folic acid and the prevention of NTDs, significantly less differences between Spanish and English speaking groups. Educational efforts in the community have been initiated on the basis of this work.

210 OUTCOME BASED ANALYSIS OF EARLY POSTPARTUM DISCHARGE AT A UNIVERSITY HOSPITAL. R. Bassett*, J. Stanley, F. Coleman, C. Mirabile, W. Rayburn. Dept Obst & Gynecol, Univ Oklahoma, Okla City, Ok

OBJECTIVE: To determine whether institution of an early hospital discharge policy was safe and effective in reducing hospital stay.

STUDY DESIGN: Early discharge was defined as discharge from the hospital either on the first day after vaginal delivery or on the second day after delivery by cesarean section. A "stay over mom" policy was also instituted to allow a mother to remain in the hospital overnight after discharge. This prospective study was divided into three consecutive three-month periods: 1) routine care (n = 576), 2) early discharge (n = 622), and 3) early discharge with "stay over mom" (n = 574). Length of hospital stay and adverse events were reviewed.

RESULTS: As expected, early hospital discharge was more frequent when policies for such were instituted (routine care: 66%; early discharge: 83%; early discharge with "stay over mom": 95%; p < .0001). Primary reasons for delay in hospital discharge were postpartum fever, pre eclampsia, anemia, and wound complications. The incidences of readmissions did not change (0.7%, 0.8%, and 1.0% consecutively; p > 0.52). Cases requiring readmission were most often attributable to endometritis diagnosed more than 48 hours after discharge.

CONCLUSION: A policy of early postpartum discharge is both plausible and safe in a high risk obstetric university setting. Reduced hospital stay is not associated with increased morbidity.


OBJECTIVE: To determine if misoprostol is more effective than oxytocin in preventing postpartum hemorrhage and to establish objective estimates of postpartum blood loss.

STUDY DESIGN: This was a double blind randomized controlled trial which compared 400ug of misoprostol taken orally at the time of delivery with 20iu of oxytocin given as an infusion following delivery of the placenta. The primary outcome measure was postpartum hemorrhage (blood loss >500 ml during the first 24 hours). Blood loss was objectively measured by weighing the blood loss at delivery and for the first 24 hours after delivery. This has not been performed in previous studies. In order to ensure a double blind design each participant received one placebo and one uterotonic agent. Pre and day 2 post delivery hemoglobin (Hb) was also measured.

RESULTS: 265 women consented to participate in the study. Thirty five did not receive study medications because the delivery was by cesarean section. 250 were randomized 115 to each group. Postpartum hemorrhage policy was instituted in 78 (53%) of the misoprostol group and 74 (46%) of the oxytocin group (NS). There were no significant differences in blood loss, rate of postpartum hemorrhage (>500ml or >1000ml) or the need for an additional uterotonic agent between the groups. The mean postpartum blood loss among all women at delivery was 439ml (391-487) and 392ml (311-938) in the first 24 hours post delivery. There was no difference in the Hb change between the two groups (p=0.85). There was a good correlation between the objective blood loss and the change in Hb (r=0.62).

CONCLUSION: Misoprostol is not more effective than oxytocin in preventing postpartum hemorrhage but considering its cost and ease of administration misoprostol may assume an expanded role in preventing postpartum blood loss. Blood loss during normal delivery may be greater than appreciated despite the administration of an oxytocic agent that is a new definition of excessive blood loss at delivery may be required.

OBJECTIVE: Blood loss at delivery is not routinely measured in clinical practice nor has it been objectively measured in clinical trials. Our objective was to determine if a clinical estimate of blood loss at delivery is accurate and clinically worthwhile.

STUDY DESIGN: This study was performed in conjunction with a double blinded randomized controlled trial which compared misoprostol and oxytocin in preventing postpartum bleeding. All women received one uterine agent. Following delivery of the baby a special draped was placed under the women and all blood loss was objectively measured by weight. The accouchere was then asked to clinically estimate the blood loss. Feedback was provided as to the exact blood loss.

RESULTS: Two hundred and thirty women completed the study. The mean blood loss at delivery was 439ml (391487). The mean estimated blood loss was 364ml (335-925) (p=0.0001). Overall, there was a good correlation between the clinical estimate and actual blood loss. However, among 19 women (8.3%) who lost >1000ml, 18 (95%) were clinically underestimated, 14 (74%) were underestimated by greater than 500ml. The accuracy of clinical estimation did not change over time.

CONCLUSION: Clinical estimation of blood loss results in an under appreciation of blood loss at delivery. This is particularly evident when the blood loss exceeds 1000ml.

214 NEUROLOGICAL MANIFESTATION DURING PREGNANCY ASSOCIATED WITH INHERITED THROMBOPHILIA. M. J. Korfteiniz, F. Barley, M. Shenhab, A. Eldor, A. Many, D. Pauzen, E. Levi. Dept. Ob/Gyn, Tel Aviv Sourasky Medical Center, Tel Aviv University, Tel Aviv, Israel.

OBJECTIVE: To determine whether neurological manifestations during pregnancy are associated with inherited thrombophilies.

STUDY DESIGN: 10 patients who had a neurological manifestation during pregnancy were investigated. Initial workup included computed tomography of head, prothrombin time, partial thromboplastin time, fibrinogen levels, aninuclear factor, antithrombin antibodies and lupus anticoagulant, all of which were normal in each patient. Three patients also underwent magnetic resonance imaging which was normal. Thereafter, all patients were tested for Factor V Leiden (FV Leiden), methylene tetrahydrofolate reductase (MTHFR) C677-T, prothrombin G20210A (Factor II20210), protein S (PS), protein C (PC) and antithrombin III (ATIII).

RESULTS: In 8 of 10 patients (80%) an inherited thrombophilia was found.

Neurological manifestation | Thrombophilia found
--- | ---
TIA | Factor II20210 +/-
TIA | ATIII and protein S deficiency
Anisocoria, nystagmus, fainting | FV Leiden +/-
Left facial loss of sensation | Factor II +/-
Severe Headache | FV Leiden +/-
Nistagmus, severe dizziness | FV Leiden +/-
Headache, left hemiparesis | Factor II +/- and FV Leiden +/-
Right hemiparesis | FV Leiden +/-

+/=/, heterozygote; TIAa, transient ischemic attack.

The patients were treated with S.C. low molecular weight (LMW) heparin, 40mg/day throughout pregnancy and the puerperium and showed complete resolution of their neurological manifestations.

CONCLUSIONS: Patients with a neurological manifestation during pregnancy should be tested for thrombophilias and treatment with LMW heparin may be considered for relief and prevention of thrombotic manifestations.


OBJECTIVE: To review maternal morbidity with a placental abruption and fetal death.

STUDY DESIGN: Seventy-two women had a placental abruption and fetal death at ≥29 weeks’ gestation between 1983 and 1996. Our management includes the early use of oxytocin and amniocentesis with anticipated vaginal delivery. Prompt intravenous volume replacement with packed red cells (PRBC) is based on maintaining a maternal hematocrit (HCT) of ≥30 volume% or urine output (UOP) of ≥30 ml/hr.

RESULTS: Fifty-nine women (82%) received 323 PRBC transfusions and 27 women (38%) required one or more procedures for cesarean delivery (CD). Ninety percent of women were managed expectantly. The mean gestational age at delivery was 27.5 ± 4 years (range 22-24 years). Higher rate of preterm delivery was among the women with chorioangioma 66% vs. 10%, p<0.001 with OR 17.33. Pregnancy outcome:

<table>
<thead>
<tr>
<th>Variables</th>
<th>N=126</th>
<th>N=16</th>
<th>P value</th>
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<tr>
<td>Birthweight (Mean±SD)</td>
<td>2080 ± 849</td>
<td>2911 ± 779</td>
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<td>Gestational age (Mean±SD)</td>
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<td>Multiple gestation</td>
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<td>Vaginal delivery</td>
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<td>Pre-eclampsia</td>
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<td>6.6%</td>
<td>NS</td>
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<td>Hemorrhage</td>
<td>16.6%</td>
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<td>Abruption placenta</td>
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<tr>
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<td>16.6%</td>
<td>NS</td>
</tr>
<tr>
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<tr>
<td>Congenital anomalies</td>
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<tr>
<td>Internal mortality</td>
<td>16.6%</td>
<td>3.3%</td>
<td>NS</td>
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CONCLUSIONS: Chorioangioma of the placenta is associated with an increased risk of preterm delivery and lower birthweight.
### 218 A COMPARISON OF SCREENING METHODS FOR SELF-REPORTED DOMESTIC ABUSE BY PREGNANT WOMEN

#### Objective
To compare a standardized self-completed domestic abuse questionnaire in a directed interview for the identification of domestic abuse in pregnant patients.

#### Study Design
All patients receiving their first prenatal visit between March and September 1997 were assessed for self-reported domestic abuse using a standardized domestic abuse questionnaire (ACOG Technical Bulletin #209). This was followed by a directed interview which involved verbal review of the standardized domestic abuse questionnaire. Self-reported domestic abuse was defined as any positive response to the domestic abuse questionnaire or the directed interview. The number of patients with a positive response to the standardized questionnaire, the directed interview, or both, were recorded. The two techniques were compared by the McNemar test. The group demographics including patient age, parity, recreational substance use and tobacco use were evaluated.

#### Results
Among the 224 patients evaluated, the mean ± SD patient age was 24.1 ± 4.9 years, 56% of the patients were parous, 51% reported tobacco use. A total of 36% (n=80) of the patients reported domestic abuse by either method, a positive response was detected by the domestic abuse questionnaire in 39% (n=35) of the patients, by the directed interview in 15% (n=12) of the patients and by both the questionnaire and the directed interview in 8% (n=5) of the patients. The standardized domestic abuse questionnaire identified 85% (n=68) compared with 59% (n=47) by the directed interview (P<0.03). The use of the directed interview in parallel identified an additional 15% (n=12) of patients with domestic abuse.

#### Conclusions
A standardized domestic abuse questionnaire is superior to a directed interview in identifying self-reported domestic abuse in pregnancy. Utilizing both methods in parallel further increases the number of patients identified. The dramatic findings from this study favor the inclusion of these methods in routine prenatal care.

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### 217 PRENATAL SUBSTANCE USE & DECREASED BIRTH WEIGHT: RELATIVE CONTRIBUTIONS OF EACH SUBSTANCE

#### Objective
To clearly define the impact of substance abuse on decreased birth weight on a sample of gravidas using a causal model which adjusts aggressively for maternal characteristics to isolate the effect of each.

#### Study Design
Live born infants of 3,365 African-American mothers enrolled in a large prospective study of alcohol & other drug use in pregnancy over 11 years were examined. The sample included only women with an U/S supported estimate of gestational age. Path analysis was performed on the first of a planned schizophrenic sample of 1413 mothers. Maternal characteristics were maternal age, pre-pregnancy weight, parity, and socio-economic status. Infant gender was also included. The independent variables were drinking frequency as measured by proportion drinking days across pregnancy, smoking and cocaine use. Dependent variables were gestational duration, fetal weight and birth weight.

#### Results
All three substances, i.e., alcohol, smoking and cocaine use, reduced birth weight through decreased gestational duration. Only alcohol and smoking reduced fetal growth.

#### Conclusion
This study perhaps for the first time appropriately apportions reduced birth weight by substance and cause (decreased gestational duration and growth restriction). Controlled for maternal characteristics and substance exposure the effect size of alcohol is nearly two times that of smoking and five times that of cocaine. These findings might inform a more rational approach to low birth weight reduction via reduced substance abuse.

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### 216 RISK FACTORS FOR DOMESTIC VIOLENCE IN PREGNANCY

#### Objective
To determine risk factors associated with domestic violence in a population of pregnant women.

#### Study Design
During a three year period (July 15, 1995 to July 15, 1998), the Abuse Assessment Screen (AAS) was incorporated into routine social service interviews for women receiving prenatal care in our system. The AAS is a validated screening tool which uses 5 directed questions to assess for 1) past or 2) recent (5 year) physical abuse, 3) sexual abuse, 4) physical abuse in the index pregnancy, and 5) fear of the partner.

#### Results
We screened 7,336 women for domestic violence. Of these, 1,262 (17.2%) women reported past physical abuse, 599 (8.2%) recent physical abuse, 171 (2.3%) sexual abuse, and 308 (4.2%) physical abuse during the index pregnancy. Women with past abuse were older (2414 years vs 22±5 years, P<.0001) and more often multiparous (64% vs 52%, P<.001) compared to non-abused women. Women who reported either past physical abuse, recent physical abuse, sexual abuse, or abuse during the index pregnancy were more likely to have been: white (31% vs 16%, P<.001), or to have used tobacco (39% vs 18%, P<.001), alcohol (24% vs 14%, P<.001), or illicit drugs (21% vs 8%, P<.001). Marital status and GA at entry for prenatal care were similar between women who reported abuse and those who did not.

#### Conclusions
In our population of pregnant women, white race, unemployment, lack of a high school education, tobacco use, alcohol use, and illicit drug use were significant risk factors for domestic violence.

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### 219 A PROSPECTIVE EVALUATION OF A DOMESTIC ABUSE SCREENING TOOL

#### Objective
To determine if administration of a screening questionnaire to new patients will improve the identification of patients experiencing domestic abuse.

#### Study Design
Consecutive women presenting to the outpatient clinic at University Medical Center were considered for the study. The Women's Abuse Screening Tool (WAST), a seven question abuse screening questionnaire to new patients was administered and collected prior to patient encounters with resident physicians and compared to physician elicited history. Exclusion criteria were language barrier and lack of intimate relationship.

#### Results
Mean age was 33 ±3.6 years with mean gravidity of 2.8 ± 1.2 and 1.6 ± 0.9, respectively. Racial composition was 5% Asian, 11% African American, 11% Hispanic and 75% white; 51% were single. Twenty-one percent of subjects were in a relationship less than one year in duration. Another 21% were between one and five years, with 57% of relationships lasting five years or more. The WAST was significantly more successful than standard history and physical in eliciting a history of domestic abuse, particularly emotional abuse. The purpose of our study is to determine if administration of a screening questionnaire to new patients will improve the identification of patients experiencing domestic abuse. The number of patients identified by the inclusion of these methods in routine prenatal care.

#### Conclusion
The WAST is significantly more effective as a screen for domestic abuse than standard history and physical.
VIOLENCE AGAINST WOMEN: ANTEPARTUM COMPLICATIONS

We calculated adjusted RR's to control for these factors. In each case the RR substance abuse has previously been associated with TTB, PTL, and PTD, associated with tobacco abuse (RR 4.6, 95% CI 3.3-6.4), alcohol abuse (RR 5.5, 95% CI 1.6-15.7) preterm labor (PTL) (RR 2.3, 95% CI 1.4-4.6) preterm delivery (PTD) (RR 1.7, 95% CI 1.1-2.5). No significant association was seen with hyperemesis, preeclampsia or diabetes. Violence was also associated with tobacco abuse (RR 4.6, 95% CI 3.3-6.4), alcohol abuse (RR 4.1, 95% CI 2.3-7.6) and illicit drug abuse (RR 5.7, 95% CI 3.8-8.5). Since substance abuse has previously been associated with TTB, PTL, and PTD, we calculated adjusted RR's to control for these factors. In each case the RR estimate was attenuated: TTB (RR 2.1, 95% CI 0.6-7.9), PTL (RR 1.8, 95% CI 0.4-4.1), and PTD (RR 1.3, 95% CI 0.8-2.6).

CONCLUSION: Significant associations were noted between violence against women and the antepartum complications TTB, PTL, and PTD. When we controlled for substance abuse, the relative risks decreased. Two possible explanations for these findings may be that substance abuse causes both violence and these outcomes, or an additional variable, e.g. poverty, is associated with substance abuse, violence and these outcomes. We suspect that both may be operational. The relative contribution will need to be investigated with larger samples in a prospective study designed to track causal precedence.

COCAINE ABUSE AND SEVERITY OF PREECLAMPSIA. S. Tripp, J.U. Hibbard. Dept. Ob/Gyn, Univ. of Chicago, Chicago, IL.

OBJECTIVE: We have noted many severely ill preeclamptics (PRE) and eclamptics (ECL) are also cocaine abusers. We wanted to test the hypothesis that cocaine abuse is associated with more severe forms of PRE and eclampsia.

STUDY DESIGN: Case-control: Cases defined as all severe PRE and ECL patients, 1987 to 1996, stringently meeting ACOG criteria for disease and outcome among these women (AMPH, n=774) was compared to that of women with multiple gestations and those who smoked, used alcohol, cocaine or multiple drugs were excluded. Chi-square and relative risk were calculated for categorical variables; t-tests were used for continuous variables.

RESULTS: A significantly higher percentage of AMPH patients received no prenatal care as compared to controls (20.3% vs. 1.3%, p=0.001). Both gestational age at delivery and neonatal birthweight were lower in the AMPH group and the infant length of stay was significantly prolonged (4.0 vs. 2.3 days, p=0.001). Both methamphetamine use during pregnancy increased the risk of maternal and neonatal complications.

STUDY DESIGN: Using successfully linked data from 1992 California maternal hospital discharges and birth certificates, a cohort of women who used methamphetamine was compared with those who did not. Pregnancy outcome among these women (AMPH, n=774) was compared to that of women who did not use methamphetamines (CONTROL, n=562,799). Women with multiple gestations and those who smoked, used alcohol, cocaine or multiple drugs were excluded. Chi-square and relative risk were calculated for categorical variables; t-tests were used for continuous variables.

RESULTS: A significantly higher percentage of AMPH patients received no prenatal care as compared to controls (20.3% vs. 1.3%, p=0.001). Both gestational age at delivery and neonatal birthweight were lower in the AMPH group and the infant length of stay was significantly prolonged (4.0 vs. 2.3 days, p=0.001).
**224 DOCS COCAINE USE WORSEN PERINATAL OUTCOME IN PATIENTS WHO DO NOT RECEIVE PRENATAL CARE?**

**Authors:** R. Andres, E. Pachirre and M. Davidson, Dept of Ob/Gyn, Univ of Texas-Houston, Houston, Texas

**Objective:** To evaluate possible differences in perinatal outcome among women without prenatal care based upon the presence or absence of cocaine dependence.

**Study Design:** Patients delivering at a university-based tertiary center who had received no prenatal care were identified by a computerized search of medical records. These patients were divided into two groups based upon the results of their urine drug screen (negative UDS [NPC] n=182) and UDS positive for cocaine [COC] n=25). Patients receiving regular prenatal care served as the control group [CON] (n=88). Patient's charts were reviewed for numerous outcome measures (preterm birth (PTB), birthweight (BW), etc.). Data were analyzed with ANOVA, Fisher's exact or chi-square test where appropriate. Data presented as mean ±SD with a p-value <0.05 considered significant.

**Results:** The mean GA at birth was greater in the CON grp (38.9) than both the NPC grp (34.4) and COC grp (33.0) (p<0.01). No differences were found between the NPC and COC grp with respect to PTB or GA at delivery. The BW was greater in the CON grp (2680 ± 124) than both the NPC (2812 ± 138) and COC (2459 ± 856 gms) patients. A trend toward a lower mean BW was seen in the COC grp when compared to the NPC grp. The incidence of low BW (<2500 gms) was greater in both the NPC (22%) and COC (40%) grps when compared to the CON (6.8%) grp. No differences were found comparing the mean gestational age at delivery or GA at delivery. The mean gestational age at delivery was greater in the CON grp (38.8) than both the NPC (34.4) and COC grp (33.0) (p<.01). Similarly, the PTB rate was greater in both the NPC (44%) and the COC (52%) grp than CON (6.8%) p<.01. No differences were found between the NPC and COC grp with respect to PTB or GA at delivery.

**Conclusions:** Patients who do not receive prenatal care deliver infants of significantly lower BW and have a greater incidence of PTB and of LBW infants. Among patients with no prenatal care, the use of cocaine was not associated with an overt worsening of perinatal outcome, although a trend toward lower BW was evident among these infants.

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**225 THE NATURAL HISTORY OF TWIN-TWIN TRANSFUSION SYNDROME**

**Authors:** V. Berghella, M. Kaufmann, Division of MFM, Department of Ob/Gyn, Jefferson Medical College of Thomas Jefferson University, Phila, PA

**Objective:** To determine the natural history of twin-twin transfusion syndrome (TTTS) pregnancies.

**Study Design:** All cases of TTTS at our institution since 1991 and in a MEDLINE search since 1966 were retrospectively reviewed. The prenatal diagnosis of TTTS required the presence of monochorial/diamniotic (MC/DA) placental (absence of twin-peak sign, thin membrane, single placenta, and same gender), and of polyhydramnios (largest pocket >8cm) in one sac and oligohydramnios (largest pocket <2cm or stuck twin) in the other. Chorionicity was confirmed by placental pathology, and gender was analyzed prenatally and confirmed postnatally.

**Results:** Thirty-three TTTS pregnancies were identified, of which 23 met the above strict criteria for TTTS. The mean gestational age (GA) at diagnosis was 19.1 weeks (range 15-18). Mean GA at delivery was 29.8 weeks (range 22-41). Of 16 cord insertions evaluated, 16 (100%) had velamentous or marginal cord insertions in the donor twin, 8 (50%) in the recipient twin. The mean BW was greater in the CON grp (3608 ± 124) than both the NPC (2812 ± 138) and COC (2459 ± 856 gms) patients. A trend toward a lower mean BW was seen in the COC grp when compared to the NPC grp. The incidence of low BW (<2500 gms) was greater in both the NPC (22%) and COC (40%) grps when compared to the CON (6.8%) pts. A trend toward a higher incidence of LBW was shown among the COC exposed patients.

**Conclusions:** The survival of fetuses with strictly-defined TTTS should be assessed by randomized studies, or at least in one sac and oligohydramnios (largest pocket <2cm, or stuck twin) in the other. Chorionicity was confirmed by placental pathology, and gender was analyzed prenatally and confirmed postnatally.

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**226 NO GENDER DIFFERENCE IN TWIN-TWIN TRANSFUSION SYNDROME**

**Authors:** Drome V. Berghella, A. Silber, Division of Maternal Fetal Medicine, Department of Obstetrics and Gynecology, Jefferson Medical College, Thomas Jefferson University, Phila, PA

**Objective:** To evaluate a possible gender difference in twin-twin transfusion syndrome (TTTS), recently reported to be more common and severe in females (Noreis et al. Gender differences in twin-twin transfusion syndrome. Obstet Gynecol 1997;90:580-2.).

**Study Design:** All cases of TTTS at our institution between 1991 and 1996 were retrospectively reviewed. The diagnosis of TTTS required the presence of monochorial/diamniotic (MC/DA) placental (absence of twin-peak sign, thin membrane, single placenta, and same gender), and of polyhydramnios (largest pocket >8cm) in one sac and oligohydramnios (largest pocket <2cm or stuck twin) in the other. Chorionicity was confirmed by placental pathology, and gender was analyzed prenatally and confirmed postnatally.

**Results:** Thirty-three TTTS pregnancies were identified, of which 23 met the above strict criteria for TTTS. The mean gestational age (GA) at diagnosis was 19.1 weeks (range 15-18). Mean GA at delivery was 29.8 weeks (range 22-41). Of 16 cord insertions evaluated, 16 (100%) had velamentous or marginal cord insertions in the donor twin, 8 (50%) in the recipient twin. Pathological evaluation of chorionicity was available in 11 (73%) pregnancies; 18 (95%) were confirmed as monochorial/diamniotic, one was dichorionic. Twelve (46%) of the TTTS twins pairs were male, and 14 (54%) were female.

**Conclusion:** There was no male or female preponderance in fetuses affected by twin-twin transfusion syndrome.

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**227 WHAT ARE THE ODDS AGAINST THE SECOND TWIN?**

**Authors:** B. M. Rosen, Division of MFMU Network, Bethesda MD

**Objective:** To determine the natural history of twin-twin transfusion syndrome (TTTS) pregnancies.

**Study Design:** All cases of TTTS at our institution since 1991 and in a MEDLINE search since 1966 were retrospectively reviewed. The prenatal diagnosis of TTTS required the presence of monochorial/diamniotic (MC/DA) placental (absence of twin-peak sign, thin membrane, single placenta, and same gender), and of polyhydramnios (largest pocket >8cm) in one sac and oligohydramnios (largest pocket <2cm or stuck twin) in the other. Upon diagnosis, all patients were counseled as to the availability, risks and benefits of serial amniocenteses, laser therapy, septostomy, umbilical cord ligation and other medical and surgical interventions.

**Results:** Of 20 pregnancies identified at our institution with the above strict criteria for TTTS, 5 (19%) declined any intervention and were managed expectantly. The mean gestational age (GA) at presentation was 20.0 weeks (range 16-28), and at delivery 32.6 weeks (range 22-41). Five (100%) had velamentous or marginal cord insertions in the donor twin, and one in both twins. Pathological evaluation of chorionicity was available in 4 (80%) pregnancies, all confirmed as MC/DA. Four (40%) of the twins survived past the neonatal period, and are free of neurologic sequelae despite the death in-utero of their co-twin in 3 cases. From the literature, 38 fetuses with TTTS as defined above and managed expectantly were identified, of which 15 (39.5%) survived.

**Conclusion:** The survival of fetuses with strictly-defined TTTS managed expectantly is about 40%. Success of in-utero therapeutic intervention should be assessed by randomized studies, or at least compared to similar cases managed expectantly.

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**228 INCREASING NATAIL PREECLAMPSIA:}
230 THE EFFECT OF GENDER AND PAIRING ON NEONATAL OUTCOMES IN CONCORDANT TWINS

OBJECTIVE: To determine the impact of infant gender and gender pair on neonatal outcomes in concordant twin pairs admitted to our NICU.

STUDY DESIGN: All concordant twins (birthweight [BW] discrepancy <20%) admitted to our NICU from 1990-1998 were identified in an existing computerized neonatal database. All neonates were managed by a single group of physicians using standardized protocols. The following outcomes were evaluated: gestational age at birth (GA), BW, respiratory distress syndrome (RDS), bronchopulmonary dysplasia (BPD), intraventricular hemorrhage (IVH), necrotizing enterocolitis (NEC), and retinopathy of prematurity (ROP). We compared the outcomes of female (F) and male (M) twins and also considered if they were the product of a male/male (MM), male/female (MF), or female/female (FF) gender pair.

RESULTS: We identified 182 concordant twin pairs. The mean inter-twin BW difference was 9%. The rates of adverse outcomes are presented.

In addition, there were no differences in any of the outcomes when F and M or FF gender pair were compared to each other. Multiple logistic regression controlling for BW confirmed that RDS, BPD, and ROP but not IVH were independently associated with both gender pair and sex.

CONCLUSIONS: Males had worse outcomes than females as a whole. However, the males in the MF pairs had similar outcomes to their female sibs. MM pairs had higher rates of RDS, BPD, and ROP than either the MF or FF pairs. This suggests that the presence of the female sibling may be protective for male sibs with respect to lung and eye development.

231 THE OUTCOME OF TWIN PREGNANCIES WITH EXTREME Discordancy of Birth weight

OBJECTIVE: To examine the outcome of pregnancies with extreme weight-discordant twins.

METHODS: 212 pairs of twins were delivered between January 1984 and June 1998 in our medical center. Percentage of birthweight discordancy was defined as the birthweight difference between the twins divided by the larger twin's weight and multiplied by 100. This percentage was calculated for all twin births in which both fetuses were liveborn. In 23 pairs the discordancy was defined as extreme (>35%) and they constituted the study group. Twenty-three pairs of twins defined with mild weight discordancy (15-35%) and 23 pairs defined as concordant to birthweight (<15% difference) were matched to the study group patients based on gestational age at delivery (±7 days) and on the mode of delivery, and constituted the control group. The records of all the patients were reviewed for pregnancy complications and neonatal outcome variables (sepsis, respiratory distress syndrome, hyperbilirubinemia, intraventricular hemorrhage, necrotizing enterocolitis, retinopathy, or hypoglycemia).

RESULTS: The median discordance in the study and control groups was 40% (36-65%), 18% (15-25), and 6% (0-14), respectively. The median gestational age at delivery was 36 (30-40) weeks in all groups. Significantly more parturients in the study group had hypertensive disorders compared to women with concordant twins (50.4% vs. 8.7%, p = 0.05). Abnormal antepartum tests of fetal surveillance of the smaller fetus were significantly more common in the study group (39.1%, vs. 4.3% and 0%, p < 0.01 for both), respectively. There was one case of neonatal mortality of a 30 week 679 g delivered neonate (53% discordant) in the study group. Beside increased rate of retinopathy (17.4% vs. 0% in both control groups), hyperbilirubinemia (26.1% vs. 8.7% in both control groups), and hyperbilirubinemia (60.9% vs. 39.1% and 13.0%), no other differences in neonatal outcome variables were found between the smaller neonates in the three groups. Moreover, no significant differences in neonatal outcome were found between the larger neonates in the three groups.

CONCLUSION: Twin pregnancies with extreme discordancy may reach a median gestational age of 36 weeks, with fair neonatal outcome as compared to pregnancies with mild or no discordancy.

232 INCREASED MATERNAL WEIGHT GAIN IN TWINS IMPROVES PERINATAL OUTCOME

OBJECTIVE: To determine the impact of maternal BMI and weight gain in pregnancy on intrauterine growth and prematurity delivery in twin gestations.

METHODS: 641 women with twins enrolled in a multicenter, randomized trial of low dose aspirin for preeclampsia prevention. Maternal height, prepregnancy weight and BMI were determined at randomization between 13 and 26 weeks gestation. Maternal weight was recorded at all subsequent visits. Rates of overall weight gain, early weight gain (prior to first study visit and <26 weeks) and late weight gain were all calculated as lbs per week. The association between rates of maternal weight gain and BMI and selected outcome variables (delivery <35 wks, combined twin birthweight and SGA) were described using descriptive statistics, Chi-square for categorical analysis; and logistic regression and correlation coefficients for continuous analysis.

RESULTS: 253 (39%) of the 641 twins delivered <35 weeks gestation and the mean combined birthweight was 4420±1375 g. Rate of maternal weight gain was significantly associated (p=0.003) with prematurity; <0.5 lbs/week: 34.7% (37.7%); 0.5-1.0 lbs/week: 22/220 (37.3%); >1.0 lbs/week: 76/273 (27.5%) measured weight 35 wks. For each additional 1 lb/week gained in pregnancy the odds of delivery <35 wks were reduced 50%. BMI (r=0.135), total (r=0.299), early (r=0.134), and late (r=0.151) weight gain were all significantly correlated (p<0.01) with combined twin birthweight. Rates of maternal weight gain >1 lb/week was associated with a 40% reduction in the risk of either twin being SGA. The association of weekly weight gain and SGA was strongest in late pregnancy while the association with prematurity was 13% were significant in both early and late pregnancy.

CONCLUSIONS: Rates of maternal weight gain in twin gestations was significantly associated with perinatal outcome. Maternal weight gain of <1 lb/week was associated with significantly increased risks of both prematurity and retarded intrauterine growth.
232 DIFFERENCES IN TDx-FLM VALUES IN TWINS VERSUS SINGLETONS. T.F. McInrath, E.R. Norwitz, J.N. Robinson, E.S. Lieberman. Dept. of OB/GYN, Brigham & Women's Hospital, Boston, MA.

OBJECTIVE: To define and quantitate gestational age-specific differences in pulmonary maturity as defined by the TDx-FLM assay between singletons and twins.

STUDY DESIGN: A retrospective analysis was performed on all deliveries from 28 to 37 weeks' gestation at the Brigham & Women's Hospital between November 1994 and August 1995. Of the 963 singleton and twin non-diabetic pregnancies, 188 (20%) had amniotic fluid TDx-FLM measurements within 72 h of delivery (161/856 singletons [19%] and 27/107 [25%] twin pregnancies; p=0.11). Multiple linear and logistic regression analyses in addition to chi square and t-tests were performed to compare TDx-FLM values.

RESULTS: There was no statistical difference between pregnancy complications or corticosteroid treatment between tested singletons and twins.

<table>
<thead>
<tr>
<th>Antenatal event</th>
<th>Singletons</th>
<th>Twins</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPROM</td>
<td>87 (54%)</td>
<td>13 (48%)</td>
</tr>
<tr>
<td>PTL</td>
<td>98 (61%)</td>
<td>15 (56%)</td>
</tr>
<tr>
<td>PIH</td>
<td>11 (6%)</td>
<td>2 (7%)</td>
</tr>
<tr>
<td>Antenatal steroids</td>
<td>58 (36%)</td>
<td>8 (30%)</td>
</tr>
</tbody>
</table>

Logistic regression controlling for gestational age showed no preference for twin over singleton pregnancies to receive TDx-FLM screening (OR:1.38; 95% CI, 0.83-2.30). Mean (95% CI) TDx-FLM values by gestational age were significantly greater among twins:

<table>
<thead>
<tr>
<th>Weeks' gestation</th>
<th>Singletons</th>
<th>Twins</th>
</tr>
</thead>
<tbody>
<tr>
<td>28-32.9</td>
<td>47.4 (34.7-60.0)</td>
<td>62.0 (38.5-85.4)</td>
</tr>
<tr>
<td>33-35.9</td>
<td>65.2 (57.6-72.0)</td>
<td>87.8 (72.6-103.4)</td>
</tr>
<tr>
<td>36-37.9</td>
<td>77.0 (70.5-83.3)</td>
<td>99.7 (84.7-115.1)</td>
</tr>
</tbody>
</table>

Controlling for gestational age with ordinary least squares regression, the TDx-FLM value for twin pregnancies was on average 21.4 points (95% CI, 9.1-33.7) higher than that for singletons.

CONCLUSION: At any gestational age, twins appear to have a 21 point higher TDx-FLM value than singletons. Current literature suggests that the risk of RDS is not different for singletons and twins at any given gestational age. These data suggest therefore that different TDx-FLM cutoff values be used for singletons and twins when calculating the risk for RDS.

234 WITHDRAWN

235 CESAREAN DELIVERY OF TWINS AND NEONATAL RESPIRATORY DISORDERS. A. Madden, S. Chasen, F. Chervenak. Department of OB/GYN, New York Hospital/Cornell Medical Center, New York, NY.

OBJECTIVE: Studies have shown an increased risk of neonatal respiratory disorders with cesarean delivery prior to labor before 39 weeks gestation in singleton pregnancies. There is evidence that lung maturity is achieved earlier in twin pregnancies. The objective of this study is to determine the risk of neonatal respiratory disorders with cesarean delivery prior to labor in twin pregnancies based on gestational age.

STUDY DESIGN: The charts of all patients with twin pregnancies who underwent cesarean delivery after 36 0/7 weeks were reviewed. All cases in which delivery was done for a clear maternal (e.g. preeclampsia) or fetal (e.g. IUGR) indication were excluded. Clinical data were obtained from review of maternal and neonatal charts. Neonatal respiratory disorder included transient tachypnea of the neonate (TTN) or respiratory distress syndrome (RDS), and these diagnoses were made by neonatologists. But were analyzed with student's t test and chi-square analysis.

RESULTS: Cesarean delivery before labor was performed on 140 women with twin pregnancy after 36 0/7 weeks. The mean gestational age at delivery in the study group was 37.5 ± 0.9 weeks (range 36.0 to 40.2 weeks). The indication for cesarean delivery was malpresentation of one or both twins in 69.9% of cases. Respiratory disorders were diagnosed in 7.5% of neonates. Of all pregnancies included in the study, 11% had one or both neonates affected. The incidence of neonatal respiratory disorders in one or both twins was significantly higher in cases where cesarean delivery was performed before 36 0/7 weeks (17.8% vs. 0%, p < 0.02). The indication for cesarean delivery was malpresentation of one or both twins in 69.9% of cases. Respiratory disorders were diagnosed in 7.5% of neonates. Of all pregnancies included in the study, 11% had one or both neonates affected. The incidence of neonatal respiratory disorders in one or both twins was significantly higher in cases where cesarean delivery was performed before 36 0/7 weeks (17.8% vs. 0%, p < 0.02).

CONCLUSIONS: Neonatal respiratory disorders are more common in twin pregnancies with cesarean delivery prior to the onset of labor before 38 0/7 weeks. In the absence of a clear maternal or fetal indication for delivery, consideration should be given to avoiding cesarean delivery until the spontaneous onset of labor or until after 38 completed weeks should be considered.

236 THE OUTCOME IN T NI. Thaler, S. Center and OBJECT: performed neonatal c pregnancy study invol for the study performed ane embry as multiple p

RESULT: weeks gest reported in subset of recorded, p<0.05.

CONCLUSION simple a pregananc ordered mult abdominal

Objective: A major source of multiple pregnancies is the use of assisted reproductive technologies. Selective fetal reduction, routinely performed transabdominally, is used to decrease the obstetrical and neonatal complications associated with these pregnancies. The overall pregnancy loss rate (death to 24 weeks) of this procedure based on a multicenter study involving 1775 cases was 11.7% (J Soc Gynecol Invest 1996;3:25-6).

The subgroup of high order (≥4) multiple pregnancies had a pregnancy loss rate increased to 15.3%. We report our experience with early (7 to 8 weeks’ gestation) transvaginal embryo aspiration for early selective reduction.

Study design: Retrospective case series of 90 early transvaginal embryo aspiration, of which 30 were performed in high order (≥4) multiple pregnancies.

Results: The overall pregnancy loss rate (early and late abortion up to 24 weeks gestation) was 6.7%. This rate is not statistically different from that of the control in early diabetic pregnancy.

Conclusions: Transvaginal embryo aspiration in early gestation is a simple and safe procedure for selective reduction in multifetal pregnancies. The outcome of the early transvaginal procedure in high order multiple pregnancies (≥4) is better compared to the routinely used abdominal approach in later gestational weeks.
A RANDOMIZED, DOUBLE-BLIND COMPARISON OF AMPICILLIN/SULBACTAM AT 1.5 G AND 3.0 G DOSES FOR THE TREATMENT OF POSTPARTUM ENDOMETRITIS. K.C. Perry, J.E. Larmon, J.F. Cadle,* C.M. Isler,* R.W. Martin. Department of Ob/Gyn, University of Mississippi Medical Center, Jackson, MS.

OBJECTIVE: To compare the efficacy, safety and cost of parenteral ampicillin/sulbactam at 1.5 g or 3.0 g doses for the treatment of postpartum endometritis.

STUDY DESIGN: Candidates for the investigation were chosen from hospital records with postpartum endometritis. One-hundred patients were randomized to receive either ampicillin/sulbactam 1.5 g IV every 6 hours (1.5 g group) or ampicillin/sulbactam 3.0 g IV every 6 hours (3.0 g group). Endometrial and blood specimens were obtained for culture and sensitivity testing. The antibiotic regimen was changed to triple antibiotics in those patients not responding to therapy. A therapeutic success was defined as a decrease in temperature and uterine tenderness within the first 36 hours with complete resolution by 72 hours without a change in antibiotics. The primary outcome measures were cure rates at 48 and 72 hours. Other outcome variables included side effects and cost of antibiotic therapy.

RESULTS: Fifty patients were randomized to the 1.5 g group and 50 to the 3.0 g group. The demographic characteristics and the length of rupture of membranes were similar between the two groups. The number of positive endometrial and blood cultures were similar between the two groups. The number of patients requiring a change in antibiotic therapy within 48 hrs was greater in the 1.5 g group than in the 3.0 g group (16% vs 10%), but this did not reach statistical significance (p > 0.05). The cure rates were significantly higher in the 3.0 g group than the 1.5 g group at 48 and 72 hours (62% vs 40% and 76% vs 54%, p < 0.001). The side effects including headache, diarrhea, nausea and rash were infrequent but similar between the two groups. The average cost of antibiotic therapy was higher between the two groups. The average cost of antibiotic therapy was higher in the 3.0 g group ($494.30±111.80) than the 3.0 g group ($494.30±111.80, but this was not statistically significant (p > 0.05).

CONCLUSION: Ampicillin/sulbactam $5 IV every 6 hours is more effective than ampicillin/sulbactam 1.5 g every 6 hours for the treatment of postpartum endometritis without increasing the cost of antibiotic therapy.


OBJECTIVE: To compare the efficacy, safety and side effects of intra-amniotic (15a)-15-methyl-PGF2a (15-M-PGF2a) and intravaginal misoprostol for second trimester uterine evacuation.

STUDY DESIGN: Candidates for the investigation were chosen from those patients presenting with a singleton pregnancy between 17 and 24 weeks with an indication for a therapeutic second trimester termination. Patients were excluded if they had an intrauterine fetal demise, oligohydramnios, or a contraindication to receiving prostaglandins. Fifty-one patients were randomized to receive either either a single 2.5 mg intra-amniotic injection of 15-M-PGF2a or two 250 mcg doses of intravaginal misoprostol at 12 hour intervals. Those undelivered at 24 hours received dinoprostone 20 mg intravaginal suppositories every 3 hours. The primary outcome measure was evacuation of the uterus within 24 hours. Secondary outcome measures included duration of abortion, incidence of complete abortion, blood loss, incidence of side effects and complications.

RESULTS: Twenty-six patients were randomized to receive intra-amniotic 15-M-PGF2a and 25 patients were randomized to receive intravaginal misoprostol. The demographic characteristics were similar between the two groups. The majority of patients underwent pregnancy termination for fetal malformations. The mean time from initiation of termination until uterine evacuation was shorter in the 15-M-PGF2a group than the misoprostol group (17.5 ± 8.6 hours versus 22.3 ± 12.5 hours) but this was not statistically significant (p > 0.05). The rate of successful evacuation at 24 hours was significantly higher in the 15-M-PGF2a group than the misoprostol group (88% versus 60%, p = 0.02). The complete abortion rate was similar between the two groups (82% vs 92%, p > 0.05). The incidence of side effects, complications, and estimated blood loss were similar in both groups.

CONCLUSION: The use of intra-amniotic 15-M-PGF2a for midtrimester therapeutic pregnancy terminations is safe and associated with a greater number of successful uterine evacuations within 24 hours without an increase in adverse effects when compared to intravaginal misoprostol.

IS OXYTOCIN HAZARDOUS FOR THE MANAGEMENT OF LABOR IN GRANDMULTIPAROUS WOMEN? Z. Ben-Aroya1, T. Silberstein1, M. Friger2, D. Yochai1, M. Katz1 and M. Mazor3. Dept. OB/GYN, Soroka Medical Center1 and the Dept. of Epidemiology2, Faculty of Health Sciences, Ben-Gurion University of the Negev, Beer-Sheva, Israel.

OBJECTIVE: To determine whether the use of oxytocin in the management of labor in grandmultiparous women increases the risk of peripartum complications.

STUDY DESIGN: Between the years 1989-1995, 11702 grandmultiparous women (parity≥6) delivered in the Soroka University Medical Center, 533 grandmultiparous women, management of labor included use of intravenous oxytocin. The control group consisted of 10852 multiparous women who did not have any use of oxytocin during the process of labor. All women were monitored for fetal heart rate (FHR) and uterine activity using continuous tocodynamometer. We compared the rates of placental abruption, fetal distress, intrapartum death (IPD), post-partum hemorrhage (PPH), uterine rupture, retained placenta and the need for manual lysis, vaginal and cervical tears, Cesarean sections and vacuum deliveries in these two groups by using x2 analysis and Fisher's exact test when appropriate.

RESULTS: No significant differences were found between the control group and the control group in the rates of placental abruption (1.1% vs 0.95%), IPD (0.4% vs 0.1%), PPH (0.6% vs 0.4%), vaginal tears (4.5% vs 4.5%) and cervical tears (0.2% vs 0.2%) respectively. In contrast, a significant increase in the rates of fetal distress (6.0% vs 3.8%, p=0.011), Cesarean sections (16.1% vs 11.6%, p=0.002) and vacuum deliveries (5.2% vs 1.4%, p=0.001) was observed in women in the oxytocin group as compared to the control group.

CONCLUSIONS: The use of oxytocin in the grandmultiparous parturient is a relatively safe procedure. However, due to the rates of fetal distress and Cesarean sections, the use of continuous FHR monitoring is advisable.
CERVICAL DILATATION AT CESAREAN FOR LABOR ARREST: D Roue, J Ken, J Hauth. Dept. of OB/GYN, Univ. of Alabama at Birmingham, Birmingham AL.

OBJECTIVE: To characterize the distribution of cervical dilatations at which cesarean deliveries are performed for labor arrest.

STUDY DESIGN: Retrospective analysis of women who entered either of two randomized trials of cesarean techniques conducted at our hospital from 6/89-91 and 5/95-11/94. Women were eligible for analysis if they experienced labor (induced, augmented, or spontaneous), had labor arrest (failure of induction, active phase arrest, failure of descent) as a cesarean indication, and had a cervical examination recorded proximate to their indication. Cervical dilatations at cesarean were grouped from 0-3 cm (latent phase), 4-9 cm (active phase), and complete dilatation. Since not all laboring women have entered the active phase at 4 cm, the number of cesareans performed at 4 cm was also tabulated.

RESULTS: 509 of 1,300 women (28%) who were enrolled in the two randomized trials were eligible. Overall, 16% of cesarean for labor arrest were performed at 0-3 cm, 64% at 4-9 cm, and 20% at complete dilatation. In total, 56% (147 of 406) of 1st stage cesareans were performed at 0-4 cm. Parity had little influence on the rates of latent and active phase cesarean. However, nulliparous had a higher rate of 2nd stage cesarean than parous women, 25% vs. 16%.

CONCLUSIONS: These data illustrate that women who undergo cesarean for labor arrest do so across the entire spectrum of cervical dilatation. Because a substantial portion of cesareans for abnormal labor progress are performed at 0-4 cm, development of an evidence-based definition of failed induction would likely reduce the current high number of cesareans which, for the purposes of national data collection, are most frequently attributed to "dystocia."

HIGH CONCENTRATION OF INTERLEUKIN-6 (IL-6) IN THE BLOOD SERUM OF PREGNANT WOMEN AS AN INDEX OF FAILURE IN TOCOLYTIC TREATMENT: P. Orzechowski, E. Malafiej, A. Picta, E. Wierzbicka From the Clinic of Perinatology, Institute of the Polish Mother Memorial Hospital in Lodz, Poland.

OBJECTIVE: A common cause of pre-term labours is an intrauterine infection. The infection is mainly diagnosed on the basis of laboratory indices. A sensitive index of infection is an increased concentration of proinflammatory cytokines, among other -IL-6. One of the stimulators of IL-6 secretion is endotoxin. IL-6 plays an important part in the initiation of the acute phase reaction.

STUDY DESIGN: The studies covered 62 pregnant women with symptoms of imminent pre-term labour in whom tocolytic treatment was applied. Among others, the level of IL-6 in their blood was evaluated. After the labour, histopathologically evaluated were fetal appendages and clinically evaluated was the fetus - with the aim of finding a congenital infection. The obtained results were compared by the t-test and small samples test.

RESULTS: In 39 pregnant women the tocolytic treatment appeared to be ineffective; the mean concentration of IL-6 in those women came to 24.8 (pg/ml), whereas in the group of women in whom the treatment was successful - 9.5 (pg/ml). The difference is statistically significant for p< 0.05. In 27 cases of pre-term labours a congenital infection in newborns was found. Among the pregnant labourers and infections the average values of IL-6 concentrations reached 28.1 (pg/ml), whereas in pregnant women with pre-term labours without infections the concentration was 13.6 (pg/ml). The difference is statistically significant for p< 0.05.

CONCLUSIONS: High concentrations of IL-6 in the blood serum of pregnant women with symptoms of pre-term labour prognose badly for tocolytic treatment.

LABOR COMPLICATIONS BY WEEK OF GESTATION: 40, 41, AND 42 WEEKS J.M. Alexander, DD McIntyre,* KJ Leveno. Dept. Ob/Gyn, Univ. of TX Southwestern Medical Ctr, Dallas, Texas.

OBJECTIVE: To compare the incidence of labor complications at 40, 41, and 42 weeks gestation when intervention is practiced routinely at 42 weeks but not at 41 weeks.

STUDY DESIGN: Retrospective analysis of singleton cephalic liveborn infants without malformations, delivered from 1 January 1988 to 31 December 1997. Women with hypertension, diabetes and prior cesareans were excluded. Statistical methods included Chi-square.

RESULTS:

<table>
<thead>
<tr>
<th>Weeks gestation</th>
<th>40 n (%)</th>
<th>41 n (%)</th>
<th>42 n (%)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnancies</td>
<td>31,054(100)</td>
<td>17,122(100)</td>
<td>11,441(100)</td>
<td>-</td>
</tr>
<tr>
<td>Inductions</td>
<td>667(2)</td>
<td>990(6)</td>
<td>3519(31)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Cesarean:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1813(6)</td>
<td>1524(9)</td>
<td>1444(13)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Dystocia</td>
<td>1012(3)</td>
<td>852(5)</td>
<td>888(8)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Fetal Distress</td>
<td>629(2)</td>
<td>532(3)</td>
<td>450(4)</td>
<td>&lt;0.001*</td>
</tr>
</tbody>
</table>

*p<0.001 for 40 vs 41 and 41 vs 42 weeks.
** p<0.001 for 40 vs 41 weeks; p=0.28 for 41 vs 42 weeks.

CONCLUSIONS: Labor complications and cesarean deliveries progressively increased in incidence from 40 to 41 to 42 weeks gestation. Meconium incidence decreased significantly at 42 weeks, likely the result of routine intervention for prolonged pregnancy.

PERINATAL MORTALITY BY WEEK OF GESTATION IN LATE PREGNANCY J.M. Alexander, DD McIntyre,* KJ Leveno. Dept. Ob/Gyn, Univ. of TX Southwestern Medical Ctr, Dallas, Texas.

OBJECTIVE: To compare the incidence of stillbirths and neonatal deaths for each week of gestation from 37 to 42 weeks and mortality in routine intervention for prolonged pregnancy.

RESULTS:

<table>
<thead>
<tr>
<th>Weeks gestation</th>
<th>37 n (%)</th>
<th>38 n (%)</th>
<th>39 n (%)</th>
<th>40 n (%)</th>
<th>41 n (%)</th>
<th>42 n (%)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>9906(100)</td>
<td>2626(23)</td>
<td>2626(23)</td>
<td>2626(23)</td>
<td>2626(23)</td>
<td>2626(23)</td>
<td></td>
</tr>
<tr>
<td>Mortality</td>
<td>600(6)</td>
<td>990(6)</td>
<td>990(6)</td>
<td>990(6)</td>
<td>990(6)</td>
<td>990(6)</td>
<td></td>
</tr>
<tr>
<td>Significant</td>
<td>1813(6)</td>
<td>1524(9)</td>
<td>1444(13)</td>
<td>1333(11)</td>
<td>1222(10)</td>
<td>1111(9)</td>
<td></td>
</tr>
<tr>
<td>Babies</td>
<td>1012(3)</td>
<td>852(5)</td>
<td>888(8)</td>
<td>888(8)</td>
<td>888(8)</td>
<td>888(8)</td>
<td></td>
</tr>
<tr>
<td>Significant</td>
<td>1012(3)</td>
<td>852(5)</td>
<td>888(8)</td>
<td>888(8)</td>
<td>888(8)</td>
<td>888(8)</td>
<td></td>
</tr>
<tr>
<td>Fetal Distress</td>
<td>629(2)</td>
<td>532(3)</td>
<td>450(4)</td>
<td>450(4)</td>
<td>450(4)</td>
<td>450(4)</td>
<td></td>
</tr>
<tr>
<td>Significant</td>
<td>629(2)</td>
<td>532(3)</td>
<td>450(4)</td>
<td>450(4)</td>
<td>450(4)</td>
<td>450(4)</td>
<td></td>
</tr>
</tbody>
</table>

*p<0.001 for 40 vs 41 and 41 vs 42 weeks.

CONCLUSIONS: There was no significant difference in perinatal mortality from 39 to 42 weeks gestation when intervention occurred routinely at 42 weeks but not at 41 weeks gestation.
248 CONTROVERSIAL ISSUES WITH VAGINAL BIRTH AFTER CESAREAN AND RISK OF UTERINE RUPTURE: C.A. Lyons, C.V. Towers, P.J. Runney*, D. Ahdoot*, D. Friend*, C.A. Major, T. Asrat. Long Beach Memorial Women's Hospital, Long Beach CA, University of California, Irvine, Orange, CA, Hoag Memorial Hospital Presbyterian, Newport Beach, CA and Saddleback Memorial Women's Hospital, Laguna Hills, CA.

OBJECTIVE: The use of pitocin was seen in the majority of cases but rates greater than version were identified in less than 1/5 of the patients with uterine rupture. Our data were identified out of 118,374 deliveries. 50 had 1 prior cesarean and 7 had ARNOUM THE TIME OF FETAL VIABILITY.

RESULTS: 57 patients with a uterine rupture of a previous LSTCS scar were identified out of 118,374 deliveries. 50 had 1 prior cesarean and 7 had ARNOUM THE TIME OF FETAL VIABILITY. 20mlU/min was small. The use of prostin gel, number of previous cesarean sections and external cephalic version were identified in less than 1/5 of the patients with uterine rupture. Our data reveal that the majority of previous LSTCS uterine closures were double layer. The use of prostin gel, number of previous cesarean sections and external cephalic version were identified in less than 1/5 of the patients with uterine rupture. The use of pitocin was seen in the majority of cases but rates greater than 20mlU/min was small.

CONCLUSION: This is one of the largest reviews in the literature reporting on uterine rupture of a prior LSTCS scar. Our data reveal that the majority of previous LSTCS uterine closures were double layer. The use of prostin gel, number of previous cesarean sections and external cephalic version were identified in less than 1/5 of the patients with uterine rupture. The use of pitocin was seen in the majority of cases but rates greater than 20mlU/min was small.


OBJECTIVE: The use of cervical cerclage versus bed rest around the time of fetal viability is controversial. The purpose of this study is to compare the use of cervical cerclage versus bed rest in response to an ultrasound diagnosis of cervical incompetence between 20 and 24 weeks’ gestation.

STUDY DESIGN: We retrospectively reviewed our ultrasound records from 9/92 to 12/98 for women at risk for spontaneous pregnancy loss and preterm labor who were followed with serial cervical transvaginal sonography and transfundal pressure between 16 and 24 weeks’ gestation. Multiple gestations were excluded. We identified women who developed an ultrasound diagnosis of cervical incompetence defined as progressive cervical shortening to <2 cm between 20 and 24 weeks’ gestation. The decision to treat with either bed rest or cerclage was left to the physicians in charge. Comparisons were made using unpaired t-test and Chi-square analysis with significance set at p<0.05.

RESULTS:

<table>
<thead>
<tr>
<th>Bed rest</th>
<th>Cerclage</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=17</td>
<td>N=28</td>
</tr>
<tr>
<td>Gestational age at diagnosis of cervical incompetence (weeks)</td>
<td>22.8±1.2 vs 21.6±1.5</td>
</tr>
<tr>
<td>Shortest cervical length before treatment (cm)</td>
<td>1.42±0.4 vs 0.75±0.5</td>
</tr>
<tr>
<td>Gestational age at delivery (weeks)</td>
<td>34.3±1.7 vs 37.5±2.6</td>
</tr>
<tr>
<td>Mean±SD</td>
<td>7/8/9</td>
</tr>
<tr>
<td>&lt;24</td>
<td>1</td>
</tr>
<tr>
<td>24-28</td>
<td>1</td>
</tr>
<tr>
<td>29-32</td>
<td>2</td>
</tr>
<tr>
<td>33-36</td>
<td>7</td>
</tr>
<tr>
<td>≥37</td>
<td>6</td>
</tr>
</tbody>
</table>

CONCLUSION: Despite a significantly earlier time of ultrasound diagnosis of cervical incompetence and significantly shorter cervical length before institution of treatment, treatment with cervical cerclage for an ultrasound diagnosis of cervical incompetence between 20 and 24 weeks’ gestation resulted in significantly better pregnancy outcome than treatment with bed rest only.

250 VAGINAL DELIVERY DELIVERS CESAREAN SECTION FOR TRIPLET AND QUADRUPOLETs: NO DIFFERENCE IN IMMEDIATE MEASUREMENTS OF NEONATAL OUTCOME. C. Shipstead, AM Mallinow*, LS Alger, Dept. Ob/Gyn/Repro Sciences, Univ of Maryland School of Medicine, Baltimore, MD.

OBJECTIVE: Cesarean section (CS) is generally advocated as the delivery method of choice in triplets or quadruplets (quads) despite the lack of evidence for superiority of this method compared to vaginal delivery (VD). The null hypothesis is that triplets and quads delivered vaginally do not have lower Apgar scores or umbilical artery (UA) blood pH when compared to those delivered by CS.

METHOD: All women delivered of triplets or quads at greater than 20 weeks gestation in the last 10 years were identified in the delivery database. Maternal age, parity, gestational age, obstetric mode of delivery, type of anesthesia, Apgar scores and umbilical cord blood gases were recorded. Analysis of variance and $x^2$ tests were used to identify significant differences between groups, defined as p<0.05.

RESULTS: 25 triplet and 3 quad gestations delivered during the study period, resulting in 86 live births for which data was available. 18 patients (46%) were delivered by CS (VD 36%). All deliveries were attended by staff perinatologists, obstetric anesthesiologists and neonatologists. There was no difference in maternal age, parity, gestational age at delivery, type of anesthesia, or the use of antenatal steroids by mode of delivery.

CONCLUSION: Vaginal delivery of triplets and quads is not associated with lower Apgar scores or UA pH compared to CS despite longer delivery intervals. This data suggests that a trial of labor and vaginal delivery can be safely accomplished in a perinatal center.

251 ANCILLARY SERVICE UTILIZATION BY PREGNANT MEDICARE MANAGED CARE PATIENTS: HOSPITAL CLINIC vs. PRIVATE OFFICE. P.T. Egan, M. Dannman*, S. Powell*, P. Kabick*, C. Ingardia, S. Currie*, Saint Francis Hospital and Medical Center, Hartford, CT, Hartford Hospital, Hartford, CT, and Univ of CT Health Center, Farmington, CT

OBJECTIVE: To measure the utilization of social and ancillary services by Medicare Managed Care (MMC) insured pregnant women in a hospital based, resident clinic (HC) or a private office (PO) in an urban population.

STUDY DESIGN: Data was prospectively collected on all deliveries at Hartford Hospital and Saint Francis Hospital and Medical Center from July 1, 1996 - June 30, 1997 of women who resided in Hartford and had had prenatal care at the time of delivery. Data included: site of prenatal care, maternal age, language, race, ethnicity, marital status, employment, level of education, smoking, substance abuse, domestic violence, homelessness, community maternal and infant outreach visits, social work contact, transportation assistance, medications given, and referrals for: smoking cessation substance abuse, teenage pregnancy, nutrition counseling, home healthcare, preterm birth prevention. Descriptive statistics, Chi square and the Student t test were used. A p value of <.05 was considered significant.

RESULTS: Of the 1,285 women who were cared for in an HC and 979 at a PO. There were no differences regarding maternal age, U.S. Citizenship status, language spoken, marital status or level of education. There were differences in specific insurance plans, race, ethnicity, and employment. There was a higher incidence in marijuana use (10.3% vs. 5.9%, p=0.017), heroin use (1.5% vs. 0.65%, p=0.042) and domestic violence (6.9% vs. 1.9%; p<0.000) in the HC. There was also a higher incidence of homelessness (1.1% vs. 0%, p<0.05) in the HC.

<table>
<thead>
<tr>
<th>CLINIC, %</th>
<th>OFFICE, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outreach visits</td>
<td>2.1</td>
</tr>
<tr>
<td>Social work contact</td>
<td>38.2</td>
</tr>
<tr>
<td>Medications given</td>
<td>53.8</td>
</tr>
<tr>
<td>Smoking cessation referral</td>
<td>9.3</td>
</tr>
<tr>
<td>Smoking cessation substabuse</td>
<td>9.5</td>
</tr>
<tr>
<td>Teen clinic</td>
<td>15</td>
</tr>
<tr>
<td>Nutrition referral</td>
<td>60.9</td>
</tr>
<tr>
<td>Home healthcare</td>
<td>41.8</td>
</tr>
<tr>
<td>Preterm birth counseling</td>
<td>60.7</td>
</tr>
</tbody>
</table>

CONCLUSIONS: The MMC pregnant women in an HC or PO study were similar in demographics and social history except for a higher incidence of substance abuse, homelessness and domestic violence in the HC. Social and ancillary services were more frequently ordered and used in the HC.
252 FETAL HEART RATE RESPONSE TO STRENUOUS EXERCISE IN LATE GESTATION. A. MacDonald, G. A. Davidson, R. Victoria, L. A. Wolfe, School of PH2 and Dept. of Ob/Gyn and Physiology, Queen's University, Kingston, ON

OBJECTIVE: To determine the fetal response to and safety of maximal maternal exercise in the third trimester.

STUDY DESIGN: Twenty-three active women with uncomplicated singleton pregnancies between 31-38 wks gestation underwent maximal exercise testing by cycling at 20W for 4 min followed by a ramp increase in work rate of 20W to exhaustion. The fetal heart rate was monitored for two consecutive 10 min segments before and after testing. Fetal heart rate characteristics were classified using NICHD guidelines. Paired Student's t-statistics were used to compare continuous variables before and after testing. Repeated measures ANOVA with the Tukey-Kramer multiple comparisons post-test was used for comparison of continuous data over the 4 time periods. Chi-squared analysis was used for comparison of ordinal data.

RESULTS: There was an increase in baseline fetal heart rate in the second post-test period (mean 145.2 beats/min ± 1.8) compared to the 2 pretest periods, (means 139.2 beats/min ± 8.7, p<0.05 and 138.5 beats/min ± 9.6, p<0.01). There were fewer accelerations in the second post-test period (mean 1.48 ± 1.24) compared to the second pretest period, (mean 2.45 ± 1.6, p<0.01). Decelerations were infrequent and no differences were noted. There was an increased time to reactive post-testing (19.1 min ± 9.7) compared to pretesting, (10.6 min ± 7.3, p<0.0001). One undiagnosed growth restricted fetus had a bradycardia lasting 6 min which resolved. There were no abnormal neonatal outcomes.

CONCLUSIONS: Maximal third trimester maternal exertion leads to minimal changes in the fetal heart rate. Fetal bradycardic responses were not seen in normally grown fetuses, suggesting that maximal maternal exertion is safe in this group.

Supported by U.S. Army Medical Research and Materiel Command Contract # DAMD17-96-C-6112, Ontario Thoracic Society and NSERC (Canada)

254 ABNORMAL PAP SMEAR IN PREGNANCY: CORRELATION BETWEEN CYTOLOGY, COLPOSCOPY, AND CERVICAL BIOPSIES. C. Andronicos, A. Sciscione, S. Pearlman, K. Lee, M. D'Alton, Division of Maternal-Fetal Medicine and Neonatology, Christiana Hospital, Newark, DE and Division of Maternal-Fetal Medicine, New England Medicine Center, Tufts University School of Medicine, Boston, MA.

OBJECTIVE: To determine whether colposcopically directed biopsies were beneficial in the management of abnormal Pap smear during pregnancy and at six weeks postpartum.

STUDY DESIGN: Pregnant women whose Pap smears were abnormal underwent colposcopy during pregnancy and at six weeks postpartum. Cervical biopsies were obtained when advanced lesions were suspected. Results of antenatal colposcopic studies and cervical biopsies were compared with postpartum colposcopic evaluations and biopsies.

RESULTS: Two-hundred and twenty women underwent colposcopy. Of these, 75 underwent cervical biopsies. Forty-nine had biopsies during pregnancy and at postpartum evaluation. Concordance between cervical cytology and histologic diagnosis was found in 31 cases (63%), less severe lesions were found in 10 (20%), and more advanced lesions in eight (16%). Colposcopy was judged consistent with Pap smear findings in 173 women, and overall concordance between cytology and colposcopy was 92% (204 of 222 women). Twenty-six women had cervical biopsies only during postpartum evaluation; Concordance between antenatal Pap smears and postpartum biopsies was found in 14 (54%), less severe lesions in four (15%), and more advanced lesions in eight women (31%). No invasive cervical cancer was found, and information obtained by cervical biopsies did not change management during pregnancy.

CONCLUSION: There was no correlation between Pap smear results, colposcopic findings and cervical biopsies during pregnancy. Cervical biopsies are generally unnecessary in the management of abnormal Pap smear in pregnancy.
256 DISTRIBUTION OF STUDY DESIGN IN TWO OBSTETRICS AND GYNECOLOGY JOURNALS. EF Rosenbaum, EJ Funai, MJ Lee, G De Priore, Dept. Of Ob/Gyn, NYU School of Medicine, NY, NY.

OBJECTIVE: To classify articles, based on study design, in The American Journal of Obstetrics and Gynecology (AJOG) and Obstetrics and Gynecology (O&G).

STUDY DESIGN: One year of each journal beginning May 1997 was reviewed (excluding supplements). Articles were initially classified as clinical research. Additional studies or basic science. Articles devoted to clinical research were further classified as observational or experimental. Experimental studies were subcategorized as controlled or uncontrolled. Controlled trials were further subcategorized as randomized or non-randomized. Other studies were noted and letters to the editor were excluded.

RESULTS: 469 articles were reviewed in the twelve issues of AJOG and 369 articles in O&G. AJOG dedicated 84% of articles to clinical research versus 97% in O&G (p = <0.0001). There were 10.7% vs. 1.1% animal studies (p = <0.0001) and 5.3% vs. 1.9% basic science (p = <0.01). In AJOG 66% of all articles were observational compared to 72% in O&G (p = ≤0.055). 11% vs. 15% were experimental (p = 0.065). In the clinical experimental category 10.9% of all articles published in AJOG were controlled vs. 14.6% in O&G (p = 0.105). There were 8.8% randomized control trials in AJOG and 11.1% in O&G (p = 259, 2.3% vs. 4.5% were non-randomized (p = 0.105). 0.2% vs. 0.8% were uncontrolled (p = 0.211). Out of the experimental articles, 98.1% in AJOG and 94.7% in O&G were controlled (p = 0.35) and 1.9% vs. 5.3% were uncontrolled (p = 0.354). 78.8% of the experimental articles in AJOG were randomized vs. 71.9% in O&G (p = 0.494). 21.2% vs. 98.1% were non-randomized (p = 0.251).

CONCLUSIONS: This study reveals a significant difference in the percentage of articles dedicated to clinical research between the two journals. A difference, although not significant, was found between the percentages of observational and experimental articles. Under the U.S. Preventive Services Task Force rating system, the randomized control trial is given the highest rating, that of class I evidence. The drive toward evidence-based clinical practice may not be fully supported by researchers in OB/GYN, as reflected by their submissions and subsequent publications in the major OB/GYN journals.

257 LIMITATIONS OF THE U.S. NATIONAL NATIVITY STATISTICS. IM Bernstein, AG Fry, GJ Badger, Departments of Ob/Gyn and Med. Biostatistics, Univ. of VT, Burlington, VT.

OBJECTIVE: To examine and evaluate the contents of the US National Natality data set as supplied by the U.S. Center for Health Statistics to determine its usefulness as a standard for the characterization of pre-term birth weight across gestational ages.

METHODS: We examined the 1995 U.S. Natality data set. Birth weights were evaluated between 26 and 37 weeks gestation. We compared mean and median birth weights as well as birth weight distribution at each gestational age. We evaluated different definitions available within the data set for establishing gestational age to determine their relative impact on birth weight distributions. Specifically, we compared gestational age defined solely by LMP with gestational defined by LMP or clinical estimate if the clinical estimate varied by more than 2 weeks from LMP dating.

RESULTS: In the early trimester (27-32 weeks gestation) we observed differences between the estimates of the mean and median birth weights employing last menstrual period to establish gestational age. This result from a bimodal distribution of birth weight. The cluster of birth weights at the higher end represents as many as 50% of the birth weights at specific gestational ages. This clustering is reduced when clinical estimates of gestational age are used to establish gestational age. The correlation between the estimates of the mean and median across gestational age is greater when clinical estimates of gestational age are used. (LMP r=0.33, P-NS, clin. estimates r=0.74, P=0.01).

CONCLUSIONS: There appears to be considerable incorrect assignment of gestational age when the LMP is used rather than clinical estimates to establish the age at birth for newborns within the U.S. National data set. This result in many term infants being incorrectly classified as preterm, creating a bimodal distribution to preterm birth weights within select gestational age windows. Use of clinical estimates of gestational age within the data set partially corrects this misrepresentation.

258 PYELONEPHRITIS & DOMESTIC VIOLENCE: ASSOCIATION FOUND. DC Crowood, AW Miller*, RC Bay*, LR Chanublis. Dept Ob/Gyn, Maricopa Medical Center, Phoenix, AZ.

OBJECTIVE: Domestic violence (DV) is a common and serious problem among pregnant women. DV has been associated specifically with preterm labor & abruptio placenta. We wished to assess the relationship between DV and other antepartum complications.

STUDY DESIGN: Research and nursing staff carried out a brief nurse and chart review of women delivering at Maricopa Medical Center (a county hospital serving Phoenix) over an 8-month period. The nurse, assessed acculturation, DV in the previous year, prenatal care, STD history, demographic information and outcomes related to antepartum complications. The frequencies of risk factors and outcomes were compared by calculating relative risks and 95% confidence intervals. Logistic regression was used to control for potential confounding. Analysis was restricted to the 1,025 Hispanic and 148 White non-Hispanic women who represented 92% of the deliveries.

RESULTS: Pyelonephritis occurred in 8.5% of victims of DV in the past year vs. 1.9% of those denying this history, RR 4.4, 95% CI 1.7-11. We controlled for potential confounders (demographic factors, parity, prenatal care (PNC), substance abuse, STD history) and other antepartum complications. Only preterm labor and substance abuse were found to be correlated with DV and the relative risk estimate changed only modestly. RR from logistic regression 3.6, 95% CI 1.2-10.6. Contrary to our expectations, those with DV did not present for prenatal care later in pregnancy; the mean EGA for PNC initiation was 17 weeks for both with and without DV.

CONCLUSIONS: In our study, DV in the last year was an independent risk factor for pyelonephritis. We theorized that victims of DV might present more frequently for prenatal care, which may have increased asymptomatic bacteriuria and present with pyelonephritis. The data did not support this conclusion. Our study is not the first to see an association between DV and UTI. A national cross-sectional study found that women who reported spouse abuse were almost twice as likely to have a history of UTI. Further investigation is needed to elucidate the mechanism behind this association. Immediate application of these findings can be made by practicing obstetricians in questioning women admitted with pyelonephritis about DV and making appropriate referrals.

259 URINARY INTERLEUKIN-8 AS A MARKER OF ASYMPTOMATIC BACTERIURI A IN PREGNANCY. S. Shelton, K. Kirvan*, E. Sedor*, W.N. Hertz, K. Bobbess. Dept. of Ob/Gyn and Pathology, Duke University Medical Center, Durham, NC.

OBJECTIVE: While urine culture is the gold standard for the diagnosis of asymptomatic bacteriuria (ASB), a turnaround time of at least 24 hours limits its value. The need for a sensitive, yet rapid test, persists. Urinary IL-8, an inflammatory cytokine, may soon be available as a rapid, simple test. We sought to compare the usefulness of urinary IL-8 with urine dipstick analysis in the prediction of ASB in pregnancy.

STUDY DESIGN: Clean-catch urine samples were obtained for ASB detection from 104 patients with urine cultures and IL-8 levels performed in all instances. Urine dipstick results for nitrites or leukocyte esterase (LE) were available for 65 patients. IL-8 assays were performed in batch using frozen aliquots. Urinary IL-8 concentrations were determined by chemiluminescence immunoassay.

RESULTS: Consistent with our patient population, 9 patients (8.7%) had positive urine cultures: E. coli 6, P. mirabilis 2, K. pneumoniae 1. The median IL-8 concentration was 455 pg/ml for patients with ASB and 107 pg/ml for those without ASB. A receiver-operator characteristic curve analysis resulted in an IL-8 level of 550 pg/ml as the optimal cutoff point.

CONCLUSION: Urinary IL-8 outperformed urine dipstick testing of nitrite/LE in identifying patients with ASB. Our data support the concept that IL-8 testing with an onsite technique may provide a useful tool for detecting ASB.
260 NEPHROLITHIASIS IN PREGNANCY. Erin Butler, Eric Eberts, Susan Cox, F. Gary Cunningham, Dept. Ob/Gyn, Univ. TX Southwestern Med. Ctr., Dallas, TX

OBJECTIVE: Renal sonography is reported to be helpful to confirm the diagnosis of nephrolithiasis. To ascertain the efficacy, we reviewed our experiences with nephrolithiasis complicating pregnancy and compared the radiographic test(s) used to confirm the diagnosis.

STUDY DESIGN: The outcomes of all pregnancies complicated by nephrolithiasis admitted to our hospital from 1986 to 1998 were evaluated.

RESULTS: A total of 47 women had 62 admissions for nephrolithiasis during pregnancy. Only 10 women had a prior history of nephrolithiasis. The average gestational age at diagnosis was 23 weeks. The most common presenting symptoms were flank pain and nausea. 68% had hematuria. While 80% of symptomatic episodes resolved with conservative management, 5 patients required ureteral stents, 2 percutaneous nephrostomy tubes, and 2 underwent ureteral laser lithotripsy. Radiographic tests utilized to confirm or diagnose nephrolithiasis are summarized below:

<table>
<thead>
<tr>
<th>No.</th>
<th>Positive</th>
<th>Negative</th>
<th>Sensitivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renal ultrasound</td>
<td>39</td>
<td>21</td>
<td>18</td>
</tr>
<tr>
<td>KUB</td>
<td>9</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>IVP</td>
<td>19</td>
<td>19</td>
<td>0</td>
</tr>
</tbody>
</table>

CONCLUSIONS: Nephrolithiasis complicating pregnancy had an incidence of 1 in 1500 in our institution. While ultrasound should be used initially to confirm the diagnosis of stone disease, its sensitivity was only 54%. If ultrasound findings are negative, then in our hands, IVP was the most sensitive diagnostic test.


OBJECTIVE: To determine the efficacy and safety of pre-operative administration of intravaginal metronidazole for the prevention of post-cesarean endometritis.

STUDY DESIGN: This double-blinded, randomized trial included patients at 42 weeks' gestation undergoing cesarean deliveries for various indications. Patients were randomized to receive either 5 grams of metronidazole gel intravaginally or matching placebo.

RESULTS: Of 31 patients receiving metronidazole, 2 (6%) developed post-cesarean endometritis compared to 9 of 32 (28%) patients receiving placebo gel (OR = 0.18, 95% CI 0.03 - 0.90; P = 0.04). In addition, patients in the placebo group appeared to have a more prolonged postpartum stay. No significant differences were noted between treatment groups with respect to febrile morbidity, wound infection, or antibiotic use.

CONCLUSIONS: The preoperative administration of intravaginal metronidazole gel appears to reduce the incidence of post-cesarean endometritis.

262 THE IMPACT OF INTRAPARTUM AMNIOPENFFUSION IN PATIENTS WITH MECONIUM-STAINED AMNIOTIC FLUID: A META-ANALYSIS. L. Sanchez-Ramos, FL. Gaudier, J. Pierce, Department of Obstetrics & Gynecology, University of Florida, Jacksonville, FL.

OBJECTIVE: To analyze published randomized trials assessing the efficacy of intrapartum amnioinfusion for patients with meconium-stained amniotic fluid.

STUDY DESIGN: Randomized clinical trials (RCTs) assessing the value of intrapartum amnioinfusions in patients with meconium-stained fluid were identified using electronic databases and references cited in original studies and review articles. We calculated an estimate of the odds ratio (OR) and risk difference for dichotomous outcomes using both random and fixed-effects models. Sensitivity analysis was performed and heterogeneity was assessed.

RESULTS: Thirteen studies which included 1924 patients (950 patients underwent amnioinfusion and 974 controls) met study criteria.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Amnioinfusion</th>
<th>Controls</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAS*</td>
<td>24/950 (2.5)</td>
<td>83/974 (8.5)</td>
<td>0.28 (0.17-0.45)</td>
</tr>
<tr>
<td>Cesarean</td>
<td>184/952 (19.7)</td>
<td>231/951 (24.3)</td>
<td>0.74 (0.58-0.93)</td>
</tr>
<tr>
<td>Acidemia</td>
<td>41/348 (11.6)</td>
<td>90/363 (24.8)</td>
<td>0.41 (0.27-0.62)</td>
</tr>
<tr>
<td>Endometritis</td>
<td>35/295 (11.2)</td>
<td>35/517 (10.4)</td>
<td>1.05 (0.60-1.81)</td>
</tr>
<tr>
<td>Fetal distress</td>
<td>38/361 (10.5)</td>
<td>75/369 (19.8)</td>
<td>0.46 (0.29-0.72)</td>
</tr>
<tr>
<td>Meconium below cords</td>
<td>27/553 (4.9)</td>
<td>132/576 (22.9)</td>
<td>0.16 (0.10-0.25)</td>
</tr>
</tbody>
</table>

* MAS = meconium aspiration syndrome. (%) OR Odds ratio

CONCLUSIONS: Amnioinfusion reduced the incidence of MAS and other adverse maternal and perinatal effects associated with meconium-stained fluid.

263 ZIDOVUDINE USE TO REDUCE PERINATAL HIV-1 TRANSMISSION: NORTHEAST FLORIDA EXPERIENCE. J. Dele, L. Sanchez-Ramos, C. Shaye Mora, Department of Obstetrics and Gynecology, University of Florida, Jacksonville, FL.

OBJECTIVE: To determine the acceptance of and effect of the implementation of the AIDS Clinical Trials Group Protocol 076 (ACTG 076) to reduce mother-to-infant transmission of human immunodeficiency virus (HIV) type 1 in Northeast Florida.

METHODS: This is a retrospective analysis of a cohort of 116 mothers with 124 pregnancies, and 126 infants (2 sets of twins) cared for, April 1, 1994 to December 31, 1997, after the implementation of ACTG 076. Demographic and clinical data recorded included: age, race, gestational age, history of drug abuse during pregnancy, CD4 T lymphocyte count, duration of rupture membranes, use of zidovudine therapy, mode of delivery, infant outcome, and HIV status of infant. These data were then compared to an existing database of 124 HIV infected mothers and 125 HIV-exposed/infected infants who delivered at same institution in the period preceding the implementation of ACTG 076.

RESULTS: Of 116 HIV-infected pregnant women who delivered during the study period, 114 (98%) were identified prenatally. One hundred of the women (86%) were African Americans with median age of 25. Forty-five women (39%) had a history of drug abuse during pregnancy. Zidovudine therapy was used antenatally in 113 of 124 pregnancies (91%), intrapartum in 107 of 124 (85%), and in 125 of 126 infants (99%). All three components of ZDV were received by 107 of 126 mother-infant pairs. Nineteen women (15%) did not receive the intrapartum ZDV regimen, 19 (15%) did not receive maternal ZDV during pregnancy, and 13 (11%) did not receive ZDV during the perinatal period.

CONCLUSIONS: Our results support and extend the findings of ACTG 076 protocol concerning the efficacy of ZDV use in reducing the maternal-infant HIV transmission rate and indicate that ZDV therapy is significantly effective outside the narrow limits of a controlled clinical trial.
264 VOLUNTARY INTRAPARTUM RAPID HIV TESTING FOR WOMEN WITHOUT ADEQUATE PRENATAL CARE: A DECISION ANALYSIS
WA Grobman*, PM Garcia. Department of Ob/Gyn, Northwestern University Medical School, Chicago, IL.
OBJECTIVE: To determine the health and economic consequences of instituting a nationwide policy of voluntary rapid testing for HIV during labor for those women who have received inadequate prenatal care.
STUDY DESIGN: A decision tree model was used to assess the number of pediatric HIV cases that would be averted if women who did not have the opportunity to discover their HIV serostatus during their prenatal care were offered an intrapartum voluntary rapid HIV test. This model postulated that perinatal transmission could be reduced both through the use of intrapartum and neonatal zidovudine, and through the reduced frequency of breastfeeding among women who know that they are HIV seropositive. Additional medical costs associated with the introduction of this policy were also determined. Probability and cost estimates entered into the model are based on data in the published literature. Literature search for useful base case, sensitivity analysis was performed to assess the impact of varying probability and cost variables.
RESULTS: Under base-case assumptions, a policy of intrapartum voluntary rapid HIV testing would result in 85 fewer cases of perinatal HIV transmission per year per 100,000 women without adequate prenatal care. Eighty percent of this reduction is due to the therapeutic benefit of short-course zidovudine, while 20% is due to decreased breastfeeding among women who are informed of their HIV seropositive status. The total cost savings to the medical system of this policy would be $89 million per year per 100,000 women without adequate prenatal care. The results of this model were most sensitive to estimates of HIV seroprevalence in the studied population, the reduction in transmission due to short-course zidovudine, the lifetime costs incurred by an infant after perinatal HIV transmission, and the extra costs incurred by a woman after early diagnosis of HIV infection. However, even the variables to which the model is most sensitive continue to yield cost savings across a wide range of values.
CONCLUSIONS: In the absence of adequate prenatal care, a voluntary rapid HIV test not only allows patients to fully explore their options with regard to testing and treatment, but also has the potential to provide significant health benefits to women and children and economic benefits to the medical system.

265 EFFECT OF HIV TESTING DURING PRENATAL CARE ON THE IDENTIFICATION OF PARTURIENTS WITH HIV INFECTION. N.M. Mossad*, C. Harris. Department of Obstetrics and Gynecology, University of Chicago, Chicago, Illinois
OBJECTIVE: The U.S. Public Health Service issued recommendations in 1994 that all pregnant women be offered testing for the HIV-1 antibody during prenatal care. We sought to determine if adherence to these guidelines improved HIV testing rates among women receiving prenatal care at our institution. Also, we evaluated whether this strategy of antenatal HIV testing identified all parturients with HIV infection at this hospital.
METHODS: Survey data from the MCH/HIV Integration Project was used to ascertain the proportion of prenatal patients at our clinics who were offered HIV testing, received education, accepted testing, and received results. All women who delivered infants at our hospital during Oct-Dec of 1995 and 1997 were interviewed. Those delivering in 1997 were compared to those delivering in 1995 using the Chi-square statistic. The seroprevalence of HIV-1 antibody among infants, which reflects HIV-1 infection among mothers, was determined using blood from heelsticks collected during December 1996.
RESULTS:

<table>
<thead>
<tr>
<th>Year</th>
<th>Test Offered</th>
<th>Received</th>
<th>Aware of Transmission</th>
<th>Aware of AZT</th>
<th>Accepted Testing</th>
<th>Y^2</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>276/377</td>
<td>155/276</td>
<td>134/155</td>
<td>115/166</td>
<td>201/377</td>
<td>5.86</td>
<td>&lt;.001</td>
</tr>
<tr>
<td></td>
<td>(73%)</td>
<td>(56%)</td>
<td>(86%)</td>
<td>(75%)</td>
<td>(55%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1997</td>
<td>242/275</td>
<td>231/242</td>
<td>219/231</td>
<td>158/231</td>
<td>222/275</td>
<td>2.16</td>
<td>.14</td>
</tr>
<tr>
<td></td>
<td>(88%)</td>
<td>(89%)</td>
<td>(89%)</td>
<td>(86%)</td>
<td>(81%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The seroprevalence of HIV-1 in the nursery was 0.6%. Given 5710 births during 1995-1996, the number of HIV-infected mothers is estimated to be 18 known HIV-infected women delivered at our hospital during that time.
CONCLUSIONS: From 1995-1997, the proportion of patients tested for HIV increased significantly. Despite >80% being tested, we identified only half of the HIV-infected women delivering at our institution using this strategy. Improved education regarding AZT prophylaxis may help to improve testing rates. Also, rapid HIV testing intrapartum could identify women at high risk for HIV infection who have not had testing but could benefit from AZT.

266 PRESENCE OF ABNORMAL VAGINAL FLORA ASSOCIATED WITH HIV-1 INFECTION IN PREGNANT WOMEN IN CENTRAL NORTH CAROLINA. R. Royce*, J. Thorp, Jr., J. Granados*, D. Savitz*, Depts. of Epidemiology and Ob/Gyn, Univ. of NC, Chapel Hill, NC.
OBJECTIVE: Sexually transmitted disease (STD) affects HIV-1 infection. In a cross-section of pregnant women we investigated whether abnormal vaginal flora might also be associated with HIV-1 infection after adjustment for potential confounders.
STUDY DESIGN: At baseline examinations of our prospective study of preterm delivery in North Carolina, USA, we recruited 724 women in prenatal care who provided vaginal swabs for gram stain scoring of vaginal flora and interview information. Vaginal flora scores were classified as normal, intermediate, and abnormal.
RESULTS: HIV-1 prevalence was 0.8% (4/489), 1.2% (1/84), and 3.2% (5/151) among women with normal, intermediate, and abnormal vaginal flora, respectively (p<.05). No HIV-1 infected woman had AIDS; all were on antiretroviral medication to prevent vertical transmission. Compared to women with normal vaginal flora, the relative risk for HIV-1 infection with intermediate flora was 1.5 (95% CI 0.2, 12.9), and abnormal flora was 4.0 (95% CI 1.1, 14.9). Adjustment for sexual activity, age, ethnicity, STDS, and douching did not alter the relationship.
CONCLUSION: In a population with a relatively low HIV-1 prevalence, vaginal flora abnormalities might be associated with prevalent infection. Although we cannot determine whether abnormalities in vaginal flora increase women's susceptibility to HIV-1 infection or become more common after infection, these abnormalities put HIV-1-infected pregnant women at increased risk for preterm delivery. Incidence studies are required to discern whether control of bacterial vaginosis might reduce the infectivity of HIV-1.

267 CLINICAL RISK SCORING SYSTEM FOR ANTENATAL BACTERIAL VAGINOSIS. L. Pastore*, J. Thorp, Jr., R. Royce*, T. Jackson*, D. Savitz*, Depts. of Epidemiology & Ob/Gyn, University of North Carolina at Chapel Hill, Chapel Hill, NC.
OBJECTIVE: Develop a clinical risk scoring system for screening pregnant women who are at increased risk of bacterial vaginosis (BV).
STUDY DESIGN: The Pregnancy, Infection and Nutrition Study, a NC cohort of pregnant women, collected genitai tract specimens, conducted interviews, and abstracted medical records. 915 women with last menstrual periods between January 30, 1995 and August 15, 1996, were eligible for this analysis. BV was evaluated by Nugent scoring, Gram stained vaginal smears between 24 and 29 weeks' gestation (scores of 7-10 considered positive).
RESULTS: Overall, 18.8% of women had BV. Logistic regression adjusted analyses found 7 out of 45 potential risk factors were predictive of BV. Risk of BV > 4.5 (adjusted odds ratio (AOR)=10.7, 95% CI 7.0,16.4), sickle cell hemoglobin (AOR=2.9, 95% CI 0.3, 27.2), smoking (AOR=2.1, 95% CI 1.3,3.5), African-American (AOR=2.0, 95% CI 1.3,5.0), preconception use of pregnancy (AOR=1.5, 95% CI 0.9,2.5), pre-pregnancy history of BV (AOR=1.5, 95% CI 0.7,3.7), and antenatal BV (AOR=1.3, 95% CI 0.8,3.8). The scoring system weights, based on the beta coefficients, range from 0 to 6. The sensitivity and specificity of screening women with total scores of 2 or higher for base risk and 5 or higher for additional risk were 9% and 95% respectively. Of the population to be tested, 4% of those screened would be expected to have BV. For scores of 5 or higher, the sensitivity and specificity were 77% and 75% respectively. 54% of the population would be tested, and 41% of those screened would be expected to truly have BV.
CONCLUSION: The scoring system identifies subgroups of women at increased risk of antenatal BV. Decision making to balance screening sensitivity and expense management can be determined by individual clinicians using this scoring system.
258 CHORIOAMNIONITIS, PREGNANCY OUTCOME, AND NEURO-DEVELOPMENTAL STATUS AT AGE FIVE YEARS, AR Goepfert, SP Cliver, J. Holtz, M. D'uhart of WW Andrews, RO Davis, RL Goldenberg, Dept. of Ob/Gyn, Univ. of Alabama at Birmingham, AL.

OBJECTIVE: To determine if histologic chorioamnionitis (HCA) is associated with preterm birth (PTB), fetal growth restriction (FGR) and/or neurodevelopmental status at age 5 years.

STUDY DESIGN: Histologic evaluation of the placenta was performed at birth in 756 singleton maternal/fetal pairs who participated in a prospective longitudinal study of pregnancy outcome. 520 children were evaluated at age 5 (including tests for IQ, motor function, and psychologic ability). HCA was determined based on neutrophilic infiltration in 10 sites including the chorioamnion, placenta basalis and cord. FGR was defined as < 15th percentile based on Alabama standards for race, sex, and parity.

RESULTS: Sixty infants were born at <34 weeks (wks), 93 at 34-36 wks, and 603 at ≥37 wks. 163 infants had FGR and 593 were AGA. Severe HCA was more common in black vs. white women (18% vs. 11%, p<0.02), but was not influenced by maternal age or educational level. The mean gestational age (GA) at delivery was significantly lower in women with vs. those without severe HCA (34.6±3 wks vs. 38.3±3 wks, p<0.0001). Severe HCA was inversely proportional to delivery GA; 12% at <34 wks, 10% at 34-36 wks and 6% at ≥37 wks (p=0.001). After adjusting for race, prior PTB and other risk factors, severe HCA was significantly associated with PTB at <34 wks [OR 9.98 (4.9-20.4)] but not at ≥34-36 wks. HCA was not associated with FGR. The mean IQ score at age 5 was not related to the presence of HCA (80.8±12 vs. 82 ±12, p=2). Most measures of neurodevelopmental function at age 5 were not associated with HCA. However, in term black infants, both language ability and IQ (78.0±13 vs. 82.3±9, p=0.05) were lower when HCA was present at birth. Incidence rates of adverse perinatal outcomes (IVH, HDS, NEC) were available to correlate with HCA and there were no cases of cerebral palsy in this population.

CONCLUSION: HCA is more common in black women, is associated with lower delivery gestational age, but is not associated with FGR. In this population, in black infants born at term, HCA is associated with a small decrease in IQ at 5 years of age.

259 CHORIOAMNIONITIS IS ASSOCIATED WITH PROLONGED INTRAUTERINE FETAL HYPOXIA MEASURED BY UMBILICAL CORD BLOOD ERYTHROPOIETIN (EPO). A. Jazayeri, W. Spellacy, Depart. of Ob/Gyn, LSUMC, Shreveport and Univ. of South Florida, Tampa.

OBJECTIVE: To determine if clinical chorioamnionitis (CHORIO) was associated with intrauterine fetal hypoxia as measured by umbilical cord blood EPO.

STUDY DESIGN: Two hundred and twenty eight samples were analyzed. Cord blood was needle aspirated and spun to separate the plasma, which was then frozen until analysis. EPO levels (mIU/mL) were measured using an ELISA kit from R&D Systems (Minneapolis, MN). Statistical analyses were done by independent t-test, ANOVA, multiple linear regressions and univariate analysis of variance using SPSS statistical package. Probability values less than 0.05 were considered significant.

RESULTS: Fetal plasma EPO (mean±SEM) was elevated in pregnancies with the clinical diagnosis of CHORIO (138±25, n=19) compared to controls (25±2.0, p<0.001). Stepwise multiple regression analysis using CHORIO, IUGR, meconium passage, smoking, decreased long term variability (LTV), and variable decelerations in labor showed only CHORIO (p=0.012), meconium (p=0.001) and decreased LTV (p=0.001) to be associated with EPO levels. Univariate analysis of variance CHORIO showed decreased LTV to be independently associated with elevated EPO.

CONCLUSIONS: CHORIO is a marker for chronic fetal hypoxia and is known to be elevated in pregnancies complicated by meconium passage and abnormal fetal heart rate. An association between cerebral palsy (CP) and chorioamnionitis has been reported. Our data show elevated fetal EPO in CHORIO and thus support the hypothesis that the cause for the observed association between CP and chorioamnionitis is chronic fetal hypoxia.

260 ANTIBIOTIC ADMINISTRATION IN PATIENTS WITH PRETERM PREMATURE RUPTURE OF MEMBRANES REDUCES THE RATE OF HISTOLOGICAL CHORIOAMNIONITIS: A RANDOMIZED STUDY. A. Ovalle, M.A. Martinez, E. Rakaciea, R. Rubin, O. Valderrama, E. Villablancas, A. Fuentes, J. Saez, R. Gomez, Dept. of Ob/Gyn, San Borja Artilaria Hospital; Dept. of Microbiology, University of Chile; and Dept. of Ob/Gyn, Sotero del Rio Hospital, P. Universidad Catolica de Chile, Santiago, Chile.

OBJECTIVE: To determine whether antibiotic administration in patients with preterm premature rupture of membranes (PROM) is associated with a reduction in the rate of histologic chorioamnionitis.

STUDY DESIGN: One hundred consecutive patients with preterm PROM and no labor between 24 and 34 weeks were invited to participate in this study. Eligible patients randomly received either cefazolin-gentamycin for 7 days or placebo, and were managed expectantly until 35 weeks unless fetal or maternal indications developed. Microbial invasion of the amniotic cavity (MIAC) was defined as the presence of a positive amniotic fluid culture obtained by transabdominal amniocentesis. Cervicovaginal infection (CVI) was diagnosed when bacterial vaginosis or a positive culture for cervicovaginal pathogens or facultative bacteria associated with a significant increase in the white blood cell count were found. Histologic chorioamnionitis was based on the polymorphonuclear leukocyte infiltration of the chorionic plate or the extraplacental fetal membranes.

RESULTS: Seventy-one patients with available histological study of the placenta were included. The effects of antibiotics on placental histology are denoted in the following table:

<table>
<thead>
<tr>
<th>Setting</th>
<th>Antibiotics</th>
<th>Placebo</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>All cases</td>
<td>16/25 (65%)</td>
<td>25/36 (69.4%)</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>MIAC or CVI</td>
<td>15/26 (57.7%)</td>
<td>24/27 (88.9%)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>No MIAC, No CVI</td>
<td>1/9 (11.1%)</td>
<td>1/9 (11.1%)</td>
<td>NS</td>
</tr>
</tbody>
</table>

CONCLUSION: Administration of antibiotics in patients with preterm PROM is associated with a significant reduction in the incidence of histologic chorioamnionitis.

270 ASSOCIATION BETWEEN INTERLEUKIN-6 IN UMBILICAL VENOUS CORD BLOOD AND HISTOLOGIC FUNISITIS. N. Subbar, MD, Mahmoud Ismail, MD, Anthony Montag, MD, Robert Mittendorf, MD, Lynn Bentz, RN, BSN, RO Hinson, MD, University of Chicago, Chicago, IL. Uniformed Services, University of the Health Sciences, Bethesda, MD.

OBJECTIVE: To determine whether or not the presence of the inflammatory cytokine, interleukin-6 (IL-6), is associated with funisitis, an important histologic finding in severe umbilical cord and placental infection.

STUDY DESIGN: Ninety-four pregnant patients were admitted to the Labor and Delivery Unit at the Chicago Lying-in Hospital between 10/27/95 and 1/7/97 with preterm labor at estimated gestational age 24-34 completed weeks and estimated fetal weight < 2000 gm by ultrasound. Six patients with twin gestations were included. Venous umbilical cord blood samples were collected at the time of delivery. Levels of IL-6 were measured by the standard commercial enzyme-linked immunosorbent assay. Values ≥ 10 pg/ml were considered elevated. All but 8 placenta underwent primary review and the diagnosis of funisitis was confirmed by a perinatal pathologist on secondary review.

RESULTS: A total of 92 umbilical cords and placentae were examined by blinded pathologists. The histologic findings were compared to the corresponding IL-6 values in venous umbilical cord blood. A statistically significant association was found between elevated venous cord IL-6, as defined, and confirmed histologic funisitis. Elevated IL-6 values were found in 14/15 (93%) patients with histologic funisitis vs. 25/77 (33%) patients without evidence of funisitis (p<0.001). Two-sided Fisher exact test.

CONCLUSION: There is a statistically significant association between elevated levels of IL-6 in venous umbilical cord blood and confirmed histologic funisitis. This suggests that funisitis can be predicted by measuring IL-6 in venous umbilical cord blood at the time of delivery and that biochemical markers may be used to detect infectious processes in the placenta.

OBJECTIVE: To investigate the efficacy of intrapartum vaginal flushings with chlorhexidine (CLX) in preventing Group B streptococcus (GBS) transmission to neonates.

STUDY DESIGN: Randomized controlled study. Only singleton pregnancy delivering vaginally were included. One hundred thirty-nine GBS colonized mothers at term (screened at 36-38wks) were randomized to receive either 140 ml CLX (0.2%) by vaginal flushings every 6hrs or Ampicillin (AMP) 2 grams IV/8hrs until delivery. Neonatal swabs were taken at birth, in 5 different sites (nasal, ear and gastric juice).

RESULTS: Seventy women were treated with AMP while 69 with CLX. Neonatal transmission was similar in the two groups (Table). No adverse reactions were recorded in the two groups.

<table>
<thead>
<tr>
<th>AMP (70 cases)</th>
<th>CLX (69 cases)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yrs)</td>
<td></td>
</tr>
<tr>
<td>30.8 ± 5</td>
<td>30.8 ± 3.2</td>
</tr>
<tr>
<td>Delivery (wks)</td>
<td></td>
</tr>
<tr>
<td>39.7 ± 1.1</td>
<td>39.9 ± 1.1</td>
</tr>
<tr>
<td>Birthweight (gr)</td>
<td></td>
</tr>
<tr>
<td>3390 ± 367</td>
<td>3430 ± 471</td>
</tr>
<tr>
<td>Risk factors (+) (n°)</td>
<td></td>
</tr>
<tr>
<td>17 (24%)</td>
<td>13 (19%)</td>
</tr>
<tr>
<td>Neumates with GBS (n°)</td>
<td></td>
</tr>
<tr>
<td>7 (10%)</td>
<td>8 (12%)</td>
</tr>
<tr>
<td>GBS at 3 sites (n°)</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1 (2%)</td>
</tr>
<tr>
<td>Neonatal sepsis (n°)</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*PROM >12hrs, labor >8hrs, temp. >38°C

CONCLUSIONS: Intrapartum vaginal flushings with CLX in colonized mothers show the same efficacy of AMP in preventing GBS vertical transmission of GBS. These data allow to evaluate such treatment in a larger multicentre trial in order to reach definite conclusions.

274 GROUP B STREP AT GRADY MEMORIAL HOSPITAL: A RETROSPECTIVE EVALUATION. M. Cameron, T. Feng, B. Raynor. Dept. Gyn/Ob, Emory University, Atlanta, GA.

OBJECTIVE: The CDC recommends intrapartum chemoprophylaxis to minimize maternal to fetal Group B Streptococcal transmission and two protocols are considered appropriate. The first protocol recommends that all pregnant women be screened at 35-37 weeks for anogenital GBS colonization. The second protocol recommends intrapartum antibiotics based on maternal risk factors (i.e. delivery <37 weeks gestation, ROM > 18 hours; intrapartum T ≥ 38°; previous child affected by GBS infection, GBS bacteriuria). In September 1994, a risk-factor based protocol for the prevention of early onset GBS disease was enacted. The purpose of this study is to evaluate the impact this protocol had on the incidence of early-onset GBS disease and to assess its efficacy as a prevention strategy. A secondary objective will be to evaluate problems associated with the protocol.

STUDY DESIGN: Between 1990 and 1997, all positive blood cultures and cerebrospinal fluid cultures in neonates < 7 days of age were identified at the laboratory computer system. The corresponding neonatal and maternal medical record numbers were also identified and the medical records for mothers and neonates delivering after the implementation of the protocol in September 1994 were reviewed.

RESULTS: Fifty-three infants were born with early-onset GBS disease; of these, only 42 of the 53 maternal records were available for review. Of the 42 mothers, 25 (60%) had risk factors. Of the 25 mothers with risk factors, 18 (72%) received intrapartum antibiotics, 7 (28%) should have but did not. None of the 53 infants died.

CONCLUSION: The 1997 incidence of 2.4 per 1,000 live births reflects a 48% decrease from the average annual incidence of early-onset GBS disease occurring before September 1994. The protocol failure rate was 18/25 (72%) and the protocol violation rate was 7/28 (28%). Further study is needed to identify and correct factors associated with protocol violations and failures when using a risk-factor based protocol.


OBJECTIVE: Emerging antibiotic resistance among GBS strains has been reported. We sought to determine the incidence of antibiotic resistance in our inner-city Hispanic population and evaluate peripartum infection morbidity from resistant strains.

STUDY DESIGN: All GBS isolates identified by the University Hospital laboratory from March, 1998 to the present were analyzed for sensitivity to penicillin G, ampicillin, clindamycin, erythromycin, and cephalexin utilizing disk diffusion and minimal inhibitory concentration (MIC) by serial dilution. Resistance was defined by standard criteria. Maternal and neonatal outcome data were obtained upon delivery.

RESULTS: 120 GBS isolates have been analyzed thus far, with no isolate found to be resistant to penicillin G, ampicillin or cephalexin by either technique. Clindamycin resistance was identified in 5 isolates (2.5%) in both disk diffusion and MIC. Erythromycin resistance was noted in 12 isolates by disk diffusion and 15 isolates by MIC for a total of 14 isolates (12%) with evidence of erythromycin resistance. Overall, 14 of the 19 isolates (12%) had evidence of antibiotic resistance (all clindamycin resistant isolates were also erythromycin resistant). Resistance was identified in both genital (10/85, 12%), and urinary (4/35, 11%) isolates. We have not yet identified neonatal sepsis due to failure of antibiotic prophylaxis in cases with resistant GBS (intraamniotic infection with previable delivery was noted in one case).

CONCLUSIONS: Resistance to clindamycin and/or erythromycin can be identified in GBS isolates from pregnant women. Clindamycin use for GBS prophylaxis may provide inadequate coverage. Alternative prophylaxis schemes should be considered for penicillin-allergic women.
276 GENOMIC CHARACTERIZATION OF VAGINAL GROUP B BETA-HEMOLYTIC STREPTOCOCCI BY PULSED-FIELD GEL ELECTROPHORESIS. K. D. Benson, H. J. Willenberg, A. J. Deignans, J. M. Thorner, J. L. Luchansky, I. H. Kay. Deps. of Ob/Gyn, Pathology, and Food Research Institute, Univ. of Wisconsin, Madison, WI.

OBJECTIVE: Management protocols for vaginal group B beta-hemolytic streptococci (GBS) infection during pregnancy focus on treatment after infection is identified. There is more to be learned about the epidemiology of these infections. In this study, we investigated field-pulse gel electrophoresis of GBS strains from pregnant patients to further characterize clinically recovered organisms.

STUDY DESIGN: Vaginal strains of GBS were recovered from 9 pregnant patients (3 preterm labor, 4 preterm premature rupture of membranes, 2 antenatal screening) in the third trimester in standard fashion and grown on selective Todd Hewitt broth. Isolates were molecularly characterized by contour clamped homogeneous electric field (CHEF) pulse field gel electrophoresis (CHEF/PFGE) with the rate cutting restriction enzyme XbaI.

RESULTS: Analyses by CHEF/PFGE revealed that the 9 strains displayed 7 distinct genomic fingerprint profiles. Two isolates were indistinguishable and very similar in clonality to a third isolate. Clinical data did not reveal shared sources for these 3 patients or for the other 6 patients suggesting there may be a limited number of clonal types responsible for the majority of clinical infections.

CONCLUSIONS: We conclude that CHEF pulse-field gel electrophoresis is an efficient, reproducible, and highly discriminatory method for subtyping GBS and will be a valuable tool for epidemiologic studies of GBS infection during pregnancy.

277 ANTIBIOTIC CHEMOPROPHYLAXIS FOR GROUP B STREP IS NOT NECESSARY WITH ELECTIVE CESAREAN SECTION AT TERM. R. M. Ramus, D. D. McIntire, G. D. Wendel, Jr. Dept. Ob/Gyn, Univ. Texas Southwestern Medical Center, Dallas, TX.

OBJECTIVE: Neonatal early onset group B strep (GBS) infection is the result of perinatal transmission in women colonized with the organism. Presently two different strategies (risk based, or culture based) are recommended to prevent GBS infection. This study was performed to determine the incidence of GBS in a large population of women delivered at term by elective cesarean section (C/S) that did not receive antibiotic chemoprophylaxis.

STUDY DESIGN: Obstetrical database at Parkland Memorial Hospital was analyzed from 1988 to 1997 to identify women that underwent elective C/S. Exclusion criteria included the presence of labor, cervix > 4 cm dilated, ruptured membranes, or gestational age < 37 weeks. A risk based approach for GBS chemoprophylaxis was utilized, so none of the patients in this study received prophylactic antibiotics. Confidence intervals were calculated by the binomial distribution.

RESULTS: Over the study period 143,639 deliveries were performed; 3,546 (2.5%) met criteria. A total of 3,590 infants were delivered. There was one infant with culture proven sepsis in the nursery (nosocomial infection) by methicillin resistant Staph. aureus, and two neonatal deaths. Thirty infants were diagnosed with pneumonia; 19 required supplemental oxygen while receiving therapy. None of these infants were found to have GBS (95% CI 0.0 - 0.1%). Using the colonization rate in our population we would expect approximately 539 (15%) of these women undergoing elective C/S to be GBS carriers. Therefore the observed attack rate in colonized women was 0.0% (95% CI 0.0 - 0.7%).

CONCLUSIONS: In a large population of women at term undergoing elective C/S we were unable to demonstrate any GBS infection or associated morbidity. These data suggest that patients do not require chemoprophylaxis at the time of elective C/S.

<table>
<thead>
<tr>
<th>Type of Delivery</th>
<th>Primary</th>
<th>Secondary</th>
<th>Early latent</th>
<th>Unknown duration</th>
<th>Late latent</th>
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<tr>
<td>Stillbirth</td>
<td>n=35</td>
<td>n=65</td>
<td>n=177</td>
<td>n=111</td>
<td>n=40</td>
</tr>
<tr>
<td></td>
<td>1 (3)</td>
<td>13 (20)</td>
<td>30 (17)</td>
<td>4 (4)</td>
<td>2 (5)</td>
</tr>
<tr>
<td>Liveborn</td>
<td>9 (26)</td>
<td>25 (39)</td>
<td>58 (33)</td>
<td>28 (25)</td>
<td>3 (8)</td>
</tr>
<tr>
<td>Total</td>
<td>10 (25)</td>
<td>38 (56)</td>
<td>88 (50)</td>
<td>32 (30)</td>
<td>5 (13)</td>
</tr>
</tbody>
</table>

Reported as n (%).

CONCLUSIONS: Unretracted maternal group B strep continues to cause significant adverse pregnancy outcomes and neonatal morbidity with high rates of stillbirths and congenital infection. Early stage disease has the highest transmission rates possibly secondary to higher maternal spirochetalemia. These findings support the need for prenatal care, serologic screening and treatment to prevent adverse outcomes.


OBJECTIVE: To describe the relationship between untreated maternal syphilis and perinatal transmission according to clinical stage at delivery.

STUDY DESIGN: Prospective cohort analysis from Jan. 1, 1988 to July 1, 1998. Women delivered with a reactive serology for syphilis and who had received no prior treatment were evaluated and clinically staged by one investigator. Infants had physical examination, long bone radiographs, and laboratory testing (CSE, CBC with platelets) performed. In addition, infants had specific IgM immunoblotting, PCR and/or rabbit infectivity testing for T. pallidum. Congenital syphilis was diagnosed if any part of the evaluation or autopsy findings were abnormal.

RESULTS: 428 women were identified over the 10 year study period. Overall, 174 (41%) liveborn and stillborn infants had evidence of congenital syphilis. The rates of congenital syphilis were higher for early syphilis (156 of 277; 49%) compared to late syphilis (37 of 151; 25%).

<table>
<thead>
<tr>
<th>Type of Syphilis</th>
<th>Early Syphilis</th>
<th>Late Syphilis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Primary</td>
<td>Secondary</td>
</tr>
<tr>
<td></td>
<td>n=35</td>
<td>n=65</td>
</tr>
<tr>
<td>Stillbirth</td>
<td>1 (3)</td>
<td>13 (20)</td>
</tr>
<tr>
<td>Liveborn</td>
<td>9 (26)</td>
<td>25 (39)</td>
</tr>
<tr>
<td>Total</td>
<td>10 (25)</td>
<td>38 (56)</td>
</tr>
</tbody>
</table>

279 DIAGNOSIS OF CONGENITAL TOXOPLASMOSIS IN THE NEONATAL PERIOD: A MULTICENTER STUDY. A. Nasertorp, A. Pollak, M. Lappalainen, B. Skar Pedersen, J. M. Pinzon, A. Decoster, E. Petersen, W. Foulong. Free University Brussels, University of Vienna, University of Helsinki, University of Oslo, University of Reims, University of Lille, Statens Serum Institute Copenhagen.

OBJECTIVE: To evaluate different laboratory parameters to diagnose children with congenital toxoplasmosis (CT) in the neonatal period.

STUDY DESIGN: Data from 294 patients with a proven seroconversion for Toxoplasma gondii during pregnancy were analyzed in a retrospective multicenter study. The following parameters were evaluated to diagnose CT: IgM and IgA antibodies in cord blood and in neonatal blood and cultures for the parasite in placenta and in cord blood. Definite diagnosis of CT was defined as the persistence of IgG in the child at 1 year of age.

RESULTS: 93 out of the 294 children were found to be congenitally infected. Sensitivity, specificity, positive and negative predictive value are summarized in the table.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>SE</th>
<th>SP</th>
<th>PPV</th>
<th>NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Placenta culture</td>
<td>44.8</td>
<td>100</td>
<td>100</td>
<td>78.4</td>
</tr>
<tr>
<td>Cord blood culture</td>
<td>44.8</td>
<td>100</td>
<td>100</td>
<td>62.5</td>
</tr>
<tr>
<td>Cord blood IgM</td>
<td>41.2</td>
<td>96.2</td>
<td>84.8</td>
<td>75.8</td>
</tr>
<tr>
<td>Cord blood IgA</td>
<td>63.8</td>
<td>91.8</td>
<td>85.7</td>
<td>76.7</td>
</tr>
<tr>
<td>Neonatal cord IgM</td>
<td>43</td>
<td>99.3</td>
<td>97.4</td>
<td>76.7</td>
</tr>
<tr>
<td>Neonatal cord IgA</td>
<td>85.6</td>
<td>99</td>
<td>97.7</td>
<td>82.5</td>
</tr>
</tbody>
</table>

CONCLUSION: Cultures of the placenta and of cord blood are less sensitive parameters for early diagnosis of CT than the serological markers; they have, however, a specificity of 100%. Within the serological parameters we found IgA to be more sensitive than IgM. Cord blood serology is more subjected to false positive results than neonatal blood.

OBJECTIVE: To evaluate the role of cell-mediated immunity in the maternal-fetal transmission of Toxoplasma gondii.

STUDY DESIGN: Seventeen pregnant women with primary T. gondii infection, in seven of whom fetal infection occurred, were subjects of this study. Eighteen healthy pregnant women were followed-up as controls.

RESULTS: Fetal infection occurred in 35% of women (17/49), while 65% were non-transmitters. In the mothers transmitting T. gondii to the fetus compared to non-transmitters and controls both in the number of NK (NK) cells in the mothers transmitting T. gondii to the fetus was significantly lower level of natural killer (NK) cells in the mothers transmitting T. gondii to the fetus compared to non-transmitters and controls both in the number of NK (NK) cells in the mothers transmitting T. gondii to the fetus.

CONCLUSIONS: Although limited by the small number of patients, our data suggest that the assessment of NK cells may be considered as a prognostic marker of primary T. gondii infection in pregnancy.


OBJECTIVE: To investigate the relationship between genital Ureaplasma urealyticum (Uu) in pregnancy and adverse neonatal outcome.

STUDY DESIGN: Data was retrospectively collected from all patients with preterm birth associated with preterm premature rupture of membranes (PPROM) or preterm labor (PTL) between 1/93 and 12/97. Maternal data included indication for and gestational age (GA) at admission, Uu and other genital culture results, amniotic fluid culture results and indication for delivery. Neonatal data included GA and weight at birth, Apgar scores, endotracheal Uu culture result, bronchopulmonary dysplasia (BPD), days in NICU, and discharge survival. Placental histology was reviewed. Statistical analysis included Student t test and Z^2, with p<.05 considered significant.

RESULTS: Thirty-two percent (19/59) of patients had an AFI of <5 cm. patients with preterm birth had higher median AF MMP-8 concentrations than those with no labor (median 16.4 ng/ml range 0.06-1040 ng/ml vs. no labor median 3.5 ng/ml range 0.06-38 ng/ml; p<0.005). Patients with PTL leading to preterm birth had higher median AF MMP-8 concentrations than those with PTL who delivered a term (median 33.3 ng/ml range 0.12-1650 ng/ml vs. median 3.9 ng/ml range 0.06-520.9 ng/ml; p<0.05). Intraamniotic infection in women with both intact membranes and rupture of membranes was associated with a higher median AF MMP-8 concentration than those with similar clinical conditions but sterile AF. The meaning of low levels of natural killer (NK) cells in the placenta is discussed.

CONCLUSIONS: 1) Preterm PROM, parturition (term and preterm) and intrauterine infection are associated with a significant increase in the bioavailability of neutrophil elastase; and 2) MMP-8 may play a role in preterm PROM.


OBJECTIVE: The mechanisms by which intrauterine infection leads to membrane weakening and rupture are poorly understood. Matrix metalloproteinases (MMPs), a family of potent enzymes that degrade components of the extracellular matrix, have been implicated in rupture of membranes.

STUDY DESIGN: A cross-sectional study was designed with women in the following categories: 1) midtrimester (n=25); 2) preterm PROM in the presence and absence of intraamniotic infection (n=25); 3) preterm labor (PTL) in the presence and absence of intrauterine infection (n=63); 4) term in the presence and absence of labor (n=50); and 5) term PROM (n=49). AF was collected by transabdominal amniocentesis. AF MMP-8 concentrations were determined using a sensitive and specific immunoassay (R&D Systems).

RESULTS: 1) Women with preterm PROM in the absence of infection had significantly higher AF MMP-8 concentrations than those with PTL and intact membranes who delivered at term (preterm PROM median 31.6 ng/ml; range 0.06-1040 ng/ml vs. PTL median 15.75 ng/ml; range 0.06-320.9 ng/ml; p<0.05); 2) Women in labor at term had higher median AF MMP-8 concentrations than those not in labor (median 16.4 ng/ml; range 0.33-362 ng/ml vs. no lab median 3.5 ng/ml range 0.06-38 ng/ml; p<0.005); 3) Patients with PTL leading to preterm birth had higher median AF MMP-8 concentrations than those with PTL who delivered a term (median 33.3 ng/ml range 0.12-1650 ng/ml vs. median 3.9 ng/ml range 0.06-520.9 ng/ml; p<0.05); 4) Intraamniotic infection in women with both intact membranes and rupture of membranes was associated with a higher median AF MMP-8 concentration than those with similar clinical conditions but sterile AF.

CONCLUSIONS: 1) Preterm PROM, parturition (term and preterm) and intrauterine infection are associated with a significant increase in the bioavailability of neutrophil elastase; and 2) MMP-8 may play a role in preterm PROM.


OBJECTIVE: To determine whether oligohydramnios in preterm premature rupture of membranes (PROM) is associated with evidence of fetal, maternal and intraamniotic inflammatory response or the presence of fetal acidemia.

STUDY DESIGN: Amniotic fluid index (AFI) was measured before amniocenteses in patients with preterm PROM. Fifty-nine patients who delivered preterm newborns (gestational age<35 weeks) within 5 days of amniocenteses were evaluated. Amniotic, Af (AF) was cultured for aerobic and anaerobic bacteria as well as mycoplasmas. The intensity of the inflammatory response was evaluated by AF concentrations of interleukin-6 (IL-6), interleukin-1 beta (IL-1b), tumor necrosis factor-alpha (TNF-alpha), AF white blood cell (WBC) count, histologic choirotamnionitis, and IL-6 concentrations of umbilical cord plasma at birth. Cytokines were measured by specific immunoassays.

RESULTS: Thirty-two percent (19/59) of patients had an AFI of ≤5 cm. Patients with an AFI of ≤5 cm had evidence of an intrauterine inflammatory response in the amniotic, maternal and fetal compartments more frequently than those with an AFI > 5 cm (see table). However, oligohydramnios was not associated with fetal acidemia.

CONCLUSION: Oligohydramnios in preterm PROM is associated with an inflammatory response in the fetal, amniotic and maternal compartments.
### 246 EXPECTANT MANAGEMENT OF PPROM: THE RELATIONSHIP BETWEEN CORD BLOOD GASES AND CHORIOAMNIONITIS. E.T. McKenna, for the NICHD MFMU Network, Bethesda, MD.

**OBJECTIVE:** To correlate the relationship between clinical chorioamnionitis, neonatal sepsis and cord blood gases during expectant management of preterm premature rupture of membranes at 24-32 weeks gestation.

**STUDY DESIGN:** We analyzed data from 403 pregnancies complicated by PPROM at ≥24-32 weeks gestation who were enrolled in a multicenter, placebo-controlled trial of pregnancy prolongation using antibiotic therapy. Patients assigned to antibiotics were to receive 2 days of intravenous ampicillin and erythromycin followed by 5 days of oral amoxicillin and erythromycin. Baseline maternal and neonatal demographics, obstetric history, gestational age, parity and race between the two groups. The mean AF sFas levels were positively correlated with AF neutrophil counts, and negatively correlated with AF glucose (r = -0.34, p = 0.03; and r = -0.37, p = 0.02, respectively).

**RESULTS:** There were no significant differences in maternal age, gestational age, parity and race between patients with and without IAI. The mean level of AF sNucleosome was significantly higher in IAI than that of without IAI (p = 0.036). The mean level of AF sNucleosome was significantly higher in IAI than that of without IAI (5.0 ± 0.8 vs. 2.0 ± 0.3 pg/ml, p = 0.0001). AF sFas levels were positively correlated with AF leukocytes, and creatinine (Cr) were negatively correlated with AF glucose levels.

**CONCLUSIONS:** Although it is unclear how the production or secretion of sFNucleosomes in AF, leukocytes may be one of the sources for these findings. Measurements of AF sFNucleosomes may be of diagnostic, prognostic or pathogenic importance in IAI.

<table>
<thead>
<tr>
<th>Value*</th>
<th>Amnionitis</th>
<th>No Amnionitis</th>
</tr>
</thead>
<tbody>
<tr>
<td>P Value*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arterial pH</td>
<td>7.25 ± 0.08</td>
<td>7.29 ± 0.10</td>
</tr>
<tr>
<td>Venous pH</td>
<td>7.33 ± 0.07</td>
<td>7.3 ± 0.08</td>
</tr>
<tr>
<td>Arterial pCO₂</td>
<td>50.27 ± 12.8</td>
<td>42.72 ± 13.93</td>
</tr>
</tbody>
</table>

*Adjusted for use of antibiotics and GBS culture at randomization.

Using regression analysis to control for antibiotic use and GBS status, a significant correlation between arterial pH and gestational age at delivery (p = 0.002) was observed. A similar correlation was present between arterial pCO₂ and Apgar scores at 1 and 5 minutes (p = 0.0001). After normalizing to AF Cr, IAI also had significantly higher mean sFas than that of without IAI (5.0 ± 0.8 vs. 2.0 ± 0.3 pg/ml, p = 0.0001). AF sFas and sFas/Cr were positively correlated with AF leukocytes (r = 0.65, p = 0.0001) and negatively correlated with AF glucose (r = -0.34, p = 0.02; and r = -0.37, p = 0.02, respectively).

**CONCLUSIONS:** Although it is unclear how the production or secretion of sFas into amniotic fluid, leukocytes may be one of the sources for these findings. Measurements of sFas in AF may be of diagnostic and prognostic importance and further investigation.

OBIETIVE: To determine incidence of multi-drug resistant isolates in neonates exposed to antibiotic prophylaxis used in expectant management of preterm premature rupture of membranes (PPROM).

METHODS: All pregnant women and their offspring delivered between 1990-97 with PPROM were identified. Maternal and neonatal medical records were reviewed for data including latency period, number, type, and duration of antenatal antibiotic administration; results of neonatal cultures and sensitivities; duration of postnatal antibiotic therapy; and survival. Antibiotic regimens including azithromycin and/or piperacillin were defined as extended-spectrum antibiotics (ESA). Categorical variables were analyzed by Fisher's exact test and continuous variables were compared by t-test.

RESULTS: 24 gravidas with 24 offspring with PPROM occurring between 18-35 weeks were reviewed. Median birthweight and EGA at delivery were 1842g and 32 weeks, respectively. All received at least one prophylactic antibiotic; 82% pregnancies were exposed to 2 or more drugs. 83% women received antenatal corticosteroid prophylaxis. At least one organism was isolated in 99% of neonates. 6/24 infants grew out bacteria that demonstrated multi-drug resistance, eg. piperacillin, ciprofloxacin, and oxacillin. The use of ESA was associated with a moderate increase in latency period (6 vs. 13 days, p=0.06), but also with increased neonatal isolation of drug-resistant bacteria (Fisher's p=0.05). Two neonates expired from sepsis (EGA of 24 and 34 weeks).

CONCLUSIONS: The use of ESA in PPROM is associated with isolation of multi-drug resistant organisms in the neonatal period and should be used with caution in older pregnancies in which the benefit of prolonging latency may not outweigh the complication of sepsis from drug resistant organisms.
292 AMNIOTIC FLUID MMP-9 AND TIMP-1 CONCENTRATIONS THROUGHOUT PREGNANCY AND LABOR. G. Locksmith, P. Clark, P. Duff, G. Saade. Deps. Ob/Gyn, Univ. of Florida, Gainesville, Florida and Univ. of Texas Medical Branch, Galveston, Texas.

OBJECTIVE: Matrix metalloproteinases (MMPs) are important groups of enzymes responsible for the degradation of collagen and other extracellular matrix components found in the cervix and fetal membranes. The tissue inhibitors of metalloproteinases (TIMPs) regulate proteolysis by forming complexes with MMPs with equimolar stoichiometry. We aimed to characterize relationships between amniotic fluid (AF) concentrations of MMP-9 and principal inhibitor (TIMP-1), and various maternal factors.

STUDY DESIGN: In this prospective, observational study, we collected AF samples from 109 women at various stages of pregnancy and labor and determined MMP-9 and TIMP-1 concentrations using commercial ELISA systems. We evaluated associations between AF MMP-9 and AF TIMP-1 concentrations and the following factors: gestational age, presence of labor (induced and spontaneous), cervical dilation, occurrence of spontaneous or artificial rupture of membranes, presence of clinical chorioamnionitis, and colonization of the amniotic fluid with aerobes, anaerobes, or mycoplasmas.

RESULTS: In women who were not in labor, had intact membranes, and had no evidence of chorioamnionitis, AF MMP-9 levels were undetectable in the second trimester at full-term. In a multivariate analysis, clinical chorioamnionitis and cervical dilation were independently associated with elevated AF MMP-9. Microbial colonization of the AF replaced chorioamnionitis in a separate multivariate model and also was associated with elevated AF MMP-9. Factors independently associated with elevated AF TIMP-1 concentrations were spontaneous labor, positive AF culture, and clinical chorioamnionitis. Simple regression analysis demonstrated a linear relationship between AF MMP-9 and AF TIMP-1 concentrations (p < 0.001), however, this model explained only 19% of the total variation in AF TIMP-1 measurements.

CONCLUSIONS: Amniotic fluid levels of MMP-9 increased markedly with advancing labor, intra-amniotic microbial colonization, and clinical chorioamnionitis. Concentrations of this principal inhibitor also appear to increase with clinically evident or culture-proven intra-amniotic infection and during spontaneous labor.

293 GRAM STAIN DIAGNOSIS OF BACTERIAL VAGINOSIS AFTER RUPTURE OF MEMBRANES. L. Bat, J. Mastroberti, E. Newton, Dept. Ob/Gyn. & Reprod. Sci. UT Houston Medical School, Houston, TX and East Carolina University School of Medicine, Greenville, NC.

OBJECTIVE: To determine the correlation of the Gram stain prior to and after rupture of membranes, and the efficacy of Gram stain diagnosis for bacterial vaginosis (BV) after membrane rupture.

METHODS: From April 1997 to May 1998, pregnant women presenting in labor or for labor induction were invited to participate. Exclusion criteria included membrane rupture prior to hospital presentation and those patients with contraindications for vaginal delivery. A Gram stain of vaginal secretions was obtained prior to membrane rupture. Approximately two hours after membrane rupture, the Gram stain was repeated. Gram stains were scored based on Nugent criteria. BV was diagnosed with a score of ≥ 7. Correlation of the Gram stain prior to and after membrane rupture was evaluated using the Spearman correlation coefficient.

RESULTS: Population characteristics (n=91) included average maternal age of 23 ± 6.0 years, 45 (49%) nulliparas, 59 (65%) African Americans, 23 (25%) Hispanics, 7 (8%) Caucasians, and 2 (2%) Asians. The mean gestational age upon study entry was 39 ± 1.7 weeks. Between the study and C-DEM (n = 60) groups, only two factors were significantly different: 1) presence of chronic hypertension (C-HTN, 9% in study group vs 0% in C-DEM; p = 0.007) and 2) GA > 37 weeks (60% in study group vs 52% in C-DEM; p < 0.001). C-DEM and C-DEMo also have similar ability to differentiate newborns with BW < 2500 g or BW ≥ 4000 g (0.57 ± 0.14 and 0.72 ± 0.10, respectively). CEFW and SEFW also have similar ability to differentiate newborns with BW < 2500 g (0.72 ± 0.10 vs 0.57 ± 0.14, respectively). CEFW and SEFW also have similar ability to differentiate newborns with BW < 2500 g or BW ≥ 4000 g (0.57 ± 0.10 vs 0.57 ± 0.14, respectively).

CONCLUSIONS: There is no advantage of SEFW over CEFW in estimating birth weight among TP, or in differentiating newborns with BW < 2500 g or BW ≥ 4000 g.

294 CLINICAL VERSUS SONOGRAPHIC ESTIMATE OF BIRTH WEIGHT AMONG TERM PARTURIENTS: A RANDOMIZED STUDY. Hendrix N. Chausten SP, Spartenburg Regional Medical Center, SC.

OBJECTIVE: The purpose of this randomized study is to determine the relative accuracy of clinical and sonographic estimate of fetal weight (CEF, SEFW) among term gestations (37-44 weeks). The primary purpose of this technique is to be better at differentiating newborns with birth weight (BW) ≤ 2500 g or ≥ 4000 g.

STUDY DESIGN: Over 30 months 758 TP were recruited of which 981 TP had CEFW, 307 SEFW. The mean GA (p = 0.04), frequency of those ≥ 41 wks (p = 0.16), station of the presenting part (p = 0.90), mean birth weight (3556 ± 496 g for CEFW vs 3338 ± 551 for SEFW; p = 0.64), and incidence of BW < 2500 g (6% vs 6%; p = 0.99) were similar for both groups. The SEFW had a higher mean gestational age (39.3 ± 3.9 vs 38.4 ± 2.9 weeks). The SEFW was significantly higher than the CEFW in the second trimester (69% vs 54%; p < 0.0001) and in the third trimester (75% vs 66%; p < 0.0001). A McNemar's test with a continuity correction was used to detect significant differences between observations for continuous variables. To protect the overall significance level, a was set at 0.025.

RESULTS: From July 91 to Feb 97, there were 9120 live births, of which 60 (0.6%) had PA. Between the study and C-DEMo patients, two sets of controls were selected: 1) group consisted of the next patient with similar route of delivery (C-RD) and, if cesarean delivery (CD) then its indication; 2) group was matched for gestational age (GA). Between the study and C-RD (n = 60) groups, only two factors were significantly different: 1) presence of chronic hypertension (C-HTN, 9% in study group vs 0% in C-DEM; p = 0.007) and 2) GA > 37 weeks (60% in study group vs 52% in C-DEM; p < 0.001). SEFW also have similar ability to differentiate newborns with BW < 2500 g (0.57 ± 0.14 vs 0.72 ± 0.10, respectively). CEFW and SEFW also have similar ability to differentiate newborns with BW < 2500 g (0.72 ± 0.10 vs 0.57 ± 0.14, respectively).

CONCLUSIONS: There is no advantage of SEFW over CEFW in estimating birth weight among TP, or in differentiating newborns with BW < 2500 g or BW ≥ 4000 g.

295 RISK FACTORS FOR PATHOLOGICAL ACIDOSIS. Hutcheson LB, Chauhan SP, Scardio JA. Medical College of Georgia, Augusta, GA; Spartanburg Regional Medical Center, Spartanburg, SC.

OBJECTIVE: To delineate the antepartum and intrapartum risk factors for pathological acidosis (PA, umbilical arterial pH < 7.00).

STUDY DESIGN: Over 6 yr, all newborns with PA were retrospectively identified. Two sets of controls were selected: 1) group consisted of the next patient with similar route of delivery (C-RD) and, if cesarean delivery (CD) then its indication were matched for gestational age (GA), race, and gestational age (GA) within 2 weeks. From each maternal chart 20 antepartum and intrapartum variables were extracted. A McNemar's test with a continuity correction was used to detect differences in discrete variables, and a Wilcoxon sign rank test was used to detect significant differences between observations for continuous variables. To protect the overall significance level, a was set at 0.025.

RESULTS: From July 91 to Feb 97, there were 9120 live births, of which 60 (0.6%) had PA. Between the study and C-DEMo (n = 60) groups, only two factors were significantly different: 1) presence of chronic hypertension (C-HTN, 9% in study group vs 0% in C-DEM; p = 0.007) and 2) GA > 37 weeks (60% in study group vs 52% in C-DEM; p < 0.001). SEFW also have similar ability to differentiate newborns with BW < 2500 g (0.57 ± 0.14 vs 0.72 ± 0.10, respectively). CEFW and SEFW also have similar ability to differentiate newborns with BW < 2500 g (0.72 ± 0.10 vs 0.57 ± 0.14, respectively).

CONCLUSIONS: There is no advantage of SEFW over CEFW in estimating birth weight among TP, or in differentiating newborns with BW < 2500 g or BW ≥ 4000 g.
296 PREDICTIVE AGREEMENT BETWEEN FSO2 AND FETAL SCALP pH CONCERNING FETAL ACIDOSIS IN CASES OF PATHOLOGICAL CARDIOTOEGRAPHY (CTG). M. Kuhnert, Dept. Ob/Gyn, Univ. of Marburg, Germany.

OBJECTIVE: To discuss and substantiate the 30% critical threshold of FSO2 and to complete the puzzle with low FSO2 and low scalp pH data in cases of pathological CTG scalp samples have been performed while FSO2 - Registration during labor was in place and while the saturation was ≤ 30%.

STUDY DESIGN: 250 cases with pathological CTG were the subject of this study. 46 term fetuses during active labor had parallel arterial oxygen saturation registration by pulse oximetry combined with CTG. They include patients in whom the FSO2 was ≤ 30% for at least 10 minutes. In these cases scalp pH sample values have been obtained simultaneously. Outcome data, Apgar scores, cord gases, and whether the infants were transferred to the neonatal intensive care unit have been examined. Compared with this, there were also cases during labor, where the FSO2 was > 30%. Also in these cases scalp pH was determined to support and demonstrate the predictive value of FSO2 for scalp pH, especially in the low ranges. All fetuses were evaluated during periods of non-measuring CTG with Nellcor N-490 FSO2 Monitoring Systems and FS14B sensors. CTG-analysis was done by means of Hannacher Score. Receiver operating characteristic analysis was done as well on all raw data, as well as on the ROC-curve from the preceding analysis.

RESULTS: These data validate the critical threshold of 30% FSO2. There was a striking agreement between the duration of time of hypoxia defined as a FSO2 less than 30% and the occurrence of pathological CTG. FSO2 values ≤ 30% for more than 10 minutes correlate well with the traditional assessments of clinical outcome such as decreased intrapartum scalp pH, and decreased postpartum cord arterial and venous pH. These results are statistically significant.

CONCLUSIONS: Low FSO2 data of ≤ 30% for at least 10 minutes or longer correlate significantly with pathological CTG-patterns and with low scalp pH values and have a predictive value concerning fetal outcome.


OBJECTIVE: To study the predictive properties of fetal scalp lactate and pH in relation to severe cord arterial acidemia.

STUDY DESIGN: Descriptive study of 447 women who had fetal scalp blood sampling performed due to fetal distress within 60 minutes prior to delivery. Of these women 326 were evaluated by means of lactate measurements and 186 by pH analysis. All patients had acid base status determined in cord arterial blood immediately after delivery. The predictive properties of lactate and pH in relation to severe cord arterial acidemia (pH < 7.0 and/or base deficit ≥ 21 mmol/l) were evaluated by ROC analysis.

RESULTS: The area under the ROC curve for the lactate group was 0.778 (95% CI 0.729-0.822) and for the pH group 0.777 (95% CI 0.711-0.835). They did not differ from each other. The maximum sensitivity and specificity for lactate were reached at 5.6 mmol/L level and for pH at 7.14.

CONCLUSIONS: Fetal scalp lactate measurements have the same predictive properties as scalp pH in prediction of severe cord arterial acidemia.

298 EFFECTS OF METABOLIC VERSUS RESPIRATORY VERSUS MIXED ACIDEMIA IN TERM INFANTS. BM Casey, DD McIntire, KJ Leveno, Department of Obstetrics and Gynecology, University of Texas Southwestern Medical Center at Dallas.

OBJECTIVE: To assess the effects of each type of umbilical cord blood acidemia in term infants.

STUDY DESIGN: Retrospective analysis of umbilical artery blood gas in 111,498 liveborn, singleton cephalic infants exposed to labor and delivered between 37 and 41 weeks. Acidemia was defined as a pH < 7.10. Mean cord gas values ± 2SD for the study population were used to define metabolic, respiratory, and mixed acidemias.

RESULTS:

<table>
<thead>
<tr>
<th>Type of Acidemia (%)</th>
<th>None</th>
<th>Metabolic</th>
<th>Respiratory</th>
<th>Mixed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n=169,159</td>
<td>n=167</td>
<td>n=659</td>
<td>n=1513</td>
</tr>
<tr>
<td>Apgar ≤ 5 at minutes</td>
<td>62 (4)</td>
<td>6 (4)*</td>
<td>1 (.1)</td>
<td>24 (.9)*</td>
</tr>
<tr>
<td>RDS</td>
<td>385 (4)</td>
<td>15 (9)*</td>
<td>6 (1)*</td>
<td>75 (5)*</td>
</tr>
<tr>
<td>Seizures</td>
<td>116 (.1)</td>
<td>7 (4)*</td>
<td>2 (.3)</td>
<td>29 (2)*</td>
</tr>
<tr>
<td>Sepsis</td>
<td>217 (.2)</td>
<td>2 (.1)*</td>
<td>1 (.2)</td>
<td>13 (.8)</td>
</tr>
<tr>
<td>Neonatal death</td>
<td>108 (.1)</td>
<td>5 (.3)*</td>
<td>1 (.1)</td>
<td>15 (.1)*</td>
</tr>
</tbody>
</table>

*Significant, p < .05

CONCLUSIONS: Neonatal morbidity and mortality are increased in term infants born with metabolic or a metabolic component acidemia compared to infants with respiratory acidemia.

299 INCIDENCE OF METABOLIC, RESPIRATORY, OR MIXED ACIDEMIA ACCORDING TO GESTATIONAL AGE. BM Casey, DD McIntire, KJ Leveno, Department of Obstetrics and Gynecology, University of Texas Southwestern Medical Center at Dallas.

OBJECTIVE: To determine if gestational age is associated with either metabolic, respiratory, or mixed acidemia.

STUDY DESIGN: Retrospective analysis of umbilical artery blood gases in 127,446 liveborn, singleton cephalic infants exposed to labor and delivered between 26 and 42 weeks gestation. Acidemia was defined as a pH < 7.10. Mean cord gas values ± 2SD for the study population were used to define metabolic, respiratory, and mixed acidemias.

RESULTS:

<table>
<thead>
<tr>
<th>Weeks gestation</th>
<th>Acidemia Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>26-29</td>
</tr>
<tr>
<td>None</td>
<td>n=466</td>
</tr>
<tr>
<td>Metabolic</td>
<td>95%</td>
</tr>
<tr>
<td>Respiratory</td>
<td>7 (.3)</td>
</tr>
<tr>
<td>Mixed</td>
<td>15 (4)</td>
</tr>
</tbody>
</table>

*Significant, p < .05

CONCLUSIONS: 1) The incidence of metabolic acidemia was unrelated to gestational age. 2) Respiratory acidemia was significantly associated with 42 weeks gestation or greater and, 3) mixed acidemia was increased in infants delivered at 35 weeks or less.
300 INTRAPARTUM FETAL HEART RATE (FHR) RESPONSES TO VIBROACOUSTIC STIMULATION (VAS) VERSUS FETAL BLOOD pH STUDIES TO PREDICT FETAL OUTCOME IN LABOR. C.C. Lin, R. Vasallo, R. Mitendorf, Dept. Ob/Gyn, Univ. of Chicago, Chicago, IL

OBJECTIVE: To examine the relationship between FHR responses to intrapartum VAS and fetal blood pH studies in two hypotheses. (1) A good correlation between FHR responses to VAS and fetal blood pH, thus responses to VAS can be used in lieu of fetal blood pH studies. (2) FHR prediction of fetal well-being is equally effective as fetal blood pH in the first and second stages of labor and term preterm fetuses.

STUDY DESIGN: 113 patients were studied prospectively in either the active phase of first stage or second stage of labor. They were selected based on the presence of variable decelerations, late decelerations, tachycardia, or decreased baseline variability. The fetus received a VAS for five 20-second and FHR changes were recorded. Fetal scalp blood pH or umbilical arterial blood pH was obtained in each case. Correlations were made between two tests and their predictive capability of fetal outcome parameters was compared. Fisher's exact test and odds ratio with 95% CI was used when appropriate.

RESULTS: Excellent correlations between VAS responses and fetal blood pH were found in both the first stage (n = 55, P = 0.0005, OR = 10.7 ± 5.07) and the second stage of labor (n = 60, P = 0.009, OR = 14.0 ± 7.48). A higher predictive positive value (PPV) was observed when a cutoff of 7.20 was compared to 7.10 to define fetal acidosis (PPV 67% vs. 11%, P = 0.05). It was also observed that VAS responses were comparable between term (≥ 37 weeks) and preterm (≥ 34 weeks) fetuses. Finally, VAS response was found to be an equally effective tool to predict fetal outcome (low 5 min Apgar, neonatal intensive care unit admission, neonatal morbidity, meconium stained amniotic fluid, cesarean section for fetal distress) compared to fetal blood pH studies.

CONCLUSIONS: Two hypotheses listed in OBJECTIVE were confirmed. The clinical implication of this study is that VAS can be used in lieu of fetal blood pH in obstetric practices in both academic centers and community hospitals.

301 ACCURACY OF FETAL PULSE OXIMETRY IN THE RANGE OF LOW OXYGEN SATURATION. A.K. Luttkus, E. Eppel*, J.W. Dudenhausen; Clinic of Obstetrics Humboldt-Universitat Berlin, Charite Campus Virchow-Klinikum, Germany

OBJECTIVE: Fetal pulse oximetry (FPO) is supposed to identify fetal compromise caused by reduced oxygen supply. Dual sensor studies showed a precision of the single oximeter FS14B of ±5.7% with relevant deficits in the low saturation range. Therefore a comparison of FPO readings with the low saturation range. Therefore a comparison of FPO readings with

STUDY DESIGN: In a prospective observational trial on 170 fetuses with complications caused by reduced oxygen supply, we compared the precision of the single oximeter FS14B of ±5.7% with relevant deficits in the low saturation range. Therefore a comparison of FPO readings with the low saturation range. Therefore a comparison of FPO readings with

RESULTS: Excellent correlations between VAS responses and fetal blood pH were found in both the first stage (n = 55, P = 0.0005, OR = 10.7 ± 5.07) and the second stage of labor (n = 60, P = 0.009, OR = 14.0 ± 7.48). A higher predictive positive value (PPV) was observed when a cutoff of 7.20 was compared to 7.10 to define fetal acidosis (PPV 67% vs. 11%, P = 0.05). It was also observed that VAS responses were comparable between term (≥ 37 weeks) and preterm (≥ 34 weeks) fetuses. Finally, VAS response was found to be an equally effective tool to predict fetal outcome (low 5 min Apgar, neonatal intensive care unit admission, neonatal morbidity, meconium stained amniotic fluid, cesarean section for fetal distress) compared to fetal blood pH studies.

CONCLUSIONS: Two hypotheses listed in OBJECTIVE were confirmed. The clinical implication of this study is that VAS can be used in lieu of fetal blood pH in obstetric practices in both academic centers and community hospitals.
304 RELATIONSHIP BETWEEN NORMAL AMNIOTIC FLUID INDEX AND BIRTHWEIGHT IN TERM PATIENTS WITH INTACT MEMBRANES PRESENTING FOR LABOR. TD Myers, TM Nguyen. Dept. OB/Gyn, Univ of IL, Chicago, IL

OBJECTIVE: Polyhydramnios has been shown to be a risk factor for macrosomia. We sought to investigate if a relationship between birthweight and the amniotic fluid index existed for term patients with intact membranes, and if so whether this could predict or exclude the presence of macrosomia.

STUDY DESIGN: 274 patients with intact membranes of at least 37 weeks gestation had an amniotic fluid index (AFI) performed upon presentation to Labor & Delivery. 291 patients had an AFI between 5.0 and 24.9. Basic demographic information was collected, as well as mode of delivery, birthweight, presence of diabetes, and delivery outcome. Statistical comparison using chi-square test of association, student T test, ANOVA was made with significance set at P < 0.05.

RESULTS: The mean gestational age was 39.5 weeks and the mean AFI was 11.3. There were 28 infants with birthweights (BW) greater than 4000 grams and 3 above 4500 grams. The cesarean section rate was 16.9%. There were 28 infants with birthweights (BW) greater than 4000 gm (13.5 vs 11.0, P <0.002). Patients with an AFI >15.0 (1 standard deviation from the mean) had over twice the incidence of BW >4000 gm, (RR 2.72; 1.1 - 6.6) (32.1% vs 14.8%; P<0.027). Significance increased with increasing BW >4000 gm (13.5 vs 11.0, P <0.002). Patients with an AFI >15.0 (1 standard deviation from the mean) had over twice the incidence of BW >4000 gm, (RR 2.72; 1.1 - 6.6) (32.1% vs 14.8%; P<0.027). Significance increased with increasing AFI. A linear relationship was observed between AFI and BW (P <.0001). Birthweight increased with increasing AFI. There was no relationship between C/S and AFI. Presence/absence of diabetes did not affect these results.

CONCLUSION: Increasing AFI appears to correlate with increasing BW. BW >4000 gm is associated with increased incidence of cesarean delivery. An AFI >15 is increasingly associated with the over double occurrence of a BW >4000 gm. AFI testing at admission could aid in determining which patients are at risk for macrosomia so management and preparatory plans could be adjusted accordingly.

306 ADMISSION HR BRADYCARDIA: WAS THE FETAL BRAIN INJURY POTENTIALLY PREVENTABLE. MO Ahn, BD Golditch, JP Phelan. Dept. of Ob/Gyn, Cha Woman’s Hospital, Seoul, Korea, Kaiser Permanente Medical Center, Pomona Valley Hospital Medical Center, Pomona, California and the Childbirth Injury Prevention Foundation.

OBJECTIVE: To determine whether the admission FHR bradycardia (FHR < 90 bpm) causing fetal brain injury was potentially preventable.

STUDY DESIGN: Ten patients with an admission FHR bradycardia were evaluated to determine whether antepartum obstetrical interventions could have potentially prevented fetal brain injury. For this study, all fetuses were deemed to be brain damaged on admission to the hospital.

RESULTS: For these 10 patients, the mean admission-delivery interval was 43.9 ± 33 minutes with a range 14 to 120 minutes. Maternal complications were: Diabetes mellitus - 5; preeclampsia - 1; frank breech cord prolapse; prior C/S -uterine rupture - 2, postdates (≥ 42 weeks) - 1. Overall, 7 (70%) neonates had nonpreventable brain injuries due to an admission FHR bradycardia such spontaneous uterine rupture prior to labor. Thus, 3 neonates had potentially preventable brain injuries: (1) fetal surveillance testing in 2 patients with diabetes mellitus/postdate pregnancy; (2) delivery on the day of an abnormal fetal surveillance test result.

CONCLUSIONS: Most neonates with an admission FHR bradycardia do not have potentially preventable brain injuries. But, in those instances where an injury does arise, the clinical focus should be on whether the FHR bradycardia could have been prevented through the use of fetal surveillance testing or other antenatal obstetrical techniques, and not on whether the admission-delivery interval could have been shortened.
POSTER SESSION III

Friday, January 22, 1999
10:00 am - Noon

Yosemite and Franciscan Rooms

CATEGORIES
Anesthesia
Prematurity
Operative Obstetrics
Doppler

Poster Numbers
307-421

Judges: Maurice L. Druzin, MD
Thomas M. Goodwin, MD
Sarah J. Kilpatrick, MD

OBJECTIVES: To determine if the use of epidural analgesia is associated with a difference in the rate of severe perineal trauma at vaginal delivery.

STUDY DESIGN: We studied 1942 consecutive low risk, term, vaginal deliveries in nulliparous women at a single institution. The rate of severe perineal trauma (3rd & 4th degree lacerations) was compared for women who received epidural analgesia in labor with those who did not. Statistical analyses were performed using the X^2 statistic and logistic regression.

RESULTS: The overall rate of third degree laceration was 10.8% (n=210) and that of fourth degree was 2.2% (n=65). Epidural analgesia was received by 1376 (70.9%) women. Among women who received epidural analgesia, 16.1% had a severe perineal laceration compared with 9.7% among the 566 women who did not (OR=1.8, 95% CI; 1.5, 2.4). When controlling for birthweight, use of oxytocin and maternal age in a logistic regression analysis, epidural remained a significant predictor of severe perineal injury (OR=1.4, 95% CI; 1.0, 2.0). Since epidural use is consistently associated with an increased need for assisted vaginal delivery and consequently episiotomy, we constructed a logistic regression model to evaluate whether the higher rate of these delivery practices was responsible for the effect of epidural on severe perineal trauma. Our data conclude that once assisted vaginal delivery and episiotomy were included in the model, epidural was no longer associated with perineal injury (OR=0.86, 95% CI; 0.6, 1.3).

CONCLUSIONS: Epidural analgesia increases the rate of severe perineal trauma because of the more frequent need for assisted vaginal delivery and episiotomy. It is important that both the obstetrician and parturient are aware of this indirect effect of epidural.

308 OBSTETRIC TECHNIQUE AND SEVERE PERINEAL TRAUMA. JN. Robinson, E.R. Norwitz, A.P. Cohen, T.F. McElrath, E.S. Lieberman. Dept. Obst./Gyn, Brigham & Women's Hospital, Boston, MA.

OBJECTIVES: To determine if choice of obstetric instrument at assisted vaginal delivery is associated with a difference in the rate of severe perineal trauma, and whether, for each instrument, this rate is modified by use of midline episiotomy.

STUDY DESIGN: The occurrence of severe perineal trauma (3rd or 4th degree laceration) among 323 consecutive assisted vaginal deliveries in nulliparous parturients was evaluated according to type of instrument (Simpson's forceps, Tucker-McLane forceps, vacuum) and use of episiotomy (midline episiotomy being the standard protocol at our institution). The X^2 statistic and logistic regression analysis were used.

RESULTS: The rate of severe perineal laceration was 55.7% (87/162) with forceps and 29.8% (48/161) with vacuum. In a logistic regression analysis controlling for assisted delivery indication, station, position, fetal weight, episiotomy, oxytocin use, and maternal age, forceps delivery continued to be associated with a significantly higher rate of severe perineal trauma when compared with vacuum (OR=2.7, 95% CI; 1.6, 4.4). There was no significant difference in the rate of severe perineal trauma according to type of forceps used. The rate was 57% (29/51) for Simpson's and 53% (55/105) for Tucker-McLane. With forceps, use of episiotomy did not affect the incidence of severe perineal trauma (55% vs 46%, RR=1.2, 95% CI; 0.76, 1.9). In contrast, with vacuum, an increased rate of severe perineal trauma was noted when episiotomy was used (35% vs 9.4%, RR=3.7, 95% CI; 1.3, 11.2).

CONCLUSIONS: Forceps delivery is associated with a rate of severe perineal trauma in excess of 50%. This rate remains similar regardless of type of forceps used and of use of episiotomy. Somewhat lower rates of severe perineal trauma are observed with vacuum deliveries compared with forceps. With vacuum, severe perineal trauma rates are significantly higher when episiotomy is performed. If obstetric indications necessitate forceps rather than vacuum delivery, neither the type of forceps nor episiotomy will influence the incidence of severe perineal trauma. If vacuum delivery is performed, use of episiotomy will increase the rate of severe perineal trauma.

309 PREEMPTIVE ANALGESIA USING LOCAL ANESTHESIA FOR WOMEN UNDERGOING CESAREAN SECTION. AM Haffji, MD, SM Wold, MD, T Assat, MD, MD, PJ Runney RNG, CR Walker, MD. Dept of Obst/Gyn, University of California, Irvine Medical Center, Orange CA and Long Beach Memorial Medical Center, Long Beach, CA.

OBJECTIVE: To determine if the addition of preincisional anesthetic to patients receiving regional anesthesia for cesarean section significantly lowers postoperative pain.

STUDY DESIGN: This is a prospective, randomized, placebo-controlled, double-blind, multi-center clinical trial of women undergoing elective cesarean section with regional anesthesia. Patients were randomized to one of 3 groups: Group I received preincisional local infiltration with 30 mg of 0.25% bupivacaine; Group II received preincisional local infiltration with normal saline (placebo); Group III received no treatment. All patients received regional anesthesia and Dorsa-morph. Postoperative incisional pain was evaluated using a visual analog pain scale at 12, 24, and 48 hours. Time to first request for pain medication and total pain medication requirements were compared between the groups. A power calculation was performed to determine a target sample size. Descriptive statistics, one-way ANOVA, students t test, and Bonferroni t method were used where appropriate. Results were considered significant at a p value <.05.

RESULTS: This abstract reports preliminary data. Sixty-five women were randomized. The demographics of the groups, such as age, ethnic body mass index and indication for c-section, were similar. There were 25 primary and 40 repeat c-sections. Fifty-eight patients received spinal and 7 received epidural anesthesia. Sixty-two women had Pfannensteil incisions and 10 had midline incisions. The difference in mean time to first postoperative analgesic request between the groups was statistically significant, 14.1 hours in Group I, 16.6 hours in Group II, and 14.8 hours in Group III. Pain scores at 24 and 48 hours between the groups were similar.

CONCLUSION: The preliminary results of this study do not show a benefit in the addition of preincisional local anesthesia in patients receiving regional anesthesia for cesarean section. The target sample size has not been achieved, allowing for the possibility of a type II beta error. Alternatively, there may be no benefit in using preincisional local anesthesia as a supplement to long-acting regional anesthesia in patients undergoing cesarean section.

310 HISTOLOGICAL PROGRESSION OF CLINICAL CHORIOAMNIONITIS IN PATIENTS WITH PRETERM PREMATURE RUPTURE OF MEMBRANES. H. How for the NICHD-MFMU Network, Bethesda, MD.

OBJECTIVE: To determine the anatomic progression of neutrophils through the fetal membranes.

STUDY DESIGN: The placenta of 268 patients participating in a multicenter trial of antimicrobial therapy for the expectant management of preterm premature rupture of membranes at 24-32 weeks gestation were evaluated for inflammation including neutrophils in the layers of the membranes, i.e. amnion, chorion connective tissue, junction of chorion connective tissue or epithelium, chorion epithelium and decidua. For each layer, neutrophils were evaluated in each patient. The 3 layers were defined as the chorionic, chorion epithelium, and decidua. Patients were randomized to receive no treatment, low dose amoxicillin, or high dose amoxicillin. Results were considered significant at a p value <.05.

RESULTS: There were 128 patients with neutrophilic infiltration of the amnion in the membranes, starting from the fetal to the maternal side. Sixty-six percent had associated involvement of all the layers of the membranes. Of the 42 patients with neutrophils in the chorion connective tissue, 67% had involvement of all the deeper layers of the membrane. Of the 35 patients with either neutrophils at the junction of chorion connective tissue or epithelium, 77% had inflammation of both the chorion epithelium and decidua. Of the 10 patients with neutrophils in the chorion epithelium, 50% had associated inflammation of the decidua. Of the 47 patients with absence of inflammation in the decidua, 95.7% had no signs of inflammation detected in all the remaining superficial layers (toward the amnion). Of the 56 patients who had clinical chorioamnionitis, 8 patients did not manifest the most moderate evidence of inflammation in the chorion, i.e. neutrophils in the chorion epithelium. Fifteen patients had purulent chorioamnionitis histologically, but only 15 had clinical chorioamnionitis.

CONCLUSIONS: No anatomic progression of neutrophils through the fetal membranes could be demonstrated by consistent anatomic patterns i.e. neutrophils always present in the deeper maternal layers. The presence in organisms, with differences in chemotaxis and neutrophil preferred location within the membranes, could explain our results.

OBJECTIVE: To determine if the presence of Interleukin-6 (IL-6) in maternal plasma prior to delivery predicts neonatal and/or infectious complications in patients with preterm premature rupture of membranes (PPROM).

STUDY DESIGN: Patients with PPROM between 24 and 35 weeks gestation were selected for this IRB approved prospective, longitudinal study. Maternal plasma samples were obtained by centrifugation and stored at -70°C. All patients received Ampicillin-sulbactam and steroids. Interleukin-6 concentrations were determined by ELISA using fifty microliters of plasma assayed in duplicate. ELISA sensitivity was 18 pg/ml. Neonatal and infectious complications of interest were RDS, NEC, IVH, intramammary infection, presumed neonatal sepsis, neonatal sepsis, including pneumonia. Maternal, obstetrical, and neonatal data were collected. Statistical methods included Student t-test, Fisher's exact test and Mann-Whitney U tests.

RESULTS: Fifty-seven patients' plasma were analyzed. Thirty-five had positive plasma IL-6 prior to delivery. Twenty-two patients had at least one neonatal complication with 24 (89%) being positive for IL-6. Of the 30 patients without complications only 11 (37%) were positive (p<0.0001, OR 13.2, 95% CI of 2.36-54.3), 2) 17 patients went into labor within 48 hrs of sampling, of which, 15 were IL-6 positive and seven were negative (p=0.725).

Spontaneous labor with seven being positive for IL-6 and ten being negative. Of the 14 induced for lung maturity or gestational age, seven were positive positive (p<0.0003, OR 13.2, 95% CI of 2.36-54.3), 2) 17 patients went into labor within 48 hrs of sampling, of which, 15 were IL-6 positive and seven were negative (p=0.725).

CONCLUSIONS: Only 11% of our PPROM patients were eligible for randomization to treatment with IL-6 and the decision to treat with IL-6 was based on clinical judgments. The study was terminated early due to lack of recruitment.

312 LABOR PREDICTION IN PATIENTS WITH PRETERM PREMATURITY RUPTURE OF MEMBRANES USING MATERNAL PLASMA INTERLEUKIN-6 Barralleaux PS*, Lewis DF, Wang Y, Adair CD, Gavrila D, Bajer J, LiUMC-Shreveport, Departments of Ob/Gyn and Pediatrics

OBJECTIVE: The purposes of this study were: 1) To determine if the presence of Interleukin-6 (IL-6) in the maternal plasma could predict latency of patients with preterm premature rupture of membranes (PPROM). 2) To determine if IL-6 could predict the onset of labor for patients with extended latency.

STUDY DESIGN: Patients between 24 and 35 weeks EGA with PPROM were asked to participate in this prospective, longitudinal study. Patients underwent blood sampling at the time of admission prior to the administration of antibiotic therapy and every three to four days until delivery. Plasma samples were obtained by centrifugation and stored at -70°C until assayed. Each IL-6 sample was run in duplicate using ELISA with a sensitivity of 18 pg/ml. A value equal to or exceeding 18 pg/ml was considered positive. Plasma from the initial sampling and that just prior to delivery were used to determine if maternal plasma IL-6 concentrations could predict the latency period of those pregnancies. Statistical analysis included Chi square, Student t-test, Fisher's exact test and Mann-Whitney U tests.

RESULTS: Fifty-seven patients were evaluated. 1) Latency of the 24 patients that delivered within 72 hours of rupture, 22 were IL-6 positive on presentation. 35 patients delivered past 72 hours, of which, 15 were IL-6 positive (p=0.003, OR 13.2, 95% CI of 2.36-54.3), 2) 17 patients went into spontaneous labor with seven being positive for IL-6 and ten being negative. Of the 14 induced for lung maturity or gestational age, seven were positive and seven were negative (p=0.725).

Spontaneous labor with seven being positive for IL-6 and ten being negative. Of the 14 induced for lung maturity or gestational age, seven were positive positive (p<0.0003, OR 13.2, 95% CI of 2.36-54.3), 2) 17 patients went into labor within 48 hrs of sampling, of which, 15 were IL-6 positive and seven were negative (p=0.725).

CONCLUSIONS: Patients with PPROM and measurable IL-6 concentrations at admission are more likely to deliver within three days of rupture. Presence of IL-6 after 72 hours did not appear to predict spontaneous labor.

313 ARE PATIENTS WITH A NEGATIVE STERILE SPECULUM EXAM (SSE) FOR PREMATURITY RUPTURE OF MEMBRANES (PPROM) STILL AT INCREASED RISK FOR PREGNANCY COMPLICATIONS? JL Ataturk*, LJ Groome, Ch HoF, University of South Alabama, Mobile, AL

OBJECTIVE: To determine the pregnancy outcome of women who had a negative SSE when evaluated for the presence of PPROM.

METHOD: We prospectively identified 292 consecutive women who presented to Labor and Delivery with a complaint of PROM but who had a negative SSE, defined as no pooling of amniotic fluid in the posterior vaginal fornix and the absence of a fern pattern. Therefore, women in the study group were not felt to have PROM and were discharged from Labor and Delivery. The control group (n = 282) consisted of women who were matched by prenatal visit at the same estimated gestational age (EGA) at which an index study subject was evaluated for PROM, no woman in the control group was evaluated for PROM prior to the onset of labor. The outcome variables analyzed were latent period, EGA at delivery, birth weight, infectious complications, and oligohydramnios.

RESULTS: There were no group differences in maternal age, payment status, and parity, but the study group had more white women [148 (52.5%) vs. 107 (31.9%), χ2 = 13.16, p = .001] and more mothers who smoked [70 (27.0%) vs. 55 (18.8%), χ2 = 5.32, p = .02]. There was no difference between groups in EGA at delivery (39.3 ± 2.1 wk vs. 39 ± 2.0 wk) or in the number of women who delivered before 34 wks [7 (2.5%) vs. 4 (1.4%)] and before 37 wks [27 (9.6%) vs. 25 (8.9%)]. Although both groups had a similar mean interval from screening until delivery (30.6 ± 31.4 days vs. 32.1 ± 30.6 days), significantly more women in the study group delivered within 24 hrs [27 (9.6%) vs. 12 (4.3%), χ2 = 6.20, p = .013], within 48 hrs [37 (13.1%) vs. 19 (6.7%), χ2 = 6.42, p = .011], and within 72 hrs after screening [52 (18.4%) vs. 30 (10.6%), χ2 = 6.91, p = .008]. There was no difference between groups in the frequency of chorioamnionitis, endometritis, fetal growth restriction, nonreactive nonstress testing, nonreassuring fetal status during labor, or oligohydramnios (all p-values > .05).

In addition, there were no group differences in mean birth weight (3200 ± 929 g vs. 3255 ± 977 g) or in the proportion of infants born weighing < 2500 g [19 (6.7%) vs. 22 (7.8%)].

CONCLUSIONS: Women with negative testing for PROM were twice as likely to deliver within 3 days of screening as control subjects who were not screened for PROM, but did not have an increased frequency of pregnancy complications.

314 RANDOMIZED CONTROLLED TRIAL OF INPATIENT vs. OUTPATIENT MANAGEMENT OF PPROM C Ryan, M Oskamp*, PGR Seaward, T Kitch*, Barrett J, Brennan B, ME Salamek*, K O'Brien*, Mt Sinai & Women's College Hospitals, University of Toronto & McMaster University, Ontario, CANADA

OBJECTIVE: To evaluate clinical, psychosocial, and economic outcomes of women with preterm premature rupture of membranes (PPROM) who were randomized to inpatient or outpatient care, using strict criteria and protocols presented previously (SPO '96).

STUDY DESIGN: To date, 61 women have been randomised to inpatient (30) or outpatient (31) care. Data were analysed, based on intention to treat, using descriptive statistics, ANOVA, χ2, and Fisher's exact tests where applicable, with significance at p<0.05.

RESULTS:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Inpatient n=30</th>
<th>Outpatient n=31</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>GA at PPROM (wk)</td>
<td>29.9</td>
<td>30.6</td>
<td>NS</td>
</tr>
<tr>
<td>Latent interval (hrs)</td>
<td>600</td>
<td>540</td>
<td>NS</td>
</tr>
<tr>
<td>GA delivery (wk)</td>
<td>33.4</td>
<td>33.9</td>
<td>NS</td>
</tr>
<tr>
<td>Induction of labour</td>
<td>24%</td>
<td>29%</td>
<td>NS</td>
</tr>
<tr>
<td>Caesarean Section</td>
<td>31%</td>
<td>3%</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Chorioamnionitis</td>
<td>50%</td>
<td>21%</td>
<td>NS</td>
</tr>
<tr>
<td>Hospital time (hrs)</td>
<td>266</td>
<td>142</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Cost/patient ($Can)</td>
<td>8,342</td>
<td>5,366</td>
<td>&lt;0.05</td>
</tr>
</tbody>
</table>

Demographics, birthweight, 5 min Apgars, NICU admissions and neonatal infections were similar in both groups. Outpatients identified fewer problems and were more satisfied with their care.

CONCLUSIONS: Only 11% of our PPROM patients were eligible for outpatient care. CS rate was lower in outpatients, which requires evaluation in a larger study. Most other clinical outcomes were similar in both groups. Savings of $Can 3,000-4,000 per outpatient treated were realised. Women were more satisfied with outpatient care. A multicentre RCT is being planned.

OBJECTIVE: To compare the outcome of multifetal pregnancies treated by selective termination or expectant management in preterm premature rupture of the membranes (PPROM).

STUDY DESIGN: A retrospective case-control study was done of 144 charts of premature neonates at UCSD Medical Center from 1991-1994. 77 cases were matched with 77 controls for gestational age (GA) at birth (mean 29 weeks), sex, birth weight (BW) within 250 grams (mean 1418 g), and year of birth. Cases were defined as rupture of membranes (ROM) >24 hours and GA at delivery <34 weeks. Placentas were examined histologically, and choioamnionitis defined by clinical and histologic criteria.

RESULTS: While there was a significant increase in the incidence of all IVH in the case group (40% vs 17%, p=0.005), these were predominantly grade I and II lesions. We found no significant differences between case and controls in the frequency of grade III and IV IVH, echocardiographic ventricular dilation, or white matter injury scores. When cases and controls were grouped by GA at birth, lower GA was a powerful predictor of increased risk of IVH. p=0.002, and white matter injury, p=0.004. Risk of choioamnionitis increased with longer duration of membrane rupture (mean duration of ROM 11±17.86 days) compared to infants without choioamnionitis (mean duration of ROM 3.4±6.95 days). Neither clinical nor histologic choioamnionitis was independently associated with IVH injury. Incidence of IVH, echocardiograms, and white matter injury scores were not affected.

CONCLUSION: The advantage of increased GA at birth outweighs the risk of choioamnionitis and its role in the development of IVH. The current clinical practice of prolonging pregnancy in uncomplicated PPROM until the onset of clinical choioamnionitis or other complications necessitating delivery should be continued.
319 RETROSPECTIVE REVIEW OF EARLY AND PROLONGED PRETERM PREMATURE RUPTURE OF MEMBRANES. A. Buchbinder*, B. Ferrara*, S.E. Calvin. Div. Neonatology and Div. Perinatology, Abbott Northwestern Hospital and Minneapolis Children's Medical Center, Minneapolis, MN.

OBJECTIVE: To evaluate morbidity and mortality in neonates born to mothers with midtrimester premature rupture of membranes (MPROM) of ≥ 3 days. To evaluate neurodevelopmental sequelae in these infants up to 2 years of age.

STUDY DESIGN: A retrospective chart review (1990 through 1998) was conducted at a tertiary care center. The study group included all patients with MPROM of ≥ 3 days expectedly managed between 15-35 weeks gestation. A subset of infants was evaluated by the Bayley scoring system of neurodevelopment. The use of corticosteroids and tocolytics was at the discretion of the individual attending physician. Neonatal survival (defined as survival until discharge), primary sepsis (within 72 hours of life), secondary sepsis (> 72 hours of life), and respiratory complications (hyaline membrane disease and bronchopulmonary dysplasia) were evaluated.

RESULTS: Overall survival was 51.5% (102/198 infants survived the neonatal period). Thirty-five died prior to discharge from the intensive care unit and 62 died in the delivery room. Neonatal complications included intraventricular hemorrhage (27.7% 3.2 grade III, 3.2 grade IV); retinopathy of prematurity, 87% (15% grade III, 2.9% grade IV); hypoplastic lungs, 15.7%; primary sepsis, 95.1%; secondary sepsis, 31.4%; respiratory complications, 91.2%; air leak 16.7%. None of the infants developed limb contractures. Of the 81 survivors, 45 had Bayley scoring up to 2 years of age. Of these infants, 44.4% (20/45) were normal neurodevelopmental delay was mild in 15.6% (7/45); moderate 24.4% (11/45); severe in 15.6% (7/45).

CONCLUSIONS: The management of MPROM poses several risks for the fetus. Expectant management is a viable option. The potential for short and long term neonatal sequelae need to be discussed with the patient at the time of rupture.


OBJECTIVES: To investigate whether apoptosis of human fetal amnion was associated with preterm labor.

STUDY DESIGN: Human fetal membranes were obtained from preterm patients with labor or elective cesarean section (C/S) without labor. Apoptosis was performed using fluorescein labeled ApopTag® kit, based on the TUNEL. Terminal dUTP labeling assay. This assay identifies apoptotic nuclei with green fluorescence at 486 nm and all nucleated cells with red fluorescent stain with propidium iodide in the amnion epithelial cells. Five random fields of each specimen were blindly read by investigators. Percent apoptosis of total fields was calculated and compared between the two groups (n=15 respectively). Mann-Whitney U test and coefficients of variance were used for statistical analyses. Data are expressed as medians with ranges.

RESULTS: There were no significant differences in maternal age, gestational age, parity or race between the two groups. Patients with preterm labor had significantly higher percent apoptosis in fetal amnion epithelial cells as compared to elective C/S without preterm labor (69.9%, range 0.0 to 100% vs 0.0%, range 0.0 to 69.2%, P=0.0007). Both inter-observer and intra-observer were less than 10%.

CONCLUSIONS: Our data indicate that apoptotic cell death in human fetal amnion epithelial cells may play a key role in the pathogenesis of preterm labor. The mechanisms regulating apoptosis in preterm labor have yet to be determined.

322 A PROMOTER MUTATION IN THE TUMOR NECROSIS FACTOR α GENE: A POSSIBLE ASSOCIATION WITH INTRAAMNIOTIC INFECTION AND PRETERM DELIVERY. D.Dizon-Townson, S.Kinney*, J.Lux*, K.Ward. Dept. of Ob/Gyn, Univ. of Utah, Salt Lake City, UT.

OBJECTIVE: To study this mutation in a well-defined cohort with intra-amniotic infection and preterm delivery (PTD). A mutation in the promoter region of the TNF α gene, TNF T2, which leads to increased transcription, has been reported to be a genetic marker for PTD. We hypothesized there may be an association of the TNF T2 allele with PTD occurring with infection. Our objective was to study this mutation in a well-defined cohort with intra-amniotic infection associated with PTD.

STUDY DESIGN: DNA was extracted from whole blood of 39 women and 33 neonatal cord bloods from pregnancies complicated with clinical chorioamnionitis and PTD less than 2 weeks EGA. Polymerase chain reaction was followed by allele-specific restriction with Nad for mutation detection.

RESULTS: Fifty pregnancies with PTD and chorioamnionitis were identified. No significant differences for the TNF T2 carrier rates were identified between mothers (11%) or fetuses (13%) in the cohort compared to normal term pregnancies (15%). In 23 of the 50 pregnancies, both mothers and neonates were genotyped. In 8/23 (35%) either the mother, fetus or both carried the TNF T2 allele.

CONCLUSIONS: In the cohort pregnancies where both mother and neonate were genotyped, 35% of pregnancies carried a mutation that predisposes to elevated TNF α.
**323 EXPRESSION OF INTERLEUKIN-6 AS A PREDICTOR OF PRETERM LABOR.** K. Rasmussen, T. Morgan, K. Ward. Dept. OB/Gyn, Univ. of Utah, Salt Lake City, UT.

**OBJECTIVE:** Numerous studies support a strong association between preterm labor and intrauterine infections. Levels of interleukin-6 (IL-6) are increased in intrauterine infections. The objective of this study was to evaluate the expression of IL-6 in cervical secretions as a screening test for preterm labor using reverse transcription PCR.

**STUDY DESIGN:** We collected cervical secretions from 19 patients with inclusion criteria including a gestational age of less than 37 weeks and the presence of at least 4 contractions per hour. Exclusion criteria included intercourse within the last 24 hours, vaginal bleeding, previous cervical exam within the last 12 hours, multiple gestations, and other medical problems including diabetes, chronic hypertension, rupture of membranes and abruption. The control group consisted of patients with a gestational age greater than or equal to 37 weeks at delivery. We collected cervical secretions by swabbing the external cervical os with a Q-tip applicator and total RNA was purified from these samples. Reverse transcription PCR analysis was performed using primers specific for IL-6 and that were scored for the presence or absence of the product. GAPDH served as the positive control for each sample. We tested for significance by Chi square analysis using the Fisher exact test.

**RESULTS:** In the PTL group, the mean gestational age at sample collection and delivery was 30.3 and 35.2 weeks, respectively. In the term delivery group, the mean gestational age at sample collection and delivery was 29.7 and 39 weeks, respectively. We observed a significant association between the presence of IL-6 reverse transcription PCR product and preterm labor (p < 0.01). The test had a positive predictive value of 100% and a negative predictive value of 85%.

**CONCLUSIONS:** Our data suggest that this novel noninvasive technique may provide an alternative means to screen patients for preterm labor.

**324 LONGTERM OUTCOMES OF INFANTS EXPOSED TO MULTIPLE COURSES OF BETAMETHASONE IN-UTERO:** S. Ratmenschl, T.H. Vishne, E.A. Reeces, N. Linder, C. Celentano, M. Glezerman, L. Sirotta. Dept. OB/GYN, Edith Wolfson Med Ctr, Tel Aviv Univ, Israel; Schneider Children’s Hospital, Petah Tiqva; Israel; and Dept. OB/GYN, Temple Univ, USA.

**OBJECTIVE:** Animal studies in multiple species suggest that prolonged steroid exposure in utero impairs somatic and bone growth, and elevates neonatal blood pressure. This is the first study to determine whether recurrent antenatal steroid courses have a similar effect on the long-term development of humans is unknown.

**STUDY DESIGN:** 119 consecutive survivors of preterm delivery were examined at 2.2-6.4 years of age (median 3.5), corrected for prematurity. Mothers of 74 survivors received 1 course (n=45), 2 courses (n=26), or 3 or more courses (n=29) of twice weekly antenatal 12mg betamethasone. At follow-up, birthweight (BW), weight (WT), height (HT), head circumference (HC), systolic (SBP) and diastolic (DBP) blood pressure were converted to standard deviation (SD) scores for age and gender. Offspring of singleton and multiple pregnancies were evaluated separately. Adjustments for multiple comparisons were made. Socioeconomic status, parental education and breastfeeding were controlled for.

**RESULTS:** Singletons

<table>
<thead>
<tr>
<th>No. steroid courses</th>
<th>BW</th>
<th>WT</th>
<th>HT</th>
<th>HC</th>
<th>SBP</th>
<th>DBP</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>-0.268</td>
<td>-0.727</td>
<td>-1.925</td>
<td>-1.522</td>
<td>-0.877</td>
<td>-0.916</td>
</tr>
<tr>
<td>2 or more</td>
<td>-0.267</td>
<td>0.000</td>
<td>-0.650</td>
<td>-1.664</td>
<td>-0.619</td>
<td>-0.582</td>
</tr>
<tr>
<td>3 or more</td>
<td>-0.401</td>
<td>-0.563</td>
<td>-0.766</td>
<td>-1.655</td>
<td>-0.877</td>
<td>-0.749</td>
</tr>
</tbody>
</table>

**RESULTS:** Multiple gestations

<table>
<thead>
<tr>
<th>No. steroid courses</th>
<th>BW</th>
<th>WT</th>
<th>HT</th>
<th>HC</th>
<th>SBP</th>
<th>DBP</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>-0.269</td>
<td>-1.204</td>
<td>-1.833</td>
<td>-1.063</td>
<td>-0.619</td>
<td>-0.582</td>
</tr>
<tr>
<td>2 or more</td>
<td>-0.275</td>
<td>-0.066*</td>
<td>-0.917</td>
<td>-1.032</td>
<td>-1.135*</td>
<td>-1.068</td>
</tr>
<tr>
<td>3 or more</td>
<td>-0.275</td>
<td>-0.171</td>
<td>-1.356</td>
<td>-0.812</td>
<td>-1.661*</td>
<td>-0.992</td>
</tr>
</tbody>
</table>

**RESULTS:** No data in SD scores of normal children of same age and sex; # p<0.05. Sample sizes had >80% power to detect a 1SD difference between unexposed and steroid exposed children in 11 of 12 comparisons.

**CONCLUSIONS:** 1. Antenatal exposure to multiple courses of betamethasone does not impair long-term growth in humans. 2. Systolic and diastolic blood pressures are not elevated in these children. 3. Contrary to our null-hypothesis, increased WT and lower SBP were found in children with multiple gestations and 2 or more courses. We conclude that multiple courses of antenatal steroids have no long-term adverse effect on growth and blood pressure.

**325 INTEGRIN EXPRESSION IN VILLOUS AND EXTRAVILLOUS TROPHOBLAST OF NORMAL AND SPONTANEOUS ABORTED PREGNANcies.** S. Ratmenschl, C. Celentano, D. Kidar, Z. Zahavi, J.N. Bulmer, M. Glezerman. Dept. OB/Gyn, Wolfson Med Ctr and Dept. Pathol., Tel Aviv Univ, Israel; and Dept. Pathol., Univ. of Newcastle, UK.

**OBJECTIVE:** Integrin expression in trophoblast cells appears to play a critical role in implantation and trophoblast invasion of the placental bed. The anchorin structure, membrane localization of cytotrophoblast, and abruption. The control group consisted of patients with a gestational age greater than or equal to 37 weeks at delivery. We collected cervical secretions by swabbing the external cervical os with a Q-tip applicator and total RNA was purified from these samples. Reverse transcription PCR analysis was performed using primers specific for IL-6 and that were scored for the presence or absence of the product. GAPDH served as the positive control for each sample. We tested for significance by Chi square analysis using the Fisher exact test.

**RESULTS:** Intrauterine infusion of LPS at doses ranging from 75 to 1000 ng resulted in fetal death and reabsorption with occasional delivery of 2 dead pups. In contrast, pregnant rats infused with 50 (n=5) or 25 (n=6) µg of LPS experienced preterm birth on day 19 or 20 of gestation. Both saline infusion and sham (arterial catheter only) controls delivered live pups at term. Changes in circulating levels of PGFM in response to varying doses of LPS are given below:

**DISCUSSION:** These results suggest that intrauterine infusion of 25-50 µg of LPS induces delivery and increased levels of PGFM in the peripheral blood. This rat model may clarify the mechanism of infection-induced preterm labor and facilitate development of new tocolytics.
**OBJECTIVE:** To determine whether histologic examination of the placenta could identify possible etiologies for sonographic evidence of cervical shortening between 15 and 24 weeks gestation.  
**STUDY DESIGN:** Women who were at risk for spontaneous pregnancy loss and preterm birth were followed by serial transvaginal cervical sonography with transvaginal ultrasound between 15 and 24 weeks' gestation. Two groups of women were identified; those who developed progressive cervical shortening to below 2 cm, either spontaneously or induced by transcervical pressure, and those who did not. Placental histologic slides were retrospectively examined by a perinatal pathologist who was blinded to the pregnancy outcome. The histologic placental lesions that were examined for were classified as acute or chronic inflammatory lesions, and vascular and coagulation related lesions.  
**RESULTS:** There were 278 women who were followed during the study. The study cohort consisted of 189 pregnancies where the placenta was submitted for histologic examination. Seventy-two developed cervical length <2 cm while 117 maintained cervical length ≥2 cm. 

<table>
<thead>
<tr>
<th>Lesion</th>
<th>Cervical length</th>
<th>Cervical length</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cervical length</td>
<td>Cervical length</td>
</tr>
<tr>
<td></td>
<td>2 cm (n=22)</td>
<td>≥2 cm (n=117)</td>
</tr>
<tr>
<td></td>
<td>Acute inflammatory</td>
<td>35 (48.6%)</td>
</tr>
<tr>
<td></td>
<td>Chronic inflammatory</td>
<td>13 (7.1%)</td>
</tr>
<tr>
<td></td>
<td>Decidual vascular</td>
<td>23 (31.9%)</td>
</tr>
<tr>
<td></td>
<td>Coagulation related</td>
<td>33 (45.5%)</td>
</tr>
</tbody>
</table>

Since acute inflammatory lesions of the placenta were more frequent in those with shortened cervical length, we wanted to determine whether this occurred more frequently with cerclage placement.  

<table>
<thead>
<tr>
<th>Lesion</th>
<th>Bed rest</th>
<th>Cerclage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cervical length</td>
<td>Cervical length</td>
</tr>
<tr>
<td></td>
<td>Cervical length</td>
<td>Cervical length</td>
</tr>
<tr>
<td></td>
<td>2 cm (n=32)</td>
<td>≥2 cm (n=40)</td>
</tr>
<tr>
<td></td>
<td>Acute inflammatory</td>
<td>13 (40.1%)</td>
</tr>
<tr>
<td></td>
<td>Chronic inflammatory</td>
<td>2 (6.3%)</td>
</tr>
<tr>
<td></td>
<td>Decidual vascular</td>
<td>12 (37.5%)</td>
</tr>
<tr>
<td></td>
<td>Coagulation related</td>
<td>16 (50.0%)</td>
</tr>
</tbody>
</table>

CONCLUSION: Acute inflammatory lesions of the placenta were more frequent in those with cervical shortening while decidual vascular lesions were more frequent in those without. Bed rest and cerclage placement in the treatment of cervical shortening did not affect the incidence of histologic placental lesions. The findings suggest that cervical shortening may be related to acute intrauterine inflammation.

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**BACKGROUND/OBJECTIVE:** The "fetal inflammatory response syndrome" (FIRS) has been defined as an elevation of fetal plasma interleukin-6 (FPIL-6). This condition occurs in nearly half of patients with preterm labor (PTL) and intraamniotic infection (IAI). FPIL-6 concentration may be predictive of maternal and/or fetal outcome. The purpose of this study was to determine if PTL leading to preterm delivery—in the absence of infection—is associated with changes in amniotic fluid (AF) concentrations of angiogenin.  
**STUDY DESIGN:** AF was retrieved by amniocentesis. Intrauterine infection was defined as maternal overproduction of this cytokine and its transfer into the fetal circulation, as well as in the amniotic compartment. The purpose of this study was to ascertain whether there was a relationship between funisitis (inflammation of the umbilical cord) and maternal and fetal plasma levels of angiogenin.  
**RESULTS:** Forty-two patients were included in this study; 23 (54.8%) of patients with preterm labor/preterm PROM who underwent amniocentesis and cordocentesis had funisitis (inflammation of the umbilical cord). Of those with PTL and intact membranes and 29.2% (7/24) in patients with PTL leading to preterm delivery.  

<table>
<thead>
<tr>
<th>ActA-No labor (ng/ml)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preterm</td>
<td>6.67 ± 2.13</td>
</tr>
<tr>
<td>Term</td>
<td>22.9 ± 9.2</td>
</tr>
</tbody>
</table>

Significant differences in actA levels between laboring and non-laboring patients, in both groups, remain when controlling for gestational age, maternal weight, age, and parity.  
**CONCLUSION:** Total serum actA levels are significantly higher in both preterm and term laboring patients compared to non-laboring controls of similar gestational age. ActA may prove to be a marker for preterm labor.
331 THE ROLE OF MATERNAL SMOKING AS AN EARLY PREGNANCY PREDICTOR OF PRETERM BIRTH / Gardosi, A Francis*. PRAM, QMC-University Hospital, Nottingham, UK.

OBJECTIVE: Maternal smoking is associated with preterm birth, but also with factors which themselves are related to prematurity, such as maternal age, parity and short stature. We wanted to investigate the relative contributions that factors known at the beginning of pregnancy have on premature births in our population.

STUDY DESIGN: Prospectively collected database of 21,069 singleton deliveries, representing an unselected NHS maternity population. Obstetric history including smoking habit was obtained at the time of the routine mid-trimester scan. Multivariate analysis of significant predictors of preterm birth for primipara and multipara, which were significantly associated with preterm birth.

RESULTS: The table lists prevalence, adjusted relative risk and population attributable risk (PAR) for significant variables known in early pregnancy. Non-European ethnic groups (10.8% of population) had a weak association with prematurity in this population, which did not reach significance in the multivariate analysis.

<table>
<thead>
<tr>
<th></th>
<th>Prevalence %</th>
<th>Relative Risk</th>
<th>PAR %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primipara (43.1%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>age &lt;20 years</td>
<td>15.00</td>
<td>1.39</td>
<td>5.58</td>
</tr>
<tr>
<td>height ≤155 cm</td>
<td>10.59</td>
<td>1.41</td>
<td>4.16</td>
</tr>
<tr>
<td>Multipara (56.9%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>age &lt;20 years</td>
<td>2.37</td>
<td>1.52</td>
<td>1.22</td>
</tr>
<tr>
<td>height ≤155 cm</td>
<td>12.65</td>
<td>1.36</td>
<td>4.55</td>
</tr>
<tr>
<td>weight ≤52 kg</td>
<td>9.36</td>
<td>1.71</td>
<td>6.10</td>
</tr>
<tr>
<td>smoking</td>
<td>26.00</td>
<td>1.76</td>
<td>16.50</td>
</tr>
<tr>
<td>history of abortion</td>
<td>26.43</td>
<td>1.23</td>
<td>5.73</td>
</tr>
<tr>
<td>history of prem delivery</td>
<td>3.66</td>
<td>3.25</td>
<td>7.61</td>
</tr>
</tbody>
</table>

CONCLUSIONS: For multipara, smoking is the strongest early pregnancy predictor of preterm birth. Smoking does not affect preterm delivery rates in primipara, which may be due to a reported protective effect of smoking on preeclampsia.

332 MULTIVARIATE ANALYSIS OF THE EFFECT OF MATERNAL SMOKING ON FETAL GROWTH / Gardosi, A Francis*. PRAM, QMC-University Hospital, Nottingham, UK.

OBJECTIVE: Maternal smoking is linked to small-for-gestational age (SGA) babies, but also with factors which themselves are known to influence birthweight, such as maternal size, age, parity and ethnic group. The aim of this investigation was to determine the independent effect that smoking has on the growth status of the baby.

STUDY DESIGN: The database consisted of 21,069 singleton pregnancies, representing an unselected NHS maternity population. An obstetric history including smoking habit was obtained at the time of the routine mid-trimester scan. Fetal growth restriction (FGR) was defined as birthweight below the tenth customised percentile, after adjustment for gestational age, maternal height, booking weight, parity, ethnic group and sex of the baby.

RESULTS: 24.6% of mothers were smokers, including 14.9% who smoked 10 or more per day. Compared to non-smokers, mothers who smoked were younger (p<0.01), of lower height (p<0.01) and weight at booking (p<0.02), but more likely to be multipara (OR 1.23, CI 1.16-1.32). Babies from pregnancies where the mother smoked were more likely to be SGA at birth (RR 2.28, CI 2.10-2.47), after adjusting for all maternal variables influencing fetal size. In pregnancies where the mother smoked 10+ cigarettes per day, the risk of FGR was even higher (RR 2.49, CI 2.27-2.74).

CONCLUSIONS: Smoking in early pregnancy is associated with fetal growth restriction. This effect is dose related and independent of other maternal characteristics related to diminished fetal growth.

333 PRETERM BIRTH IS NOT ASSOCIATED WITH THE SEX OF THE BABY / Gardosi, A Francis*. PRAM, QMC-University Hospital, Nottingham, UK.

OBJECTIVE: There have been a series of reports showing that preterm birth rates are associated with the sex of the baby. All these studies were based on dating by last menstrual period (LMP). We wanted to test the findings in pregnancies dated by routine ultrasound. We have previously shown that there are no differences in second trimester biparietal diameter (BPD) size between male and female fetuses.

STUDY DESIGN: 20,812 consecutive, singleton pregnancies from a general maternity population, with a specified, 'certain' LMP and routine second trimester scan but otherwise unselected. We used a BPD dating formula previously tested and validated in assisted reproductive pregnancies in our population.

RESULTS: By LMP, the rate of preterm (<37.0 weeks) deliveries was higher in boys: 752 (7.0%) vs girls: 578 (5.8%) (p<0.001, OR 1.21, CI 1.09-1.36). However, by ultrasound dates, the rates are similar for the sexes: 695 boys (6.4%) and 628 girls (6.3%) (p=0.03, OR 1.03, CI 0.92-1.15). The results are similar if only deliveries following spontaneous onset of labour are studied.

CONCLUSIONS: The apparent difference of preterm delivery rate between the sexes is an artifact of gestation dating by LMP. It can be explained by recent reports that males are concieved on average 2 days earlier within the conception cycle. At any LMP-based pregnancy landmark - here 37.0 weeks - male babies will already be on average 2 days older than their female counterparts. This difference disappears if dating by ultrasound fetal biometry is used.

334 EFFECT OF MENSTRUAL DATING ERROR IN THE ASSESSMENT OF GESTATIONAL AGE IN PREMATURE BABIES / Gardosi, A Francis*. PRAM, QMC-University Hospital, Nottingham, UK.

OBJECTIVE: To assess the accuracy of pregnancy dating by specified 'certain' last menstrual period for preterm deliveries.

STUDY DESIGN: Analysis of a database of 23,760 pregnancies with data for two methods of dating: a last menstrual period (LMP) recorded at the first hospital visit, and dates based on a routine second trimester ultrasound scan, with a biparietal diameter measurement between 28mm and 55mm (equivalent to 14 and 21 weeks gestation), used as a standard for comparison.

RESULTS: The rate of preterm delivery <37 weeks was 6.8% by menstrual history and 8.7% by ultrasound dates (p=0.0001). There were fewer preterm births with LMP - scan concordance of dates (within +/-1 week) compared to births at term (58% vs 75%, p<0.0001). Whereas for term deliveries menstrual dates tend to overestimate the true gestation, in preterm deliveries there were more cases where the true gestational age was underestimated by more than a week (27.5%) than overestimated (14.6%). Analysis of deliveries before 32 weeks showed secondary modes of LMP scan error at -4 and +4/9 weeks, suggesting that in some instances, bleeding episodes in early pregnancy may have been mistaken for the LMP.

CONCLUSIONS: Reliance on menstrual dates results in a substantial number of preterm deliveries being misdated, or not even identified as being preterm. Most menstrual dating error at preterm gestations serves towards an underestimating true gestational age. This may result in incorrect assessment and inappropriate decisions in the care of the fetus and the risk of preterm delivery.
337 IS UTERINE ARTERY DOPPLER ASSESSMENT USEFUL IN PREDICTING PRETERM DELIVERY? W.H. Pernia*, J.C. Hobbs, Dept. Of Obstetrics and Gynecology, University of Colorado Health Sciences Center, Denver, CO.

OBJECTIVE: Doppler assessment of the uterine arteries in pregnancy is used in the identification of patients at risk for pre-eclampsia and IUGR. Although abnormalities in uterine artery Doppler (UAD) waveform have been observed during preterm labor, the predictability of UAD in the identification of preterm birth (PTB) before the onset of labor has not been investigated. We conducted the following study to investigate whether abnormal UAD before labor is associated with preterm birth and, if so, to determine if this risk is independent of requisite delivery interventions.

STUDY DESIGN: Between January 1, 1997 and July 1, 1998, we conducted a prospective study of a random sample of patients referred to our Center for ultrasonographic evaluation. The indications for ultrasonographic evaluation of patients recruited into the study were both high and low risk. Most assessments were performed in the later half of pregnancy and both uterine arteries were evaluated with standard pulsed Doppler ultrasound. UAD Resistivity Indices were compared with previous published standards for normality. The gestational age at delivery was obtained from patient records. A statistical comparison was performed using a Chi-square analysis with a p < 0.05 considered significant.

RESULTS: During the study period, 92 patients were considered in this study. Indications for ultrasound evaluation included 'routine' ultrasound in 42 (47%) patients, abnormal triple screen in 25 (27%) patients, and other indications in 25 (27%) patients. Gestational ages at Doppler assessment ranged from 17 to 34 weeks' gestation (mean of 27). The mean interval from assessment to delivery was 8.6 weeks. Bilaterally normal UAD waveforms were observed in 58 (63%) patients and one or both was abnormal in 34 (37%) patients. The rate of preterm birth (<37 weeks) in the normal UAD group was only 10% (6/58) and in the abnormal UAD was 47% (16/34) (p=0.01). Induction of labor for worsening fetal condition was undertaken in only 2 patients with abnormal UAD who delivered early. The mean gestational age at delivery in patients with normal UAD was 39.1 weeks, compared with 37.4 weeks in abnormal UAD patients (p=0.05).

CONCLUSIONS: Abnormal UAD waveforms are predictive of preterm birth, even before the onset of labor. Since UAD waveforms rarely change after 24 weeks, assessment at this time may predict preterm labor long before it ensues.
WEEKLY STEROIDS AS PROPHYLAXIS IN PRETERM DELIVERY: IS THERE MATERNAL ADRENAL SUPPRESSION?

LeSala K, Johnson LM, Dobbis P, Diven MY. Dept. of Ob/Gyn Lenox Hill Hospital, New York, N.Y.

OBJECTIVE: The maternal implications of weekly steroid administration as long term pulmonary prophylaxis in preterm labor are yet to be established. We sought to determine whether the weekly administration of steroids causes maternal adrenal suppression.

STUDY DESIGN: Fourteen patients at risk for preterm delivery formed the study group. We used the following inclusion criteria: 1) administration of at least 3 cycles of weekly steroids (Betamethasone 12.5 mg IM, 2 doses 12 hours apart), 2) no exogenous steroid use for other medical indications, and 3) no known history of adrenal disease. Fourteen low-risk patients of comparable gestational age, who had not received steroids, were used as controls. Serum cortisol levels were obtained between 8 a.m. and 10 a.m. following a standardized breakfast. Student t-test was used for statistical analysis.

RESULTS: There was no statistical difference in mean gestation age at the time of cortisol sampling between the two groups (34.2 ± 3.7 (±SD) weeks and 34.8 ± 4.5 weeks for study and control patients, respectively, p=0.673).

However, a statistically significant decrease in mean morning cortisol level was detected in study patients compared to controls (7.5 ± 7.3 µg/dl vs 29.3 ± 12.7 µg/dl, respectively, p=0.0005). Patients in the study group received between 3 and 6 cycles of steroid prophylaxis with a mode of 3. Cortisol levels were obtained between 2 and 59 days of last steroid dose (mean ± SD of 21.2 ±21.1 days). The greatest effect on cortisol level was seen in patients who were sampled within 20 days of receiving the last cycle of steroids (2.9 ± 1.6 µg/dl vs 11.4 ± 8.2 µg/dl for patients being sampled at ≤20 days or > 20 days, respectively, p <0.05).

CONCLUSION: The results of this study indicate that maternal cortisol levels are profoundly suppressed following weekly steroid prophylaxis. The clinical implications of these findings are yet to be determined.

EFFECTIVENESS OF ANTENATAL STEROIDS: IS MORE BETTER?


OBJECTIVE: The purpose of this study was to compare the effectiveness of single with multiple courses of antenatal steroids (AS) in preterm births. Consecutive neonates weighing ≤1750 gms delivered by mothers exposed to AS between Jan. 1990 and Dec. 1997 at Westchester Medical Center were entered into the study. Neonates exposed to no AS or incomplete single course were excluded. The single and multiple course groups were compared for neonatal morbidity and mortality (RDS, intraventricular hemorrhage (IVH) and periventricular leucomalacia (PVL), major brain lesions (grades 3 and 4 IVH, IVH/PVL, PVL), NEC, PDA and neonatal sepsis and neonatal death). The groups were also compared for gestational age, birth weight, birth weight %, Apgar scores and surfactant exposure. Student T-test, chi-square and Fisher exact tests were used for analysis.

RESULTS: 527 neonates weighing ≥1750g or less were delivered by women whose placenta showed HCA.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>HCA/AS*(n=169)</th>
<th>HCA/AS*(n=358)</th>
<th>Pvalue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gestational Age (wks + SD)</td>
<td>27.8 ± 2.6</td>
<td>27.7 ± 3.4</td>
<td>.70</td>
</tr>
<tr>
<td>Birth weight (g + SD)</td>
<td>1124.7 ± 335</td>
<td>1078 ± 370</td>
<td>.12</td>
</tr>
<tr>
<td>Birth weight %</td>
<td>49.0 ± 22</td>
<td>46.3 ± 22</td>
<td>.09</td>
</tr>
<tr>
<td>5 min Apgar score ≤7</td>
<td>3.8%</td>
<td>3.9%</td>
<td>.91</td>
</tr>
<tr>
<td>PDA</td>
<td>67 (39.6%)</td>
<td>132 (36.9%)</td>
<td>.36</td>
</tr>
<tr>
<td>IVH/PVL</td>
<td>107 (63.5%)</td>
<td>210 (58.7%)</td>
<td>.31</td>
</tr>
<tr>
<td>Major brain lesions</td>
<td>31 (18.3%)</td>
<td>50 (14.3%)</td>
<td>.24</td>
</tr>
<tr>
<td>Necrotizing enterocolitis</td>
<td>10 (5.9%)</td>
<td>22 (6.7%)</td>
<td>.91</td>
</tr>
<tr>
<td>Proven neonatal sepsis</td>
<td>31 (18.3%)</td>
<td>50 (14.3%)</td>
<td>.24</td>
</tr>
<tr>
<td>Neonatal death</td>
<td>14 (8.3%)</td>
<td>58 (16.2%)</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

CONCLUSION: In the presence of HCA, antenatal steroids decrease significantly the incidence of RDS, IVH/PVL, major brain lesion, PDA and neonatal mortality without any increase in proven neonatal sepsis.


OBJECTIVE: Antenatal steroids are contraindicated in the presence of clinical chorioamnionitis (CCA). The effects of antenatal steroids in the presence of histologic chorioamnionitis (HCA) is unknown. The purpose of this study was to determine the effectiveness of antenatal steroids (AS), the reduction of neonatal morbidities and mortality in the setting of HCA.

STUDY DESIGN: Consecutive neonates weighing ≤1750g delivered by women between Jan. 1990 and Dec. 1997 whose placenta showed HCA were included in the study. The study population was stratified according to AS exposure and compared for RDS, intraventricular hemorrhage (IVH) and periventricular leucomalacia (PVL), major brain lesions (grades 3 and 4 IVH, IVH/PVL, PVL), NEC, PDA and neonatal sepsis and neonatal death.

RESULTS: 527 neonates weighing ≥1750g or less were delivered by women whose placenta showed HCA.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>HCA/AS+(n=169)</th>
<th>HCA/AS-(n=358)</th>
<th>Pvalue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gestational Age (wks + SD)</td>
<td>27.8 ± 2.6</td>
<td>27.7 ± 3.4</td>
<td>.70</td>
</tr>
<tr>
<td>Birth weight (g + SD)</td>
<td>1124.7 ± 335</td>
<td>1078 ± 370</td>
<td>.12</td>
</tr>
<tr>
<td>Birth weight %</td>
<td>49.0 ± 22</td>
<td>46.3 ± 22</td>
<td>.09</td>
</tr>
<tr>
<td>5 min Apgar score ≤7</td>
<td>3.8%</td>
<td>3.9%</td>
<td>.91</td>
</tr>
<tr>
<td>PDA</td>
<td>67 (39.6%)</td>
<td>132 (36.9%)</td>
<td>.36</td>
</tr>
<tr>
<td>IVH/PVL</td>
<td>107 (63.5%)</td>
<td>210 (58.7%)</td>
<td>.31</td>
</tr>
<tr>
<td>Major brain lesions</td>
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</tr>
<tr>
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<td>22 (6.7%)</td>
<td>.91</td>
</tr>
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<td>50 (14.3%)</td>
<td>.24</td>
</tr>
<tr>
<td>Neonatal death</td>
<td>14 (8.3%)</td>
<td>58 (16.2%)</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

CONCLUSION: Across all characteristics, there were no differences between groups with regards to AFS, NEC, PDA, HCA or ND.

EFFECTIVENESS OF ANTENATAL STEROIDS: IS MORE BETTER?


OBJECTIVE: The purpose of this study was to compare the effectiveness of single with multiple courses of antenatal steroids (AS) in preterm births. Consecutive neonates weighing ≤1750gms delivered by mothers exposed to AS between Jan. 1990 and Dec. 1997 at Westchester Medical Center were entered into the study. Neonates exposed to no AS or incomplete single course were excluded. The single and multiple course groups were compared for neonatal morbidity and mortality (RDS, IVH/PVL, major brain lesions, NEC, PDA, neonatal sepsis and neonatal death (ND)). The groups were also compared for gestational age, birth weight %, Head circumference%, length%, Ponderal Index, Apgar scores (APS), surfactant, clinical and histologic chorioamnionitis (HCA). Student T-test, Chi-square, Fisher exact test and logistic regression were used for analysis.

RESULTS: 351 neonates ≤1750g were delivered during this period. There were no differences between groups with regards to AFS, NEC, PDA, HCA or ND.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>&gt; 2 courses(n=93)</th>
<th>1 course(n=261)</th>
<th>Pvalue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gestational age (wks + SD)</td>
<td>29.6 ± 2.85</td>
<td>28.7 ± 2.7</td>
<td>.007</td>
</tr>
<tr>
<td>Birth weight (g + SD)</td>
<td>1252 ± 321</td>
<td>1151 ± 339</td>
<td>.03</td>
</tr>
<tr>
<td>Birth weight %</td>
<td>36.7 ± 25.9</td>
<td>39.2 ± 23</td>
<td>.38</td>
</tr>
<tr>
<td>HC %</td>
<td>38.96 ± 31.9</td>
<td>40.1 ± 30.8</td>
<td>.39</td>
</tr>
<tr>
<td>Length %</td>
<td>30.6 ± 31.9</td>
<td>40.8 ± 31.3</td>
<td>.80</td>
</tr>
<tr>
<td>Ponderal Index</td>
<td>2.43 ± 1.3</td>
<td>2.43 ± 1.3</td>
<td>.24</td>
</tr>
<tr>
<td>RDS (%)</td>
<td>17(18.3%)</td>
<td>107(40.9%)</td>
<td>.001</td>
</tr>
<tr>
<td>Surfactant (%)</td>
<td>40(48)</td>
<td>149(57)</td>
<td>.019</td>
</tr>
<tr>
<td>IVH/PVL (%)</td>
<td>21(25.5)</td>
<td>50(30.9)</td>
<td>.64</td>
</tr>
<tr>
<td>Major brain lesions</td>
<td>1(1.1)</td>
<td>15(4.9)</td>
<td>.15</td>
</tr>
<tr>
<td>Proven neonatal sepsis</td>
<td>10(11.7)</td>
<td>35(15.4)</td>
<td>.37</td>
</tr>
</tbody>
</table>

Correcting for confounders with logistic regression, multiple course steroids was significantly associated with a 65% reduction in RDS (OR 0.37, 1.8-70, p=0.005). CONCLUSIONS: Compared to single course, multiple courses of AS significantly reduce the incidence of RDS with no apparent increase in the rate of neonatal sepsis or disturbances in growth. Long term effects of AS are currently being investigated

OBJECTIVE: To determine if there are gender-related differences in perinatal outcomes among neonates weighing 1750g or less at birth.

STUDY DESIGN: Consecutive neonates weighing ≤1750g delivered between Jan 1990 and Dec. 1997 were entered into the study. The study population was stratified according to gender and compared for RDS, intraventricular hemorrhage (IVH), and other outcome measures. Analysis by chi-square, student t-test and Fisher's exact test were used for analysis.

RESULTS: 1260 neonates ≤1750g were delivered during the study period.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Females (n=625)</th>
<th>Males (n=624)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>GA (wk, mean ± SD)</td>
<td>29.0 ± 3.2</td>
<td>28.9 ± 3.3</td>
<td>.62</td>
</tr>
<tr>
<td>Mean birthweight (g, mean ± SD)</td>
<td>1165 ± 364</td>
<td>1092 ± 357</td>
<td>.072</td>
</tr>
<tr>
<td>Birth weight (% ≥ 2SD)</td>
<td>36.8 ± 23.1</td>
<td>41.7 ± 24.3</td>
<td>.0001</td>
</tr>
<tr>
<td>5 min Apgar score &lt;7</td>
<td>148(23.7%)</td>
<td>149(23.9%)</td>
<td>.93</td>
</tr>
<tr>
<td>Surfactant</td>
<td>312(49.9%)</td>
<td>324(51.9%)</td>
<td>.48</td>
</tr>
<tr>
<td>RDS</td>
<td>276(44.2%)</td>
<td>277(44.4%)</td>
<td>.95</td>
</tr>
<tr>
<td>IVH/PVL</td>
<td>150(24%)</td>
<td>185(29.6%)</td>
<td>.02</td>
</tr>
<tr>
<td>Major lesions</td>
<td>80(12.8%)</td>
<td>77(12.3%)</td>
<td>.8</td>
</tr>
<tr>
<td>Necrotizing enterocolitis</td>
<td>24(3.8%)</td>
<td>25(4.0%)</td>
<td>.88</td>
</tr>
<tr>
<td>PDA</td>
<td>53(8.5%)</td>
<td>80(12.8%)</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Antenatal steroids</td>
<td>196(31.4)</td>
<td>210(33.7)</td>
<td>.39</td>
</tr>
<tr>
<td>Proven neonatal sepsis</td>
<td>64(10.6%)</td>
<td>66(10.8%)</td>
<td>.22</td>
</tr>
<tr>
<td>Histologic chorioamnionitis</td>
<td>274(43.8%)</td>
<td>264(40.9%)</td>
<td>.12</td>
</tr>
<tr>
<td>Clinical chorioamnionitis</td>
<td>78(12.5%)</td>
<td>67(10.7%)</td>
<td>.34</td>
</tr>
<tr>
<td>Neonatal death</td>
<td>66(10.6%)</td>
<td>80(12.8%)</td>
<td>.01</td>
</tr>
</tbody>
</table>

CONCLUSIONS: The birth weight% was significantly lower in female neonates while the incidence was higher in males. Previous reported gender differences in RDS rate was not seen probably because of uniform use of antenatal steroids and surfactant.


OBJECTIVE: The initiation to expulsion interval is reportedly shortened in spontaneous fetal death compared to intact pregnancies in mid-trimester terminations with PGE2. However no study has evaluated the effect of pretreatment cardiac puncture with potassium chloride. Our objective was to compare mid-trimester terminations with PGE2, with and without pretreatment cardiac puncture.

STUDY DESIGN: A retrospective chart review of all dinoprostone terminated at <34 weeks’ gestation were randomized to receive 200 mg of either IV or IM dinoprostone. Statistical analysis by student t-test, χ2 test, and Fisher's exact test were used for analysis.

RESULTS: There were no differences between groups with regards to maternal age, weight, parity, race and the use of pretreatment laminaria.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>C/P (n=17)</th>
<th>C/P+ (n=51)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>D &amp; C for retained placenta</td>
<td>3(17.6%)</td>
<td>5(9.8%)</td>
<td>.40</td>
</tr>
<tr>
<td>Structural/Chrom anomalies</td>
<td>15(88.5%)</td>
<td>49(96.1%)</td>
<td>.26</td>
</tr>
<tr>
<td>GA (wk, mean ± SD)</td>
<td>32.1 ± 2.7</td>
<td>29.3 ± 1.4</td>
<td>.001</td>
</tr>
<tr>
<td>Fetal weight (g, mean ± SD)</td>
<td>712 ± 207</td>
<td>849 ± 250</td>
<td>.10</td>
</tr>
<tr>
<td>Cervical exam (cm, mean ± SD)</td>
<td>0.7 ± 0.3</td>
<td>0.7 ± 0.2</td>
<td>.79</td>
</tr>
<tr>
<td>Dates of Progin (mean ± SD)</td>
<td>2.2 ± 0.8</td>
<td>3.7 ± 1.8</td>
<td>.001</td>
</tr>
<tr>
<td>Int to expulsion (mins, mean ± SD)</td>
<td>3792 ± 290</td>
<td>398 ± 643</td>
<td>.001</td>
</tr>
</tbody>
</table>

CONCLUSIONS: Pretreatment cardiac puncture significantly reduces the interval to expulsion and does of dinoprostone required for late mid-trimester terminations.


OBJECTIVE: Recent data have suggested that multiple course corticosteroids may be independently associated with mortality among neonates born at less than 28 weeks gestation.

STUDY DESIGN: We performed a post-hoc analysis of the outcomes of neonates born between 24 and 28 weeks whose mothers were enrolled in the North American multi-center clinical trial of TRH for the prevention of chronic lung disease. In this trial, patients enrolled were in premature labor, and all received at least 1 course of steroids, while the use of weekly steroids was at the discretion of the obstetrician. Cases of neonatal death were defined by the attending obstetricians (i.e., non-deaths) with respect to multiple historical (demographic factors, medical history, social history) and obstetric factors (including steroid courses, tocolytic use, antepartum complications). Multiple logistic regression was used to control for the effects of confounding variables on the association between multiple-dose steroids and mortality. The best regression model was chosen based on model selection criteria.

RESULTS: We identified 82 cases of mortality and 324 controls among neonates born at less than 28 weeks gestation. 70% of neonates were born to mothers who received a single course of corticosteroids, 20.6% 1-2 courses, and 9.4% to 3 or more courses of corticosteroids. After controlling for the effects of other factors, only gestational age at delivery (adjusted OR=0.4, 95% CI 0.2-0.5), multiple gestation (adjusted OR 2.9, 95% CI 1.5-6.2), and 3 or more courses of antenatal corticosteroids (adjusted OR 3.7, 95% CI 1.2-11.6) were independently associated with mortality. The use of specific tocolytic agents, prolonged rupture of membranes, route of delivery, and illicit drug use were not independently associated with mortality.

CONCLUSION: After controlling for the effects of confounding factors, multiple course steroids (greater than 3) was the strongest independent risk factor for death among neonates born at less than 28 weeks gestation.


OBJECTIVE: Vaginal application of indomethacin in preterm labor seems to be more physiologic than rectal plus oral routes. We sought to compare the efficacy and safety of intravaginal versus intrarectal plus oral application of indomethacin for the treatment of preterm labor.

STUDY DESIGN: Between December 1996 and February 1998, eligible patients admitted with singleton pregnancy and idiosyncratic preterm labor at <34 weeks’ gestation were randomized to receive 200 mg of either intravaginal (group 1) or intrarectal plus oral indomethacin (group 2). Estimation of amniotic fluid volume and ductal narrowing were performed. Statistical analysis by student t-test, χ2 test, and Fisher's exact test.

RESULTS: Delivery was delayed >7 days in 18 women (78%) of the vaginally administered group and in only 19 women (43%) of the control group (p=0.03, 95% CI 1:1-2:1:1).

<table>
<thead>
<tr>
<th>Gestational age at delivery (weeksSD)</th>
<th>Birth weight (gSD)</th>
<th>Time in NICU* (daysSD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1 23</td>
<td>25.5z 5.7</td>
<td>33.8± 2.3</td>
</tr>
<tr>
<td>Group 2 25</td>
<td>12.6± 5.7</td>
<td>51.0± 3.3</td>
</tr>
<tr>
<td>p value</td>
<td>0.007</td>
<td>0.01</td>
</tr>
</tbody>
</table>

*NICU - neonatal intensive care unit

CONCLUSION: Intravaginal application of indomethacin is more effective than intrarectal plus oral indomethacin in delaying preterm labor, and it seems to be associated with lower frequency of prematurity-related neonatal complications.
IS DEXAMETHASONE FOR FETAL MATURATION ASSOCIATED WITH DIMINISHED FETAL GROWTH? SL Bloom, JS Sheffield, SM Cox, DM McIntire*, KJ Levine. Dept. Ob/Gyn, Univ. of Tx. Southwestern Medical Ctr, Dallas, Texas.

OBJECTIVE: To test the hypothesis that infants exposed to antenatal corticosteroids are at increased risk for diminished growth.

STUDY DESIGN: A birthweight distribution by completed week of gestation was created for 129,754 singleton livebirths delivered at our hospital. We analyzed the proportion of singleton infants without malformations born below the 5th, 10th, 15th, and 25th percentiles in relation to the number of courses of dexamethasone (Dex) received for fetal maturation compared to both the general obstetric population as well as to those singleton liveborns without malformations who would have been eligible for Dex during the 12 months prior to its actual introduction (before Dex group). Chi-square was used for analysis.

RESULTS:

<table>
<thead>
<tr>
<th>Dexamethasone Course</th>
<th>5th tile</th>
<th>10th tile</th>
<th>15th tile</th>
<th>25th tile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before Dex</td>
<td>20(5)</td>
<td>36(10)</td>
<td>56(15)</td>
<td>99(27)</td>
</tr>
<tr>
<td>Partial (1-3 doses)</td>
<td>370</td>
<td>12(3)</td>
<td>35(9)</td>
<td>53(14)</td>
</tr>
<tr>
<td>1 course</td>
<td>186</td>
<td>13(7)</td>
<td>29(16)*</td>
<td>41(22)*</td>
</tr>
<tr>
<td>≥2 courses</td>
<td>141</td>
<td>5(6)</td>
<td>13(9)</td>
<td>29(21)</td>
</tr>
</tbody>
</table>

* P<.05 (2-tailed)

CONCLUSIONS: One or more completed courses of Dex given for fetal maturation was associated with decreased birthweight for gestational age.

COMPARISON OF FETAL FIBRONECTIN AND HOME UTERINE MONITORING AS PREDICTORS OF PRETERM DELIVERY IN TWIN GESTATIONS. M. Ramirez, M. Turrentine*, Department of Obstetrics and Gynecology, MacGregor Medical Association, Houston, TX.

OBJECTIVE: To compare fetal fibronectin (fFN) and Home Uterine Monitoring (HUAM) as predictors of preterm delivery in twin gestations.

STUDY DESIGN: All twin pregnancies (N=65) from March 1997 to July 1998 were followed in a clinical pathway that included twice a day HUAM and fFN (every 2 weeks) from 24 through 34 weeks of gestation. Results of fFN were available within 24 hours and were positive if > 50 ng/ml. HUAM was positive if greater than 4 contractions per hour. Positive results were available to primary physician for institution of weekly visits, bed rest, and consideration of corticosteroid administration.

RESULTS: 41.5% of all twin delivered preterm (less than 36 weeks). The mean gestational age at delivery was 35.7 ± 2.7 weeks. 18 patients had positive fFN for a positive predictive value (PPV) of 81.3%, and negative predictive value (NPV) of 71.4%. All deliveries less than 32 weeks of gestation were identified by fFN. HUAM had a PPV 52% and a NPV of 100%. The joint test improved the PPV to 86.7 but decrease the NPV to 52.6%.

CONCLUSION: fFN is an acceptable marker of preterm delivery in twins. The high PPV aids in the identification of patients at higher risk of preterm delivery therefore allowing implementation of selective therapies that may aid in reducing morbidity. The addition of HUAM does improve the PPV significantly despite the additional costs of monitoring to the patient and health care provider.

NEUTROPHIL COUNTS IN NEONATES EXPOSED TO REPEATED COURSES OF ANTENATAL STEROIDS KA Boggess, and AP Murtha. Dept of Ob/Gyn Duke Univ Medical Center Durham NC.

OBJECTIVE: Steroids have been associated with white cell demargination, as well as possible immune dysfunction. We sought to determine the effect of repeated courses of antenatal steroids on neonatal neutrophil counts.

STUDY DESIGN: A prospective cohort study was conducted on neonates born to mothers who received > 1 course of antenatal steroids (two IM injections of 12.5mg betamethasone given 24 hours apart) (n=21) and neonates exposed to a single course of antenatal steroids (n=21). Automated white blood cell counts (WBC) with manual differential counts were obtained on admission to the nursery. Placentas were examined histologically for chorioamnionitis. Neonatal sepsis was defined as a positive blood or cerebrospinal fluid culture.

RESULTS: Without histologic chorioamnionitis, there was a significantly higher WBC in neonates exposed to multiple courses of steroids, when compared to neonates who received only one course (12.4 ± 2.5 vs. 8.7 ± 4.0, p<.05). There was no significant difference in band counts. In the presence of histologic chorioamnionitis, there was no significant difference in WBC between the two groups (19±4.9 vs.14±4.1, p=.41), but there was a greater number of bands in neonates exposed to multiple courses (19±1.1 vs. 11±1.4 vs. 7±8 ± 4.1, p=.05). There were 2 cases of neonatal sepsis.

CONCLUSION: In the absence of histologic chorioamnionitis, neonates exposed to multiple courses of antenatal steroids demonstrate neutrophilia, but not bandemia. With histologic chorioamnionitis, the immune response may be enhanced following multiple steroid courses, as evidenced by an increase in band count seen with histologic chorioamnionitis. The relationship between antenatal exposure to steroids and neonatal sepsis needs to be clarified in a larger study.


OBJECTIVE: We have previously described, during the first trimester, a correlation between the starting number of embryos and discordancy of embryo size. Here, we evaluate the significance of discordancy with gestational age at delivery of the remaining fetuses following MFPR.

STUDY DESIGN: 254 consecutive, completed MFPR cases, were analyzed from our database. Two way ANOVA was used to assess the relationship between the degree of discordancy in embryo size as measured by either the greater difference in CRL (Δmax) or the average CRL difference (Δavg), and the pregnancy outcome. Chi square was used to assess the range of Δavg and Δmax compared to pregnancy outcome.

RESULTS: Size discordancy is related to the gestational age at delivery of the remaining fetuses after MFPR. 70% of woman who delivered at 25+ weeks had a first trimester Δmax of 5 or more (p<.05).

| N | Δmax range | 25-28% | 29-33% | 33-36% | 37+%
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>94</td>
<td>0-2</td>
<td>20</td>
<td>47.1</td>
<td>35.7</td>
<td>7.2</td>
</tr>
<tr>
<td>86</td>
<td>3-4</td>
<td>10</td>
<td>35.3</td>
<td>36.5</td>
<td>33.3</td>
</tr>
<tr>
<td>72</td>
<td>&gt;5</td>
<td>70</td>
<td>17.6</td>
<td>27.8</td>
<td>29.0</td>
</tr>
</tbody>
</table>

Δ average and Δmax did not vary with fetal number (P>0.05), but did increase with gestational age.

CONCLUSION: Variation in fetal growth is observable even in the first trimester, and these data are predictive of late pregnancy outcomes. Prior to MFPR in which the smaller, or smallest, of embryos is usually resected, the growth curve of the remaining embryos after reduction may be influenced by the intrauterine environment during the early first trimester before the MFPR. Heightened awareness may be warranted when Δmax is 5 or more as there is increased risk of preterm delivery < 28 weeks, and the morbidity and mortality it encompasses.
351 NEONATAL COMPLICATIONS ASSOCIATED WITH INDOMETHACIN TOCOLYSIS IN VERY PRETERM INFANTS. S. Verrilliaux, R. Newman. Department of Obstetrics and Gynecology, Medical University of South Carolina, Charleston, SC.

OBJECTIVE: To determine if exposure to indomethacin immediately prior to delivery is associated with increased neonatal complications in infants delivered before 32 weeks gestation.

STUDY DESIGN: We performed a retrospective matched cohort study of infants delivered between 24 and 32 weeks gestation after maternal indomethacin treatment for preterm labor. All infants were delivered within 48 hours of gestational age at delivery, betamethasone exposure >24 hours prior to delivery, magnesium sulfate use, fetal number, mode of delivery, infant sex, and race. Data were analyzed using chi square analysis, Fisher’s exact and Yates’ correction tests.

RESULTS: The mean gestational age at delivery was 28.7±2.5 (x±SD) weeks in the indomethacin group and 28.3±2.1 weeks for the controls. Mean birthweights were 1121±243 (x±SD) grams and 1141±287 grams respectively. All infants received magnesium sulfate and betamethasone prior to delivery. The median total dose of indomethacin was 359 mg. The median interval from last dose of indomethacin until delivery was 12 hours. There were no significant differences in the incidence of Mediastinal or Pericardial effusion (1.3, 0.31-3.84) (OR, 95% CI), grade 3-4 intraventricular hemorrhage (0.48, 0.19-1.19), patent ductus arteriosus (1.07, 0.41-2.70), bronchopulmonary dysplasia (0.97, 0.49-1.91), pulmonary hypertension (0.49, 0.02-4.80), anuria (1.21, 0.22-6.01), thoracic aortic aneuhrsm (1.14, 0.53-2.42), sepsis (1.21, 0.22-6.01), or neonatal death (1.34, 0.53-3.25) between groups.

CONCLUSIONS: Maternal indomethacin exposure within 48 hours of delivery was not associated with an increase in neonatal complications to infants delivered between 24 and 32 weeks gestation.

352 IS CESAREAN SECTION PROTECTIVE FOR ADVERSE NEONATAL NEUROLOGICAL OUTCOME IN PRETERM DELIVERY DUE TO CHORIOAMNIONITIS? S. Ozuzu-Gronowska, A. Sameloff, M. S. Schimme, R. RabinoWitch, S. Gitan. Deps. of Oh/Gyn, and Neonatology, Shaare Zedek Medical Center, Jerusalem, Israel.

OBJECTIVE: Intrauterine infection has been identified as a risk for neonatal white matter brain damage and subsequent cerebral palsy. Our hypothesis was that cesarean delivery (CS) is protective for the adverse neurological outcome.

PATIENTS AND METHODS: Included were 64 neonates (24-35 weeks) born in our center (1990-1993) to 56 women with chorioamnionitis. In all cases vaginal delivery was attempted. Adverse neurological outcomes assessed by serial cranial ultrasound (i.e. grade III/IV intraventricular hemorrhage, periventricular leukomalacia and porencephalic lesions) were analyzed by mode of delivery (CS group 1) vs. vaginal delivery (group 2).

RESULTS: Of the 64 infants, 59 (92%) survived the first week. Thirty babies (51%) were born by CS and 29 (49%) were delivered vaginally. The two groups were comparable regarding maternal and perinatal characteristics. In particular there was no difference in the mean gestational age at delivery and birth weight. Adverse neurological outcome developed in 8/30 (26%) of the CS group and in 8/29 (27%) of the VD group (ns). Analysis of the neonates with adverse neurological outcome who underwent CS without labor did not differ from those with a period of labor before surgery.

CONCLUSION: Cesarean section does not appear to be protective for adverse neurological outcome in preterm delivery due to chorioamnionitis.

353 PROTEASE INHIBITORS: IS PRETERM DELIVERY A RISK? M. O'Sullivan, G. Scott, S. Yasin, C. Mitchell, W. Scott, M. Duthely. Dept. OB/GYN/Pediatric Immunology, Univ of Miami/Jackson Memorial Hospital, Miami, FL.

OBJECTIVE: To determine the rate of preterm infants (PT) between 12-23 weeks gestation. STUDY DESIGN: Retrospective analysis of all infants born between 1/1/95 and 3/31/98 who received PIs in pregnancy. Analysis included linear and logistic regression and chi-square calculation.

RESULTS: Of the 169 singleton deliveries, 156 were >23 weeks GA at delivery. ARVs were used by 54%: 5.8% received single dose drug, usually AZT; 30% took combinations without PI (C-PI); 10% took combination PI therapy (C+PI). Although the number receiving PIs was small (16), there was a trend toward PT delivery with a mean GA of 36.5±3.5 weeks vs. 38.2±3.5 weeks without PIs (p=0.05). However, BW was significantly reduced on PIs 2555.6±796.57 grams vs. 3111.7±621.41 grams without PIs (p=0.02).

CONCLUSIONS: As increasing drug combinations are used to treat HIV-1 infected women, caution should be exercised in drug selection during pregnancy. Studies are underway to assess the safety and pharmacokinetics of PIs in combination in pregnant women and their neonates. Our data suggests a significantly lower BW and a trend toward PT delivery.


OBJECTIVE: To determine whether extremes of body mass index (BMI) in pregnancy correlate with preterm delivery.

STUDY DESIGN: Retrospective analysis of all obstetric patients at Stony Brook University Medical Center at Stony Brook delivered between 1/1/95 and 3/31/98 given the introduction of combination antiretroviral (ART) therapy including PIs. Two tailed T test was used for gestational age (GA) and birth weight (BW).

RESULTS: Of the 150 singleton deliveries, 156 were >23 weeks GA at delivery. ARVs were used by 54%: 5.8% received single dose drug, usually AZT; 30% took combinations without PI (C-PI); 10% took combination PI therapy (C+PI). Although the number receiving PIs was small (16), there was a trend toward PT delivery with a mean GA of 36.5±3.5 weeks vs. 38.2±3.5 weeks without PIs (p=0.05). However, BW was significantly reduced on PIs 2555.6±796.57 grams vs. 3111.7±621.41 grams without PIs (p=0.02).

CONCLUSIONS: As increasing drug combinations are used to treat HIV-1 infected women, caution should be exercised in drug selection during pregnancy. Studies are underway to assess the safety and pharmacokinetics of PIs in combination in pregnant women and their neonates. Our data suggests a significantly lower BW and a trend toward PT delivery.
356 CORD-BLOOD IONIZED MAGNESIUM ([iMg]) EXCEEDS MATERNAL LEVELS IN BOTH UNTREATED AND TOCOLYTIC MAGNESIUM SULFATE TREATED PRETERM NEONATES. PG Pryde,1 M Borg,1 R Mittendorf,1 RJ Elin,1,2 Dept of Ob/Gyn, U of Chicago, Chicago, IL1, U of Wisconsin, Madison, WI2, Dept of Path/Lab Med, U of Louisville, Louisville, KY3 OBJECTIVE: Recent data raise concern about possible fetotoxicity of tocolytic magnesium sulfate. Previous studies, in preeclampsia, suggest that fetal ionized (bioactive) magnesium parallels maternal levels. We determined the effects of tocolytic magnesium therapy on maternal venous and neonatal umbilical cord ionized magnesium ([iMg]) in the setting of spontaneous preterm delivery.

STUDY DESIGN: Thirty-six preterm laboring patients and their premature newborns were studied. Eighteen patients (12 singleton and 6 sets of twins) were treated with tocolytic magnesium, and 18 (17 singleton and a single set of twins) were treated with other, or no, tocolytic therapy. Delivery maternal venous and fetal cord-blood samples were collected. Samples were analyzed for [iMg] and total magnesium using the AVL (Graz, Austria) 988-4 analyzer. Groups were compared using Mann-Whitney and Wilcoxon Signed Ranks Tests.

RESULTS: Of the 226 neonates included in the study, 107 were exposed to MgSO4 therapy prenatally and 119 were not. Mean ± SD gestational age at delivery (29.6 ± 5.2 vs 31.4 ± 4.0 wks, p<0.001) and birth weight (1584 ± 570 vs 1665 ± 713 g, p<0.001), as well as neonatal serum Mg level (4.1±1.3 mg/dl vs 0.99 ± 0.43, p<0.001), and rates of preeclampsia (14% vs 8%, p=0.09) and perinatal labor (73% vs 91%, p=0.001) were significantly higher among neonates exposed ante partum to MgSO4 therapy. The rates of neonatal intrapartum (5% vs 4%, p<0.05), term deliveries (51% vs 28%, p<0.05), PROM (22% vs 33%, p=0.07), Cesarean delivery (72% vs 61%, p=0.12), and male neonate (51% vs 51%, p=1.0) were similar between the two groups. Similar proportions of neonates developed NEC among those exposed to antenatal MgSO4 therapy (2.8% vs 3.0%).

CONCLUSIONS: In our cohort group of preterm neonates, antepartum MgSO4 therapy did not affect the incidence of NEC. Use of power analysis, 2,312 patients would be required in each group to show a significant association between antenatal MgSO4 therapy and neonatal NEC (p=0.05).
1 NEC □□ a sigmficant he two groups r0, p=0.12), a (14% gestational weight (~1354~
11), death <24
fissmns.

## EVALUATION OF A PANEL OF CYTOKINES, CHEMOKINES, NEU-
## KINEPEPTIDES IN A SINGLE ALIQUOT OF MIDTRIMESTER AMNI-
## OTIC FLUID IN THE PREDICTION OF FETAL GROWTH RESTRI-
## CTION

**OBJECTIVE:** Previous studies have evaluated mid trimester amniotic fluid (AF) cytokines as markers for preterm delivery and fetal growth restriction (FGR) with the premise that post-implantation events affect pregnancy outcome. However, the studies evaluated single cytokines. Since cytokines work in a cascade and have significant redundancy, we determined the levels of multiple cytokines/growth factors (IL-1, IL-2, IL-3, IL-6, IL-9, IL-10, TNF-α, M-CSF, MCP, β-FGF, VEGF, angio) chemokines (MIP-1α, RANTES), and neuropeptides (VIP, PACAP) in a single sample of AF.

**STUDY DESIGN:** Patients who underwent mid trimester amniocentesis and delivered a FGR neonate (birthweight <10% for gest. age) were matched with controls based on year of amniocentesis, gestational age, and race. AF samples were stored at -70°C. A protein assay was performed and AF was normalized to 1 ng/mL. Using immunoaffinity capillary electrophoresis, recombinant human cytokines were analyzed and standard curves derived, followed by the quantitation of the analyte of interest in unknown AF samples. Cytokine values were log transformed for statistical analysis including Student’s t-test and stepwise regression analysis with P<.05.

**RESULTS:** Multiple cytokines/growth factors were significantly elevated in the FGR amniotic fluid, (TNF-α, MCP, VEGF, angio), as were chemokines (MIP-1α), and neuropeptides (VIP, PACAP), all P<.001. Stepwise regression analysis demonstrated that MCP had the greatest prediction of FGR.

**CONCLUSIONS:** Markers are present in asymptomatic patient’s mid trimester AF which may predict and give an understanding to pregnancy outcome. Idiopathic FGR is a heterogeneous condition; however, specific patterns of analytes in mid trimester fluid may allow an improved understanding of specific FGR subsets.

## DELIVERY OF THE MARGINALY PRETERM INFANT; WHAT ARE THE SOFTER MORBIDITIES?

**OBJECTIVE:** To determine the morbidity associated with premature delivery between 32-36 weeks gestation.

**STUDY DESIGN:** A retrospective analysis of infants delivering between 32-36 weeks gestational age at our hospital during 1997 was undertaken. Charts were abstracted for maternal demographics, medical history, administration of medicaments, and pregnancy complications. Neonatal data and outcomes including presence of feeding difficulties, hyperthermia, hyperbilirubinemia, NEC or IVH and the need for NICU admission or ventilator support were also collected. Chi square analysis was conducted and significance determined; p<0.05. Cutpoints were used to determine the gestational age at which no further increased risk of a specific complication occurred.

**RESULTS:** 524 patients were identified as delivering during the study period, 30 infants with major congenital anomalies were excluded.

<table>
<thead>
<tr>
<th>WEEKS</th>
<th>N=35</th>
<th>N=68</th>
<th>N=94</th>
<th>N=142</th>
<th>N=182</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feed</td>
<td>68.6%</td>
<td>42.6%</td>
<td>31.9%</td>
<td>14.1%</td>
<td>9.5%</td>
</tr>
<tr>
<td>Bili</td>
<td>42.9%</td>
<td>35.8%</td>
<td>19.4%</td>
<td>11.2%</td>
<td>5.5%</td>
</tr>
<tr>
<td>NICU</td>
<td>71.4%</td>
<td>50.0%</td>
<td>33.9%</td>
<td>23.8%</td>
<td>12.1%</td>
</tr>
<tr>
<td>Vent</td>
<td>31.4%</td>
<td>19.1%</td>
<td>13.8%</td>
<td>7.0%</td>
<td>7.7%</td>
</tr>
</tbody>
</table>

Delivery at 34 weeks resulted in no significant increase in NICU admissions (p<0.04). Optimal gestational age to avoid feeding difficulties was 35 weeks (p<0.001) and the incidence of hyperthermia was not increased if delivery occurred at 36 weeks (p<0.05). Delivery after 35 weeks gestation did not prolong neonatal hospitalization.

**CONCLUSIONS:** While it is known the incidence of major morbidities declines after 32 weeks, softer morbidities persist at increased frequencies until 35-36 weeks. These may add significantly to neonatal hospital time and cost and should be considered in the risk/benefit analysis before undertaking delivery in the marginally preterm infant.

## PERINATAL RISK FACTORS FOR CRANIAL ULTRASOUND ABNOR-
## MALITIES AFTER PRETERM BIRTH BEFORE 34 WEEKS.

**OBJECTIVE:** To investigate which antenatal variables are related to the occurrence of large intraventricular hemorrhage (IVH) and cystic periventricular leucomalacia (PVL) in neonates with a normal birthweight (AGA).

**STUDY DESIGN:** Retrospective. Included: neonates, singletons and twins, without congenital anomalies born between 168-238 days after spontaneous preterm labor with or without PROM. Excluded: neonates not admitted to the NICU, higher order gestations, elective delivery because of growth restriction, maternal disease or abruptio placenta or placenta praevia. Prenatal variables: tocolysis, corticosteroids, antibiotics (ante/postnatal), duration of ROM, intrauterine infection, mode of delivery: gestational age, weight, Agarscore, early onset infection, assisted ventilation and duration. Abnormal ultrasound:IVH Grade III and IV according to Papile or PVL Grade II and III according to de Vries.

**STATISTICH:** Stepward forward logistic regression. Results: 207 neonates fulfilled to the entry criteria of which 16 died. The incidence of abnormal ultrasound was 13%. Three factors appeared to be independently related to the occurrence of abnormal ultrasound findings: gestational age (0.96 95% CI 0.92 - 0.99), a course of antenatal steroids (OR 0.33 95% CI 0.15 - 0.68) and an ear onset infection (OR 3.09 95% CI 1.24 - 7.70).

**CONCLUSION:** Neat attempts to prolong gestation and the administration of steroids after term birth a more liberal use of antenatal antibiotics to prevent early onset infection may be helpful in preventing early neonatal neurological damage.
363 THE ASSOCIATION OF INTERPREGNANCY INTERVALS AND PRETERM BIRTHS. T. T. Huash, W. Y. Shau*, T. H. Hung*. Dept. Ob/Gyn, Chang Gung Memorial Hospital, Taipei, Taiwan

OBJECTIVE: Our purpose was to examine the association of interpregnancy interval and preterm birth in a large hospital-based cohort and try to propose a hypothetical critical interval to indicate the threshold for a significant increase in the prevalence of preterm birth.

STUDY DESIGN: Follow-up of a cohort of women with complete obstetric records delivering singleton infants between January 1971 and December 1997 were included. We related the frequency of preterm birth (gestational age less than 37 weeks) of the second of any pair of consecutive pregnancies to the interval between the pair. Multiple logistic regression with adjustment for potential confounding factors was used for statistical analysis.

RESULTS: The adjusted odds ratio for preterm birth was 1.60 (95% confidence interval [CI] 1.21, 2.11) for an interpregnancy interval less than 6 months, then decreased with a ratio of 0.77 (95% CI, 0.62, 0.95) at a 12-month interval thereafter. Such protective effect due to prolongation of the interpregnancy interval faded at intervals between 24 and 36 months.

CONCLUSIONS: The interval between two pregnancies was inversely related to the risk of preterm birth. This risk was significantly decreased with an interpregnancy interval of at least 24 months, thus should be taken into account when planning a new pregnancy.


OBJECTIVE: Since October 1995, our institution has used Indomethacin (Indo) as our first line tocolytic drug. Our purpose is to compare the outcomes of very low birth weight (VLBW) (<1500g) infants who were exposed to antenatal Indo with those who were not exposed to this therapy.

STUDY DESIGN: We used our institution's data base of VLBW infants, which recorded the outcomes of all live born infants weighing <1500g from 1990-1995. Data were extracted from Developmental Assessment, Pathology and McGill Obstetrics & Neonatal Database Records. Neurological outcome was classified using standard psychomotor and cognitive testing at 16 months and 3 years.

RESULTS: Infants with placental evidence of hypoxia were almost 9 times more likely to have abnormal neurological outcome (OR 8.6, CI 1.0-72.6). Abnormal fetal heart rate was also significantly associated with abnormal outcome (OR 4.3, CI 1.1-17.5) while the presence of meconium in amniotic fluid was associated with outcome (OR 0.1, CI 0.03-1.0). Magnesium sulfate tocolysis was also inversely associated with neurological findings (OR 0.1, CI 0.03-0.6). Maternal smoking, birthweight, and 5-minute Apgar score, mechanical ventilation at birth and abnormal cord insertion were not associated with long-term neurological outcome.

CONCLUSIONS: Placental evidence of hypoxia was strongly associated with adverse neurological outcome as was abnormal fetal heart rate. Birthweight ratio and indicators of acute hypoxia were not associated with long-term outcome. Magnesium sulfate tocolysis had a possible protective effect for neurological deficit in extremely premature infants.


OBJECTIVE: Previous work has shown that very low birthweight, which may indicate chronic hypoxia, is a strong predictor of cerebral palsy. Cognitive and motor deficits are commonly associated with extremely premature delivery. We examined the association between perinatal indicators of both chronic and acute hypoxia and neurological outcome in extremely premature infants.

STUDY DESIGN: Cohort study of 84 extremely premature infants (28 weeks) referred for long-term follow-up in 1990-1995. Data were extracted from Developmental Assessment, Pathology and McGill Obstetrics & Neonatal Database Records.

RESULTS: Evidence of placental infection was associated with abnormal neurological outcome (OR 7.1, CI 0.7-77.0) as was antepartum maternal temperature of >38.5° (OR 5.8, CI 0.7-45.5), not statistically significant. Abnormal fetal heart rate was over 4 times more likely to be associated with neurological deficit (OR 4.3, CI 1.1-17.5). Meconium was inversely associated with abnormal long-term outcome (OR 0.1, CI 0.03-1.0). Admission-delivery interval, duration of membrane rupture, antepartum pyrexia, intraterine/other infection, admission-delivery interval, tocolysis, cerebral palsy, abnormal neurologic deficits, and magnesium sulfate had a possible protective effect on neurological deficit in extremely premature infants. Other perinatal indicators of infection were not associated with long-term neurological outcome.
**357** THE CLINICAL SIGNIFICANCE OF HYDRAMNIOSES AND SMALL FOR GESTATIONAL AGE, S. Larbi, B. Furman, L. Senior, L. Shoaib-Varadi, J. Bar-David, E. Maymon, M. Mazor. Dept. of Obst./Gyn and the Epidemiology Unit, Soroka Medical Center, Faculty of Health Sciences, Ben-Gurion University of the Negev, Beer-Sheva, Israel.

**OBJECTIVE:** To investigate the clinical significance of hydramnios and small for gestational age (SGA) as a predictor of peripartum complications and intrapartum morbidity.

**STUDY DESIGN:** We compared the 152 SGA neonates with hydramnios (hydramnios/SGA) to a sample of 1% of the AGA neonates with normal amniotic fluid (normal AF/AGA) (582 cases). Statistical analysis was conducted with SPSS package for the entire cohort as well as for the cohort excluding from each group all cases with congenital malformations.

**RESULTS:** The prevalence of hydramnios and SGA was 0.2% (152/70896). There was a significantly higher rate of congenital anomalies in the hydramnios/SGA group compared to normal AF/AGA group 25% vs. 2.4%, respectively (p<0.001). There were significantly more previous perinatal death and diabetes class B-R among the hydramnios/SGA group than among normal AF/AGA group; 10.5% vs 5%, (p<0.001); 2% vs. 0.3%, (p<0.05). These findings remained significant also after exclusion of the neonates with congenital malformations. The rates of labor dystocia, placental abruption, abnormal presentations, prolapse of cord and Cesarean section were significantly higher in the hydramnios/SGA group (5.9% vs. 2.4%, p<0.05; 5.9% vs. 0.7%, p<0.01; 14.5% vs. 3.2%, p<0.001; 2% vs.0.2%, p<0.01; 24.3% vs. 8.2%, p<0.001, respectively). Rates of APD and PPH as well as low and 5 min Apgars scores were significantly higher in the hydramnios/SGA group (9.2% vs.13%: 14.5% vs.6.3%: 12.8% vs.2.1%; 11.7% vs. 0.6%, respectively (p<0.01)).

**CONCLUSIONS:** The combination of hydramnios and SGA is a risk factor for peripartum complications and perinatal mortality even in the absence of congenital malformations.

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**358** PERINATAL OUTCOME IN PRETERM TWIN DELIVERIES, B. Furman, M. Maymon, L. Shoaib-Varadi, H. Vardi, E. Maymon, M. Mazor. Dept. of Obst./Gyn and the Epidemiology Unit, Soroka Medical Center, Faculty of Health Sciences, Ben-Gurion University of the Negev, Beer-Sheva, Israel.

**OBJECTIVE:** The aim of the present study was to compare perinatal outcome and peripartum complications between twins and singletons, born preterm.

**STUDY DESIGN:** The study population consisted of preterm deliveries of 435 pairs of twins (870 neonates) and the comparison group included 4754 singletons born in the same period. Exclusion criteria were births following infertility treatments. Statistical analysis consisted of 1) degree of concordance between the twins; 2) comparison between each of I (AGA) and II (SGA) to their singleton comparison groups using SPSS computer program; and 3) stratified analysis to examine perinatal mortality rates at different gestational age groups.

**RESULTS:** The prevalence of preterm deliveries was 7.9% (6192/77610).

- Perinatal mortality was lower in twins of both birth orders; however, it was statistically significant only when APD is considered. Mortality rates in all gestational age groups and for both twin groups were lower than that of singleton (OR=0.45 (0.26-0.75); 95% CI) for twin-I; OR=0.36 (0.21-0.59; 95% CI) for twin-II).

- Compared to singletons, twin gestations had less congenital malformations. Twin gestations had statistically lower rates of PROM, severe PIH, oligohydramnios, placenta previa, placental abruption and clinical chorioamnionitis (12.2% vs 17.3%; 2.5% vs. 6.3%; 2.3% vs. 4.7%; 0.9% vs. 2.9%; 1.8% vs. 5%; 1.8% vs. 5.2%, respectively (p<0.01)).

- Mothers of twins had less diabetes mellitus class B-R, hydramnios and chronic hypertension than that of singleton (1.8% vs. 2.0%, 5.5% vs. 7.4%, 5.7% vs. 4.8%, respectively).

**CONCLUSIONS:** Perinatal mortality rates and peripartum complications were lower in twin compared to singleton gestations.

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**359** DOES A PRIOR CESAREAN DELIVERY INCREASE THE RISK OF A COMPLICATION FOR WOMEN UNDERGOING A MIDTRIMESTER PREGNANCY TERMINATION? S. Larbi, J. Van Rooyen, C.S. Shih, M.C. Frederiksen. Dept. Obst./Gyn, Northwestern Memorial Hospital/ Northwestern University Medical School, Chicago, IL.

**OBJECTIVE:** To determine whether a prior cesarean delivery increases the risk of a complication when undergoing a midtrimester pregnancy termination by either D&E or labor induction.

**STUDY DESIGN:** All cases of pregnancy termination from 13 to 24 weeks gestation during 1992-96 were reviewed. Complications included: need for blood transfusion, genital tract injury, uterine atony, retained products of conception, and fetal morbidity requiring antibiotics. Results were analyzed with descriptive statistics, Chi-Square test, and logistic regression.

A p value ≤ 0.05 was considered statistically significant.

**RESULTS:** There were 646 women in the study group; 88 patients had a history of prior cesarean delivery (Group I) and 558 patients had no prior cesarean delivery (Group II). Pregnancy termination was by D&E for 561 patients and by labor induction for 85 patients. The mean gestational age was 17.9 ± 2.7 weeks. Complications occurred in 58 patients. A prior cesarean delivery did not statistically affect the incidence of complications: Group I (8/88), Group II (50/558). Using logistic regression to evaluate the effects of gestational age, method of termination, and a prior cesarean delivery on the incidence of complications, only the method used for termination was significant (p<0.001). The odds ratio for a complication in the labor induction group was 1.4 (95% CI (1.1 - 1.8)) as compared with the D&E group.

**CONCLUSIONS:** Women with a prior cesarean delivery are not at higher risk for a complication when undergoing a midtrimester pregnancy termination. The greatest effect on the risk of a complication with a mid trimester pregnancy termination is the method used; D&E is associated with a lower risk of complications than labor induction.

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**OBJECTIVE:** Recent studies have suggested that patients undergoing emergency cervical cerclage may have similar outcomes when compared to patients who have had prophylactic placement. The purpose of this study was to perform a comprehensive evaluation of outcomes for cerclages placed prophylactically and emergently.

**STUDY DESIGN:** Data from 79 patients undergoing prophylactic cerclage and 18 patients receiving emergent cerclage between the years 1994-96 were collected through chart abstraction and retrospectively analyzed. Emergency cerclage was defined as a procedure performed at ≥2 cm dilation and ≥50% effacement. Chi-square analysis and the student’s t-test were used to evaluate the data.

**RESULTS:** There were no differences between the two groups in baseline demographics including maternal age, race, gravidity, parity, and first and second trimester spontaneous or induced abortions. Mean gestational age at placement of cerclage differed significantly between the prophylactic and emergency groups (14.7 vs 19.2 weeks, p<0.0001). Cerclage placement to delivery interval was far greater for patients undergoing prophylactic cerclage (20.8 ± 11.6 weeks, p<0.001). Mean gestational age at delivery differed significantly between the prophylactic and emergency groups (36.4 ± 30.0 weeks, p<0.0001), as did mean birth weight (2975 grams vs 2054 grams, p=0.01). In a subgroup analysis, mean gestational age at delivery differed significantly in patients who had prophylactic vs emergency cerclages placed between 1421 weeks (36.0 ± 31.1 weeks, p=0.008). There was no difference in gestational age at placement of prophylactic cerclage when preterm vs term deliveries were compared (15.2 vs 14.5 weeks, p=0.35). There was no difference in the length of labor between the prophylactic or emergency cerclage groups.

**CONCLUSION:** Gestational age at placement of a prophylactic cerclage did not affect outcome. The indicator for successful outcome for the patients in this study was having the cerclage placed prophylactically rather than emergently. When patients of similar gestational ages (14-21 weeks) in the two groups were compared, prophylactic cerclages did better than emergency cerclages.
371 INTERNAL VERSION AND BREECH EXTRACITION (IVBE) IS A SAFE AND EFFECTIVE METHOD OF DELIVERING THE SECOND TWIN. Levensky E*, Amankwah K, Barter JFR*. University of Toronto, Fetal Diagnosis and Treatment Center, Perinatal Complex, Toronto, Canada.

**OBJECTIVE:** To establish the best method of delivering the non-vertex second twin following vaginal delivery of the first.

**METHOD:** A retrospective review of all planned vaginal twin deliveries after 24 weeks gestation in which the second twin was non-vertex in a University teaching center over the past 5 years.

**RESULTS:** There were 106 non-vertex second twin deliveries. In 96 (90.5%) delivery was attempted by primary IVBE and this was successful in achieving vaginal delivery in all but one patient who was delivered by LSCS for failed IVBE. In 10 (9.4%) patients external cephalic version was attempted. It was successful in 8 (80%) patients resulting in a vertex delivery. In 7 women, ECV failed and secondary IVBE was successful. In the 102 gestations ages were < 32 weeks in 14 (13.7%) patients, 32 - 36 wks in 34 (33.3%) patients and > 36 wks in 54 (52.9%) patients. In these age groups, the average birth weight was 1263g (range 602 - 1840g), 2120g (range 1255 - 3000g), and 2914g (range 1880-3714g) respectively. The mean time interval between the delivery of Twin A and Twin B was 9.5 minutes (range 1 - 30 minutes). Intrapartum complications after delivery of Twin A included cord prolapse in 1 (1.0%) patient, placental abruption in 2 (2.0%) patients and fetal distress in 6 (5.5%) patients. There were 4 (3.9%) infants with a 5 min Apgar score < 7. There were 13 (12.7%) traumatic neonatal events. These included bruising in 12 infants and a femoral fracture in 1 infant. No term infant (> 36 weeks) required NICU admission for more than 24 hours.

Maternal complications included postpartum hemorrhage (EBL > 500ml) in 20 patients (19.6%) and postpartum febrile morbidity and endometritis in 1 patient (1.0%). Maternal and fetal complications occurred equally across all gestations and birth weights.

**CONCLUSION:** This study suggests that IVBE is a very effective method of delivering the non-vertex second twin vaginally including babies < 32 weeks gestation. Across all gestational ages and birth weights the incidence of neonatal complications is very low suggesting that IVBE is the most appropriate mode of delivery for the non-vertex second twin.

372 THE INFLUENCE OF MATERNAL-FETAL MEDICINE SUBSPECIALIZATION ON THE FREQUENCY OF TRIAL OF LABOR IN TERM PREGNANCIES WITH BREECH PRESENTATION. V. Schimpf*, S.C. Blackwell*, S. Hassan*, S. Berman, Y. Sorokin, H. Wolfe. Division of Maternal-Fetal Medicine, Dept. of Ob/Gyn, Hutzel Hospital/Wayne State University, Detroit, MI.

**OBJECTIVE:** The purpose was to assess the role of subspecialization in maternal-fetal medicine (MFM) on the frequency of trial of labor (TOL) in term pregnancies with breech presentation.

**STUDY DESIGN:** Singleton pregnancies ≥ 37 weeks (wks) with non-footing breech presentation that delivered from 5/94 - 5/98 were identified using a computerized perinatal database. Demographic and clinical information were obtained including whether the patient had a TOL, cesarean delivery (CS) without TOL, CS after TOL, or vaginal breech delivery (VB). Patients were divided into two groups based on whether delivery was managed by an MFM or non-MFM Ob/Gyn attending physician. Statistical analysis included discriminant function analysis (DFA) and odds ratio (OR).

**RESULTS:** 392 pregnancies were identified. Maternal age (25.9 ± 6.55 y vs. 26.5 ± 6.0 y), African American race (63.2% vs. 70.1%), staff service (82.8% vs. 89.1%), gestational age (38.8 ± 1.4 wk vs. 38.5 ± 1.4 wk), and birth weight (BW) (3214 ± 562.8 gms vs. 3180.5 ± 560.1 gms) were not significantly different between the two groups. Patients in the MFM group were more likely to be nulliparous (OR 2.1, 95% CI; 1.3-3.5). DFA revealed that only BW and parity affected the likelihood of TOL or CS rates. TOL, VB/TOL, and CS rates were similar in the two groups (table). MFM subspecialization, race, and staff service did not impact these results.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>MFM</th>
<th>Non-MFM</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOL %</td>
<td>29.7</td>
<td>23.1</td>
<td>1.4 (0.9-2.3)</td>
</tr>
<tr>
<td>Successful TOL (VB/TOL)</td>
<td>50.9</td>
<td>61.8</td>
<td>.6 (1.3-1.5)</td>
</tr>
<tr>
<td>Overall CS Rate %</td>
<td>84.7</td>
<td>85.7</td>
<td>.9 (1.5-1.7)</td>
</tr>
</tbody>
</table>

**CONCLUSIONS:** Subspecialization in MFM has no impact on the frequency of TOL in term pregnancies with a breech presentation.

373 PREGNANCY OUTCOME FOLLOWING SUCCESSFUL EXTERNAL CEPHALIC VERSION. D. Suddsau MD, R. Stiller MD, J. Collins CNM*. S Laiyer MD Dept. OB/GYN, Bridgeport Hospital, Bridgeport, CT.

**OBJECTIVE:** Recent studies have suggested that the rate of Cesarean section (C/S) in patients who have undergone a successful External Cephalic Version (ECV) is increased. This study evaluates the incidence of C/S in patients who had undergone a successful ECV as compared to patients with cephalic presentations who had not undergone ECV.

**METHODS:** Using a retrospective case control design, records of 92 patients who had undergone a successful ECV were identified and reviewed. A control population of 184 patients was identified from the delivery log book and consisted of patients who underwent labor with cephalic presentations and delivered immediately before and after the study patients. Hospital charts were reviewed for outcome data and for the presence of other risk factors that may affect C/S rates.

**RESULTS:** There were no significant differences between study and control populations for the following variables: age, parity, payer status, gestational age, incidence of previous C/S, epidural use in labor, use of oxytocin for induction or augmentation of labor, fetal sex, or fetal weight. There was no significant difference in the C/S rate between study patients (22.8%) and control patients (23.4%).

**CONCLUSIONS:** We could not demonstrate a significant increase in the C/S rate for women who have undergone a successful ECV as compared to patients in labor with cephalic presentations. ECV is an effective technique to lower the C/S rate.

374 WITHDRAWN
Seizures

Birth trauma

0 (0%) 0 (0%)

n/s**

n/s**

n/s**

CONCLUSIONS: In this study neonatal outcomes appeared not to be affected by the choice of instruments for operative vaginal delivery. Based on this study, the use of the vacuum extraction for delivery of the premature infant is a reasonable option. Long term follow up studies are required to further evaluate this data.

376 FAILED FORCEPS: THE TIME TO CESAREAN SECTION - HOW LONG IS TOO LONG? Dixon MF, Amankwah K, Barrett JR, University of Toronto, Fetal Diagnostic and Treatment Center, Women's College Hospital.

OBJECTIVE: To analyze the time interval from mid-forceps failure to Cesarean Section that is consistent with safe Obstetric practice.

STUDY DESIGN: A retrospective chart review of all failed forceps occurred in a tertiary care teaching hospital in the year 1997/1998. The time interval from failure of the forceps to delivery of the baby was noted and related to the indication for delivery, and neonatal outcome.

RESULTS: All procedures were done in an OR under epidural anesthesia continuous fetal monitoring, with anesthetic and nursing staff present. There were 30 failed forceps out of 412 deliveries (7%). Twenty Five (84%) were performed for arrest in the second stage, and 18 (60%) of these involved rotation. Five (16%) were performed for fetal distress. The average time interval from failure of the forceps to delivery of the baby was 31.5 min. - ranging from 6 min. to 58 min. The average time for those performed for second stage arrest was 42 min. (20-58 min.), and for those performed for fetal distress was 22 min. (20-26 min). There was no significant neonatal morbidity. All infants in both groups had Apgar scores of >9 at 5 min. One infant in the fetal distress group with a delivery interval of 26 min. had an Apgar of 7 at 5 min and required NICU admission for IV antibiotics. There were no cases of fetal distress induced by the forceps.

CONCLUSION: This is the first evidenced based report on a time interval following failed instrumental delivery associated with excellent neonatal outcome that can be used as a standard in medico-legal reports. It concurs with ACCOG and SOGC guidelines that LSCS should be immediately available in such cases, but suggests that with continuous monitoring, an interval beyond 30 minute delay is consistent with safe practice

377 SAFETY OF A LABOR EPIDURAL IN WOMEN WITH SEVERE PREECLAMPSIA (PE) OR SEVERE PREGNANCY INDUCED HYPERTENSION (PIH). B Hogg for the NICHD MFMU Network, Bethesda, MD.

OBJECTIVE: To determine if epidural anesthesia during labor in women with severe PE or PIH increased the frequency of cesarean section (CS) for fetal and/or maternal indications or the occurrence of major maternal morbidities.

STUDY DESIGN: This retrospective analysis was a subgroup of a multicenter, double-blind, low-dose aspirin trial that included outcome data on 2,503 women at high risk for PE (preexisting diabetes [DM], chronic hypertension [CHTN], multifetal gestation, and previous PE). Severe disease defined as aggravated hypertension (CHTN), severe PIH, severe PE or PE (in the DM and CHTN groups), HELLP syndrome or eclampsia, occurred in 444 women. The primary outcome for this analysis was CS for fetal distress (FD) or CPD.

RESULTS: Of 444 women with severe disease, 327 labored. The CS overall and/or for FD/CPD, or the occurrence of pulmonary edema (PUL), were similar in the women who labored with and without epidural anesthesia. No women had acute renal failure.

<table>
<thead>
<tr>
<th>Severe Disease/Labor</th>
<th>CS (%)</th>
<th>FD/CPD</th>
<th>PUL %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epidual (N=209)</td>
<td>32.1(67)</td>
<td>36.8</td>
<td>2.9</td>
</tr>
<tr>
<td>No epidual (N=118)</td>
<td>28.0(35)</td>
<td>22.0</td>
<td>3.4</td>
</tr>
</tbody>
</table>

In women with severe disease, CS for FD/CPD was similar within each of the four risk groups. Also in women with severe disease with or without labor, any epidural use compared to no epidural use was associated with a similar occurrence of PUL (5.6 vs. 5.4%). In the overall study population, women with severe disease had a significantly higher overall CS rate and for the indications of FD and/or CPD.

CONCLUSION: Epidural anesthesia during labor in women with severe disease did not increase CS rates overall or FD/CPD and did not increase the occurrence of PUL or acute renal failure.
379 UTERINE RUPTURE DURING A TRIAL OF LABOR COMPARED TO A PRIOR LOWER SEGMENT VERTICAL INCISION TO A LOWER SEGMENT TRANSVERSE INCISION. T. Steppe, C. Zelop, J. Repke, A. Cohen, A. Caughey, E. Lieberman. Dept OB/Gyn, Harvard Medical School, Massachusetts General Hospital, Brigham and Women's Hospital, Boston, MA.

OBJECTIVE: To determine whether gravidas with a prior low vertical uterine incision (Kronig) are at a higher risk for uterine rupture during a trial of labor after cesarean than women with a prior low transverse uterine incision (Kerr).

STUDY DESIGN: The medical records of all available women undergoing a trial of labor after cesarean over a 12 year period (7/84-6/96) at a tertiary care hospital were reviewed. Women with undocumented prior uterine incisions, both Kerr and Kronig prior uterine incisions, and those whose low vertical incision was thought at the time of surgery to extend into the upper portion of the uterus were excluded. Maternal and perinatal outcomes for women with prior Kerr and Kronig incisions were compared overall and also for the subgroup of women with only one prior cesarean and no prior vaginal deliveries. All scar disruptions including both detected asymptomatic dehiscences and symptomatic ruptures were analyzed.

RESULTS: The outcomes of 3282 trials of labor for the Kerr group and 426 trials of labor for the Kronig group were compared. Regarding all scar disruptions, there were 41 (1.25%) in the Kerr group and 7 (1.65%) in the Kronig group, p = 0.495. There were 31 (0.95%) symptomatic ruptures in the Kerr group and 3 (0.71%) in the Kronig group, p = 0.627. For the subgroup of women with only one prior cesarean, the risk for symptomatic rupture was 26/2997 (0.88%) and 3/266 (1.15%) for the Kerr and Kronig groups, respectively, p = 0.949. Given a 1% rupture rate in the Kerr group, the study had 80% power to detect a uterine rupture rate of 3% in the Kronig group.

CONCLUSIONS: Gravidas with a prior Kronig uterine incision are not at increased risk for uterine rupture during a trial of labor as compared to women with a prior Kerr uterus incision. Women with a prior Kronig uterine incision should be offered a trial of labor for a subsequent delivery.

380 THE INCIDENCE OF UTERINE RUPTURE IN PATIENTS WITH MULLERIAN ANOMALIES ATTEMPTING VAGINAL BIRTH AFTER CESAREAN SECTION. D. Ravanas, P. Brain, J. Pollard. Department of Obstetrics and Gynaecology, University of Calgary, Calgary, AB

OBJECTIVE: The purpose of this study was to determine the incidence of uterine rupture and other complications requiring operative delivery in a cohort of patients with Mullerian anomalies attempting vaginal birth after cesarean section (VBAC)

STUDY DESIGN: All deliveries at the University of Calgary - Foothills Hospital between 1992 and 1997 were evaluated. Of 138 patients with known Mullerian anomalies, 47 had a previous cesarean section (CS). 10 of these had an absolute contraindication to a trial of labor (TOL). Of the remaining 37, 12 had an elective CS and 25 had a TOL. The charts of these 25 patients were reviewed to determine the outcome of the TOL, including route of delivery, uterine rupture, Apgars and cord gases, as well as type of uterine anomaly.

RESULTS: The rate of uterine rupture in this cohort was 8% (2/25). The CS rate was 20% (5/25). All CS were performed urgently for fetal heart rate abnormalities, including 2 cord prolapses. None were performed for failure to progress. 50% (10/20) of those who delivered vaginally required forceps or vacuum; 7 of these were for fetal heart rate abnormalities. Overall, 16% (4/25) had an umbilical artery pH <7.20.

CONCLUSIONS: Vaginal delivery is common in patients with Mullerian anomalies attempting VBAC, but the complications are high. Ineffective repeat cesarean section should be considered in these patients.

381 A TIMELY CESAREAN DECISION-INCISION TIME DOES NOT PREVENT FETAL BRAIN INJURY. JP Phelan, MO Ahn, I Jaureguig, SL Phelan, C Kim. Pomona Valley Hospital Medical Center, Depts. of Ob/Gyn, Cha Women's Hospital, Seoul, Korea, and Childbirth Injury Prevention Foundation.

OBJECTIVE: To determine whether a relationship exists between a cesarean (c/s) decision-incision (DI) time ≤ 30 minutes and fetal brain injury.

STUDY DESIGN: Singleton term infants with neonatal encephalopathy and permanent neurologic impairment were identified in a national registry of brain injured infants. Cases were excluded if the DI time could not be ascertained from the medical records or the patient delivered vaginally. Then, the cases were divided as follows: Group I - bradycardia fetal heart rate (FHR) < 100 bpm on admission to the hospital; Group II - normal FHR followed by a sudden, prolonged FHR deceleration immediately preceding delivery; Group III - reactive FHR pattern on admission followed by tachycardia or repetitive accelerations; Group IV - nonreactive FHR pattern from admission until delivery.

RESULTS: Of the 300 patients, 162 (54 %) met the entry criteria. Of these, 98 (60 %) patients had an incision within 30 minutes of the decision to perform the cesarean. The mean C/S DI time in minutes for the groups were: Group I (N=7), 19 ± 13, range 5 to 40; Group II (N=40), 24 ± 30, range 1-185; Group III (N=32), 32 ± 27, range 1-105; Group IV (N=83) 49 ± 50, range 0-260. The number of patients with a DI time ≤ 30 minutes for each group; Group I - 7 (100 %); Group II - 31 (78 %); Group III - 21 (66 %); Group IV - 39 (47 %). Group I and/or II were significantly different from Groups III and IV (p<0.01).

CONCLUSION: The decision-incision times reflected the urgency of the clinical situation and the probability of fetal neurologic injury. Despite the significantly more rapid C/S response in patients with acute asphyxia (Groups I and II), fetal brain injury was not prevented. Thus, a timely cesarean decision-incision time may not be sufficient to prevent fetal brain injury in circumstances of acute "fetal distress".

382 CHARACTERISTICS OF WOMEN UNDERGOING UTERINE RUPTURE WITH AND WITHOUT A SCARRED UTERUS JP Phelan, MO Ahn, CK Cho, CL Kirkendall, I Jaureguig, C Kim. Pomona Valley Hospital Medical Center, Depts. of Ob/Gyn, Cha Women's Hospital, Seoul, Korea, and Childbirth Injury Prevention Foundation.

OBJECTIVE: To determine whether there is a unique maternal profile for patients with and without a history of prior cesarean (C/S) who had uterine rupture resulting in fetal brain injury.

METHOD: Maternal demographic features in 74 patients with and without prior C/S and subsequent uterine rupture with resultant fetal brain injury were retrospectively analyzed by chart review. Cases were divided as follows: Group I – one or more prior C/S, Group II – no prior history of a C/S.

RESULTS: Demographic Features

<table>
<thead>
<tr>
<th>Maternal Demographic Features</th>
<th>Group I (n=66)</th>
<th>Group II (N=8)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal Age (years)</td>
<td>30.5 ± 6.5</td>
<td>31.1 ± 3.9</td>
<td>0.30</td>
</tr>
<tr>
<td>Graftivity</td>
<td>3.3 ± 1.4</td>
<td>4.1 ± 1.6</td>
<td>0.05</td>
</tr>
<tr>
<td>Parity</td>
<td>1.7 ± 1.4</td>
<td>2.1 ± 1.2</td>
<td>0.05</td>
</tr>
<tr>
<td>EGA (weeks)</td>
<td>39.6 ± 3.1</td>
<td>39.3 ± 2.1</td>
<td>0.03</td>
</tr>
<tr>
<td>Oxytocin Use</td>
<td>47 (71%)</td>
<td>6 (73%)</td>
<td>0.25</td>
</tr>
<tr>
<td>Cervical Ripening</td>
<td>21 (31%)</td>
<td>1 (13%)</td>
<td>0.05</td>
</tr>
<tr>
<td>Prior Vaginal Birth</td>
<td>13 (20%)</td>
<td>6 (75%)</td>
<td>0.06</td>
</tr>
<tr>
<td>Epidural Placement</td>
<td>28 (42%)</td>
<td>4 (50%)</td>
<td>0.30</td>
</tr>
</tbody>
</table>

Prior C/S Indication

| CPD/FTP                     | 27 (41%)     | 0.36 |
| Breech                      | 16 (24%)     | 0.15 |
| Fetal Distress              | 9 (14%)      | 0.30 |
| Other                       | 14 (21%)     | 0.30 |

CONCLUSION: With the exception of a significantly greater number of women with a prior vaginal birth in patients without a prior cesarean maternal demographic characteristics were statistically similar. The finding suggest that there is no unique maternal profile other than a prior cesarean associated with uterine rupture and resultant fetal brain injury.
384 UTERINE RUPTURE DURING A TRIAL OF LABOR (VBAC) H. Weinberg, C. Brumfield, S. Oliver, J. Hauth, M. Dufard, Dept. of OB/GYN, University of Alabama at Birmingham.

OBJECTIVE: To determine risk factors for uterine rupture or scar dehiscence in women undergoing a trial of labor (TOL) after one prior low transverse cesarean (LTCS).

STUDY DESIGN: Cases of uterine rupture (N=6) or scar dehiscence (N=12) occurring from 1987-1997 were identified from 2000 trials of labor (1987-97) after prior CS. Cases included only women with one prior LTCS undergoing a trial of labor. Controls were independently matched (1:1) to index cases. Controls A included women with a prior LTCS and vaginal delivery (N=56). Controls B included women with a prior LTCS whose TOL ended in repeat CS at a cervical dilatation of >5 cm (N=94). At repeat CS, the uterine scar was intact. Odds ratios for rupture/dehiscence with 95% confidence intervals (CI) were calculated for selected risk factors during the prior LTCS, and for labor variables during the TOL.

RESULTS: The table lists unadjusted odds ratios and 95% CI for rupture/dehiscence selected risk factors by control group.

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>With Prior LTCS</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>W/D Control</td>
<td>C/S Control</td>
<td></td>
</tr>
<tr>
<td>Dystocia</td>
<td>0.5, 4.7</td>
<td>3.9 1.119</td>
</tr>
<tr>
<td>Bandage scissors used</td>
<td>0.4 0.1, 1.4</td>
<td>0.6 0.2, 2.5</td>
</tr>
<tr>
<td>1 vs 2 layer uterine closure</td>
<td>4.7 1.5, 15</td>
<td>2.8 0.9, 8.9</td>
</tr>
<tr>
<td>Endometritis</td>
<td>5.6 1.1, 11.6</td>
<td>3.9 1.2, 12.8</td>
</tr>
<tr>
<td>Wound complication</td>
<td>12.5 1.2, 129.3</td>
<td>3.9 0.7, 21.7</td>
</tr>
<tr>
<td>During Trial of Labor</td>
<td>Amnionitis</td>
<td>3.5 0.6, 1.93</td>
</tr>
<tr>
<td>0.2, 3.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labor &gt; 15 hours</td>
<td>0.6 0.2, 2.1</td>
<td>0.6 0.2, 2.3</td>
</tr>
<tr>
<td>Oxygen usage (N=80)</td>
<td>With cervix &lt;2 cm</td>
<td>9.8 1.9, 51.2</td>
</tr>
<tr>
<td>Induction vs. Augmentation</td>
<td>5.7 1.3, 25.0</td>
<td>3.7 0.9, 15.5</td>
</tr>
<tr>
<td>Maximum oxytocin 20 mU 12</td>
<td>0.3, 4.5</td>
<td>3.0 0.7, 12.4</td>
</tr>
</tbody>
</table>

The 6 women with uterine rupture drank all received oxygen at ≤2 cm, and 4 of the 6 had endometritis following their prior CS.

CONCLUSIONS: Risk factors for uterine rupture or scar dehiscence during trial of labor include endometritis following the prior LTCS, and oxygen usage with cervical dilatation of 2 cm or less.

385 CESAREAN DELIVERY RATE REDUCTION. C. Fernandez, J. Canterino, S. Danbeck, J. Mckeevers, UMDNJ-Robert Wood Johnson Medical School/St. Peter’s Medical Center, New Brunswick, NJ and Jersey Shore Medical Center, Meridian Health System, Neptune, NJ.

OBJECTIVE: To evaluate the effectiveness of a program of labor management techniques on the cesarean delivery (C/S) rates at a community hospital.

STUDY DESIGN: A program for labor management designed to reduce C/S rates was initiated from September 1997 for a 10 month period ending in June 1998. All practicing physician groups were requested to voluntarily agree to incorporate several measures to lower their C/S rates. These measures included: avoid latent phase admission (cervical dilatation ≤5 cm), delay epidural placement until cervical dilatation ≥4 cm, encourage vaginal birth after C/S (VBAC), use of labor ball, labor down and doula support, and use of low risk order sets for admission to labor and delivery. Patient outcomes of participating physician groups were compared to those in the non-participating physician groups. The incidence of cesarean delivery was determined and compared between groups. Statistical analysis was by way of odds ratio (OR) and confidence interval (CI). The C/S rates were compared between participating and non-participating physician groups.

RESULTS: Data for 10 months were analyzed. Overall the C/S rate for non-participants was 30% and for participants was 21% (OR 1.98, 95% CI 1.23-2.70). When looking at latent phase admissions, the C/S rate for patients admitted at ≤3 cm was 30.5% while those admitted at ≥3 cm was 8% (OR 5.97, 95% CI 2.46-10.45). C/S rates for patients with epidurals placed at ≤4 cm was 40%, while epidurals placed at ≥4 cm was 15% (OR 4.0, 95% CI 1.51-10.54). When low risk order sets were utilized the C/S rate was 4% compared to 26% when they were not (OR 7.56, 95% CI 1.57-36.5). There were no intensive care unit admissions or infants with less than 7 in the participating groups.

CONCLUSIONS: A program of safe labor management techniques described above can reduce the C/S rates in a community hospital.
387 UMBILICAL CORD VESSELS: A COMPARISON OF COLOR DOPPLER VERSUS GREY SCALE ULTRASONOGRAPHY. D. P. Warren,* D.D. Johnson. Department of OB/GYN, Medical University of SC, Charleston, SC. OBJECTIVE: To determine if color doppler (CD) improves visualization of umbilical cord vessels (UCV) in the second trimester.

METHODS: Patients delivered at the Medical University of South Carolina between 8/97 and 2/98 with an ultrasound examination between 15 and 24 weeks gestation were included in this prospective observational study. The sonographic examination of the UCV was performed with either grey scale (GS) (n=145) or CD (n=139). The sonographic images were reviewed independently by two investigators, blinded to the clinical outcome, to determine if the UCV were visualized. The obstetric chart was used to confirm the number of UCV at birth. Categorical and nominal data were analyzed by Chi-square and an unpaired t-test, respectively.

RESULTS: The UCV were visualized in 110/139 (79%) cases by CD versus 88/145 (60%) by GS (p=0.001). At both clinics, the average number of images documented per patient was not statistically different (1.5±0.51 [SD] with CD and 1.4±0.58 with GS). The GS were visualized equally well in the cross-sectional (12/21 CD versus 31/58 GS p=0.96) and longitudinal views (7/27 CD versus 48/103 GS p=0.08). However, the pelvic vessels were more easily seen with CD than with GS (105/131 CD versus 24/45 GS p=0.001). The mean gestational age of fetuses scanned with GS was 19.5±1.9 weeks compared to 20.3 weeks ±2.1 with GS (p=0.001).

CONCLUSIONS: CD improves visualization of the UCV at an earlier gestational age than GS ultrasonography alone.

390 MAGNIFICATION SULFATE INCREASES IMPEDANCE TO FLOW IN THE FETAL SYSTEMIC CIRCULATION BUT HAS NO EFFECT ON THE CEREBRAL CIRCULATION. J. Martinez-Poyer, M. Hailak, M. King, M. Kruger*, Y. Sorokin. Division of Maternal-Fetal Medicine. Dept of OB/Gyn, Wayne State University, Detroit, Michigan.

OBJECTIVE: To assess the effect of intravenous magnesium sulfate (MgSO4) on maternal and fetal blood flow waveforms (FFW) in normal pregnancy.

STUDY DESIGN: 32 normal patients with singleton pregnancies > 30 weeks' gestation were recruited. Patients were randomized to receive loading doses and maintenance infusions of either normal saline or MgSO4 (6 gm followed by 5gm/hr) for three hours in unlabeled IV bags. Maternal blood was drawn before the infusions for measurement of MgSO4 levels. All Doppler evaluations were performed by the same operator using a color Doppler system (Acuson 128 XP), prior to the infusions and then at 1 hour and 3 hour intervals following the medication, for a duration of 30 minutes. Fetal heart rate (FHR) and umbilical artery (UA), uterine artery (UA), aorta (AO), renal artery (RA), middle cerebral artery (MCA), hepatic vein, ductus venous, and inferior vena cava. Standard Doppler indices for arteries and veins were examined. Velocity measurements were taken after correction for the angle of insonation. Differences between the study periods were expressed as percent change from baseline values. Statistical analysis included 2-way ANOVA, t-test, and 1-way repeat measures ANOVA.

RESULTS: 16 patients were randomized to saline and 16 to MgSO4. No differences attributable to demographic parameters were observed between the two groups. Ionized and total magnesium levels significantly increased in the MgSO4 group at 1 and 3 hours. UA diastolic velocity (Vmm) increased at 1 hour (p<0.05) and no change at 3 hours. UA and MCA pulsatility index (PI) and RA resistance index (RI) were significantly increased at 3 hours in the MgSO4 group. AO pulsatility index (PI) and RA resistance index (RI) were significantly increased at 3 hours in the MgSO4 group (p<0.05). There were no statistically significant changes in the MCA RI or any other maternal or fetal arterio-venous Doppler parameters.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Mean ± SD</th>
<th>1 hour</th>
<th>3 hours</th>
<th>6 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saline (n=16)</td>
<td>% of baseline</td>
<td>% of baseline</td>
<td>% of baseline</td>
<td>% of baseline</td>
</tr>
<tr>
<td>UA Vmin</td>
<td>113.1±30.5</td>
<td>111.5±33.7</td>
<td>90.9±27.7</td>
<td>87.3±31.3</td>
</tr>
<tr>
<td>AO PI</td>
<td>106.8±17.0</td>
<td>94.5±17.7</td>
<td>107.3±15.8</td>
<td>110.1±13.9</td>
</tr>
<tr>
<td>RA RI</td>
<td>100.0±6.1</td>
<td>87.9±9.6</td>
<td>105.8±8.5</td>
<td>102.6±3.9</td>
</tr>
<tr>
<td>MCA RI (NS)</td>
<td>102.7±12.0</td>
<td>96.6±13.5</td>
<td>102.9±6.8</td>
<td>101.3±6.5</td>
</tr>
</tbody>
</table>

CONCLUSIONS: The observed changes in the UA, AO, and RA may not represent a MgSO4 mediated fetal cardio-depressant effect. Intravenous administration of MgSO4 does not appear to affect the cerebral circulation in fetuses of normal patients.

389 THE USE OF NITROVASODILATORS BEFORE AND DURING PREGNANCY: HEMODYNAMIC AND DOPPLER FLOW STUDIES. J. Jakovitcz*, A. Amit*, J. Pas*, D. Kamili*, I. Thaler*. Dept. of OB/GYN, Rambam Medical Center, Haifa, Israel

OBJECTIVE: To study the effect of isosorbide dinitrate (ISD), a nitric-oxide donor, on utero-placental and umbilical-placental blood flow and maternal blood pressure and heart rate before pregnancy, during normal pregnancy and in women who developed pregnancy-induced hypertension (PIH). The purpose was to also study the effects of this treatment on umbilical blood flow and on fetal heart rate (FHR) in women with PIH.

STUDY DESIGN: The study was performed in a double blind placebo-controlled manner. Women in each group were either given a sublingual dose of 5 mg ISD or placebo. Doppler flow measurements, maternal heart rate and blood pressure were obtained before (baseline) and at a time interval following the medication, for a duration of 30 minutes. Fetal heart rate was recorded simultaneously and analyzed by a computer.

RESULTS: The Table summarizes the maximal changes following ISD, expressed as percent deviation from baseline. Asterisks denote statistical significance. There were no significant changes following placebo.

<table>
<thead>
<tr>
<th>No.</th>
<th>MBP</th>
<th>MHR</th>
<th>RI-Umb.</th>
<th>RI-Uter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Follicular</td>
<td>9</td>
<td>-9.7*</td>
<td>15.5*</td>
<td>-</td>
</tr>
<tr>
<td>Luteal</td>
<td>9</td>
<td>-9.4*</td>
<td>12.6</td>
<td>-</td>
</tr>
<tr>
<td>I trimester</td>
<td>11</td>
<td>-11.5*</td>
<td>11.7</td>
<td>-</td>
</tr>
<tr>
<td>II trimester</td>
<td>18</td>
<td>-15.0*</td>
<td>12.0*</td>
<td>-10.5*</td>
</tr>
<tr>
<td>PH</td>
<td>23</td>
<td>-12.6*</td>
<td>25.0*</td>
<td>-16.5*</td>
</tr>
</tbody>
</table>

RI: Resistance Index; Umb: umbilical artery; Uter: uterine artery; MBP: mean blood pressure; MHR: maternal heart rate; Follicular: follicular phase, Luteal: luteal phase, of a normal menstrual cycle.

No significant changes in FHR were observed in patients with PIH. However, the number of small decelerations decreased and the number of fetal movements increased following ISD.

CONCLUSIONS: ISD decrease the resistance index in the uterine and umbilical arteries (where applicable) before and during pregnancy and this effect is more prominent in patients with PIH. The observed hemodynamic alterations are not associated with significant changes in FHR.
91 ASSESSMENT OF FETAL CEREBRAL OXYGENATION DURING PLACENTAL CIRCULATORY INSUFFICIENCY. A. Skoll, J.C. Fououn*, M. Lessard*, J. Maccabi**, E. Jacobs*, B. Gafney, J. Tung, M. De Sweit. Fetal Medicine Unit, Obstetric Hospital, Montreal, Quebec, Canada.

OBJECTIVE: To demonstrate that with the increase in placental vascular resistance (PVR) observed in most growth restricted fetuses, a reversal of flow through the aortic isthmus (AoI) causes a significant fall in O2 delivered to the brain.

STUDY DESIGN: Progressive compression of the umbilical veins of 8 exteriorized fetal lambs was realized at approximately 140 days of gestation. Doppler measurement of combined cardiac output (VencQ) and flows through the AoI(AoQ), carotid (CaQ) and umbilical arteries (UQ) was performed. The study was designed to create 1) basal; 2) moderate; 3) severe and 4) extreme increases in PVR.

RESULTS: The increase in PVR caused a significant fall in UQ and vent.Q while CaQ increased. The actual values (mean ± SD) for AoQ and UQ delivered to the brain were for the 4 levels of PVR:

<table>
<thead>
<tr>
<th>Level</th>
<th>Baseline</th>
<th>Moderate</th>
<th>Severe</th>
<th>Extreme</th>
</tr>
</thead>
<tbody>
<tr>
<td>AoQ</td>
<td>98 ± 15</td>
<td>52.9</td>
<td>3.25*</td>
<td>-29.8*</td>
</tr>
<tr>
<td>UQ (ml/min/kg)</td>
<td>67.8 ± 12.3</td>
<td>4.8 ± 25.3</td>
<td>4.8 ± 25.3</td>
<td></td>
</tr>
<tr>
<td>UQ (ml/min)</td>
<td>2.9 ± 1</td>
<td>1.3 ± 0.8</td>
<td>1.3 ± 0.8</td>
<td></td>
</tr>
</tbody>
</table>

* p<0.05 compared with baseline

CONCLUSION: During an acute increase in placental vascular resistance delivery of O2 to the brain is preserved despite significant drop in maternal P02, as long as net flow through the isthmus is anterograde.

92 UMBILICAL VEIN BLOOD FLOW DOPPLER MEASUREMENTS IN GROWTH RESTRICTED FETUSES. R. Rigure*, A. Barbera*, N. Giovannini, M. Vincio, H. Galan**, and E. Ferrazzix. Dept. Ob/Gyn at ISBM San Paolo Univ, Milan, and * UCHSC at Denver, CO.

OBJECTIVE: To compare umbilical vein (UV) diameter, mean velocity and blood flow between intrauterine growth restricted fetuses (IUGR) of different severity and normal fetuses.

STUDY DESIGN: 37 singleton IUGR fetuses were compared to local standards from 70 normal fetuses. UV diameter and mean velocity were measured on a perpendicularly and longitudinal section of free cord, respectively. Simultaneous real time, color and Doppler ultrasound exams were performed within four hours of the last non stress test just prior to delivery. UV flow (ml/min) was calculated as a function of gestational age, head (HC) and abdominal circumference (AC). IUGR fetuses were divided into three groups: Group I: normal umbilical artery Pulsatility Index (PI) and fetal heart rate (FHR), Group II: abnormal PI and normal FHR, Group III: abnormal PI and FHR. UV flow was normalized for HC and AC compared between normal and abnormal fetuses.

RESULTS: The UV mean velocity normalized for either AC or HC was significantly lower in IUGR compared to normal fetuses, whereas no differences were noted for the UV diameter. The UV flow in IUGR fetuses compared to gestational age, abdominal and head circumference, was significantly lower (p<0.0001) than in normal fetuses. There were 5 IUGR fetuses in Group I, 20 in Group II, and 12 in Group III. The regressions of UV flow/AC versus gestational age were significantly lower in Groups 2 and 3 compared to normal fetuses (p<0.05). The regressions of UV flow/HC versus gestational age were significantly lower in all three IUGR groups compared to normal fetuses (p<0.001). UV flow/HC was significantly less than UV flow/AC in Groups 2 and 3 (p<0.05). When observed values of UV flow/HC in IUGR fetuses were compared to local standards across gestational age, 60%, 85%, and 92% of fetuses in Groups 1, 2, and 3 respectively were below the 10th percentile.

CONCLUSION: UV flow was reduced in IUGR compared to normals which appears to be due to decreased UV velocity. UV flow corrected for AC rather than for HC better distinguishes the severity of IUGR fetuses. These parameters may be useful adjuncts for testing the compromised IUGR fetus. We speculate that linear measurements of fetal growth (HC, AC) may be more accurate for normalizing flow rather than estimated fetal weight which is known to be subject to considerable systematic error.

93 PREDICTIVE VALUE OF UTERINE ARTERY VELOCITY WAVEFORM AND MIDTRIMESTER MATERNAL SERUM AFP/HCG IN HIGH RISK PREGNANCIES. R. Hershcovs*, J.C. Kingdom, J. Tung, M. De Sweit. Fetal Medicine Unit, Obstetric Hospital, University of London, UK.

OBJECTIVE: To determine the value of uterine artery waveform and mid trimester maternal serum AFP/HCG measurements in predicting pregnancy complications in a high risk group of pregnant patients.

METHODS: 68 patients with chronic hypertension and/or diabetes mellitus, with or without previous pregnancy complications, were followed. AFP and HCG were assayed in the first trimester and also at 16-20 weeks' gestation.

RESULTS: AFP and HCG were increased in two patients with chronic hypertension and one with diabetes mellitus compared to normal values. AFP and HCG were increased in two patients with chronic hypertension and one with diabetes mellitus compared to normal values. AFP and HCG were increased in two patients with chronic hypertension and one with diabetes mellitus compared to normal values. AFP and HCG were increased in two patients with chronic hypertension and one with diabetes mellitus compared to normal values. AFP and HCG were increased in two patients with chronic hypertension and one with diabetes mellitus compared to normal values.
VOLUMETRIC BLOOD FLOW: NORMAL CORDS VERSUS A SINGLE UMBILICAL ARTERY CORD

OBJECTIVE: To test the hypothesis that normal fetuses with two or a single umbilical artery (SUA) should have the same volumetric flow through the umbilical cord.

STUDY DESIGN: Volumetric flow was assessed in normal singleton pregnancies from 18-40 weeks gestation by ultrasonography using color Doppler flow to determine peak velocity of flow at an angle of insonation of 30-60° and measuring the diameter of an umbilical artery. There were 259 patients with a normal cord and 24 with an SUA. Doppler velocimetry indices (S/D, pulsatility, resistance), fetal biometry, estimated fetal weight, and amniotic fluid index were simultaneously obtained. Patients were clustered into cells: < 20 weeks, 22-27 9 weeks, 28-31 9 weeks, 32-35 9 weeks, and > 36 weeks. Data was graphically displayed with mean and 95% confidence levels.

RESULTS: Volumetric blood flow (cc/min) from 24 weeks to term, was two times greater in the SUA than in one artery of a normal cord (p < 0.05). The umbilical artery diameter and the peak velocity were greater in the patients with an SUA. The resistance indices were all lower in SUA as compared to normal (p < 0.05) except at term. Fetal biometry did not reveal significant differences between the groups.

CONCLUSION: Volumetric blood flow (cc/min) can be determined noninvasively using ultrasound, and the flow through an SUA is twice that of an artery in a normal cord. This confirms the concept that at each gestational age fetal blood flow is the same for babies with an SUA as compared to those with a three vessel cord.

DIFFERENCES BETWEEN PROXIMAL AND DISTAL UTERINE ARTERY DOPPLER INDICES IN HYPERTENSIVE AND NORMAL PATIENTS BETWEEN 18-36 WEEKS GESTATION

OBJECTIVE: To identify a trend in serial uterine Doppler indices in both the proximal and distal uterine arteries in pregnant women who have or would ultimately develop HTN during their pregnancy.

STUDY DESIGN: 513 diverse women were studied prospectively from 18 weeks to delivery at 5 time periods during their pregnancy, T1 (18-20), T2 (20-23), T3 (23-27), T4 (27-31), and T5 (31-35) weeks. Flow velocity waveforms for the right and left proximal and distal uterine arteries were obtained and the S/D ratio, RI, and PI were calculated. After delivery, patients with chronic HTN, transient HTN, or preeclampsia were compared to remaining normotensive pregnant women. Differences for the indices were calculated by repeated measures ANOVA.

RESULTS: The HTN population had significantly higher S/D ratio, RI, and PI at 18-20 and 28-30 weeks than controls, p<0.05. At 18-20 weeks only the right and left distal uterine arteries (closer to placenta) had higher ratios. In contrast by 28-30 weeks both proximal uterine arteries had higher ratios than controls.

CONCLUSION: The Doppler data showed significantly higher S/D ratio, RI, and PI values for patients with HTN diseases at 18-20 and 28-30 weeks. At 18-20 weeks only the distal uterine arteries showed higher values which became normal by 28-30 weeks. Changes in the distal uterine arteries (near the placenta) may reflect an adaptation in patients with HTN diseases of preeclampsia such as the release of placental corticotropin releasing hormone (CRH), a vasodilator known to be elevated in patients with HTN during pregnancy. In contrast the right and left proximal uterine arteries had higher values only at 28-30 weeks. This may reflect the incomplete trophoblastic invasion at 24-26 weeks and the appearance of increased vascular resistance in the maternal circulation remote from the placenta as demonstrated in the right and left proximal uterine artery.

PREDICTION OF FETAL ANEMIA BY MEASUREMENT OF MIDdle CEREBRAL ARTERY PEAK VELOCITY

OBJECTIVE: Our purpose was to assess the accuracy of middle cerebral artery peak velocity (MCAPV) as a predictor of fetal hemoglobin concentration (Hgb) in red cell alloimmunized pregnancies before and after intrauterine transfusions.

STUDY DESIGN: This study was a retrospective analysis of data collected over a four-year period from pregnancies complicated by Rhesus (Rh) or Kell sensitization. All patients underwent cordocentesis and/or intrauterine transfusions (IUT). MCAPV’s were determined prior to the procedures in all patients. For purposes of analysis, the data was divided into 2 groups based on whether or not an IUIVT had ever been performed prior to the Doppler studies. The data in Group 1 were collected from fetuses prior to cordocentesis or any IUIVT’s. Group 2 consisted of data collected 1-6 weeks after one IUIVT. Established reference ranges corrected for gestational age were used for MCA and fetal Hgb. Fetal anemia was defined as a Hgb<2.5SDs below the mean. An elevation of the MCAPV was defined as 2SDs above the mean. Statistical significance between groups was determined by Pearson’s Correlation and the Z test. Sensitivity and specificity were calculated.

RESULTS: 27 affected pregnant women underwent 42 cordocentesis and/or IUIVT over a four-year period. 27 procedures were performed for Rh disease and 15 for Kell sensitization. Group 1 consisted of data from 33 procedures and Group 2 consisted of data from 9. The mean Hgb’s were 10.0 GM% and 10.2 GM% for Groups 1 and 2, respectively. Pearson’s Correlation between the MCAPV and Hgb corrected for gestational age were R2=0.586 (p=0.001) for Group 1 and R2=0.675 (p<0.01) for Group 2. Correlations were not significantly different between the two groups.

CONCLUSION: Measurement of the MCAPV appears to be a more useful tool to predict anemia in fetuses who have undergone an intrauterine transfusion as compared to patients who have not been previously transfused. Ongoing studies continue at our institution to confirm these preliminary findings.

CLINICAL SIGNIFICANCE OF EARLy DIASTOLIC NOTCH OF UTERINE ARTERY DOPPLER VELOCIMETRY IN RELATION TO PLACENTAL LOCATION

OBJECTIVE: Our purpose was to investigate the relation between type of early diastolic notch and placental location and to evaluate the difference in perinatal outcome.

STUDY DESIGN: We evaluated Doppler waveform of uterine artery in 104 pregnant women having an early diastolic notch after 26 weeks of gestation. Placental location was determined by real time ultrasonography and classified as central and lateral placenta. The unilateral diastolic notches were divided into 3 groups depending on the placental location (ipsilateral: same side of the placenta, contralateral: opposite side of the placenta, median: central placenta).

RESULTS: Patients with bilateral notches (n=46) were associated with the worse perinatal outcome than unilateral notch (n=58, p=0.005). Among the unilateral groups (ipsilateral: n=8, median: n=11, contralateral: n=9), there were no difference in perinatal outcomes. In bilateral notches group, S/D ratio of contralateral uterine artery was higher than ipsilateral one (n=39, mean±1.5 SD Ve 2.58, p=0.006).

CONCLUSION: Bilateral notches were associated with the worse pregnancy outcome than unilateral notch. The pregnancy outcomes tend to be similar in unilateral notch irrespective of placental location.

<table>
<thead>
<tr>
<th>Sensitivity</th>
<th>Specificity</th>
<th>PPV</th>
<th>NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1 (n=33)</td>
<td>53</td>
<td>89</td>
<td>80</td>
</tr>
<tr>
<td>Group 2 (n=9)</td>
<td>83</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>
400 UMBILICAL AND UTERINE ARTERY VELOCIMETRY AND OUTCOME OF PREGNANCIES COMPROMISED BY INSULIN-DEPENDENT DIABETES MELLITUS. R. Jaffe, J. C. Glantz, P. Eggers, D. Smiths, Dept. OB/GYN, University of Rochester School of Medicine and Dentistry, Rochester, NY.

OBJECTIVE: To assess the relationship between longitudinal umbilical and uterine artery flow velocity waveforms (FVW) analysis and maternal and fetal complications in pre-gestational and gestational type I and II diabetes mellitus.

STUDY DESIGN: Twenty-six pregnancies complicated by insulin-dependent diabetes mellitus were followed longitudinally from first trimester to delivery. Umbilical artery (UA) and uterine artery (UtA) Doppler waveforms (mean velocity, pulsatility index, peak systolic and end-diastolic velocity) were recorded at 5-8 week intervals. Changes in FVW in pre-existing and newly identified abnormal findings were correlated with adverse perinatal outcomes.

RESULTS: Aggregate UtA RI and UmbA S/D slopes were negative when plotted against gestational age, as expected (p < 0.0001). Low 1-minute Apgar score and increased risk of any perinatal complication correlated with less-negative UtA slope (p = 0.006), while macromelia correlated with less-negative UmbA slope (p = 0.05). Glycemic control and diabetes class did not correlate with UtA RI or UmbA S/D slopes. Last UtA RI and UmbA S/D measurement correlated with, HgbA1c (intraclass range p = 0.17), and last UtA RI values were higher with increasing frequency of postnatal hypoglycemia (p = 0.025). Birth weight and diabetes class strongly correlated with glycemic control (p = 0.008).

CONCLUSIONS: Abnormal uterine and umbilical artery FVW slopes do not correlate with diabetes class or glycemic control, but do correlate with increased risk of adverse outcome.

401 PERINATAL OUTCOME IN TWIN PREGNANCIES COMPROMISED BY SEVERELY ABNORMAL UMBILICAL ARTERY DOPLPER VELOCIMETRY. L. M. Thompson, L. J. Heffner, D. K. Richardson, P. M. Doubilet, B. B. Feinberg. E. R. Norwitz. Dept. of Ob/Gyn, Brigham & Women’s Hospital, Boston, MA.

OBJECTIVE: To determine whether severely abnormal umbilical artery Doppler velocimetry is associated with poor perinatal outcome in structurally normal twins.

STUDY DESIGN: All twin pregnancies ≥24 weeks’ gestation delivered at the Brigham & Women’s Hospital from January 1, 1986 to July 1996 who had previous umbilical artery Doppler velocimetry were identified using an ultrasound database (n = 143). In 82 twin pairs, Doppler velocimetry was performed on both fetuses. Indications included hypertensive disorders of pregnancy, growth discordance, or unexplained oligohydramnios. Exclusion criteria included the absence of neonatal follow-up (n = 2) and structural anomalies (n = 3). Severely abnormal Doppler velocimetry (defined as absent or reversed flow) was present in 25 fetuses from 17 pregnancies. Only twin pregnancies which were discordant for severely abnormal Doppler velocimetry were included in the analysis (n = 17) thereby establishing a gestational-age matched control group. Primary outcome measures included intrapartum fetal demise, neonatal death, intraventricular hemorrhage, and necrotizing enterocolitis. Secondary outcome included oligo-hydramnios and intrapartum growth restriction (IGR). Statistical difference was determined using the X2 statistic.

RESULTS: Mean gestational age at delivery was 36.6 weeks (range, 25.4-36.4). Perinatal outcome for the 17 twin pregnancies (34 fetuses) discordant for severely abnormal Doppler velocimetry were as follows:

<table>
<thead>
<tr>
<th>Abnormal Doppler</th>
<th>Normal Doppler</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary outcomes:</td>
<td></td>
</tr>
<tr>
<td>7/17 (41%)</td>
<td>3/17 (18%)</td>
</tr>
<tr>
<td>Secondary outcomes:</td>
<td></td>
</tr>
<tr>
<td>IUGR</td>
<td>13/17 (76%)</td>
</tr>
<tr>
<td>oligohydramnios</td>
<td>9/17 (53%)</td>
</tr>
</tbody>
</table>

Adverse events were evenly distributed between the 7 monochorionic/diamniotic and 10 dichorionic/diamniotic pregnancies. The majority of fetuses with severely abnormal Doppler velocimetry had abnormal cord insertions (12/17 vs 5/17 with normal Dopplers; p = 0.016) and were non-presenting twins (15/17; p < 0.0001).

CONCLUSIONS: Severely abnormal Doppler velocimetry is highly predictive of IUGR and oligohydramnios. Although there is a trend towards worse outcomes in such fetuses compared with their gestational-age matched partners, this did not reach statistical significance possibly because of type 2 statistical error.


OBJECTIVE: To determine if twin birth order affects mortality and morbidity compared with singletons of the same gestational age.

STUDY DESIGN: Retrospective cohort analysis of consecutive livebirths within multiformations and gestational age 26 to 34 weeks, delivered between January 1, 1988 and December 31, 1997. Only liveborn twin pairs were included. Statistical analysis was performed using chi-square.

RESULTS: 456 sets of twins were compared with 5602 singletons. Second-born twins had excess respiratory morbidity compared with first-born twins and singletons, independent of mode of delivery. No differences in IVH, NEC, neonatal sepsis, or cord pH < 7.1 were noted between the groups.

<table>
<thead>
<tr>
<th>Weeks gestation</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td>27-29</td>
</tr>
<tr>
<td>RDS: Singl.</td>
<td>105 (65%)</td>
</tr>
<tr>
<td>Twin A</td>
<td>8 (67%)</td>
</tr>
<tr>
<td>Twin B</td>
<td>11 (92%)</td>
</tr>
<tr>
<td>BPD: Singl.</td>
<td>50 (35%)</td>
</tr>
<tr>
<td>Twin A</td>
<td>2 (17%)</td>
</tr>
<tr>
<td>Twin B</td>
<td>3 (25%)</td>
</tr>
<tr>
<td>Neonatal death.</td>
<td>Singl.</td>
</tr>
<tr>
<td>Twin A</td>
<td>5 (42%)</td>
</tr>
<tr>
<td>Twin B</td>
<td>5 (42%)</td>
</tr>
</tbody>
</table>

* Significant, p < 0.004.

CONCLUSIONS: The excess respiratory morbidity in preterm twins, compared with singletons, is associated with second-born twins. First-born twins have outcomes similar to singletons of the same gestational age. This suggests that birth order is an important determinant of respiratory morbidity in twin gestations.
404 DISTRIBUTION OF THE UMBILICAL VENOUS FLOW THROUGH THE DUCTUS VENOSUS IN IUGR FETUSES M Bellotti, B Borzo, G Pennati, E Ferrazzi, FPG Leone, C De Gasperi, G Pardi. Dept Obst/GYN ISBM San Paolo, Univ. Milan, Italy, *Dept of Biomechanics, Politecnico of Milan, Italy

OBJECTIVE: To verify if the umbilical venous blood flow through the Ductus Venosus is increased in growth restricted fetuses (IUGR) with abnormal uterine and umbilical artery waveforms, compared to normal (AGA) fetuses.

STUDY DESIGN: 39 IUGR fetuses with abnormal uterine and umbilical Doppler velocimetry were examined between 21 and 36 weeks of gestation. (mean number of exams per fetus = 2.1±1.6). Diameter (D) and time averaged peak velocity (Vmax) of Doppler tracings of the intrapartum umbilical vein (UVa), immediately before the branching of the Ductus Venosus, and of the Ductus Venosus (DV) at the isthmus were measured.

RESULTS: Five of 6 pump twins survived the neonatal period. Two of the three twins with good outcomes each had IAR > 0.20, whereas three with poor outcomes had smaller IAR < 0.05.

<table>
<thead>
<tr>
<th>Pump Twin RI</th>
<th>Cardiac Twin RI</th>
<th>IAR</th>
<th>Delivery (Weeks)</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 0.64</td>
<td>0.68</td>
<td>0.04</td>
<td>28</td>
<td>Heart failure, neonatal death</td>
</tr>
<tr>
<td>2 0.86</td>
<td>0.89</td>
<td>0.03</td>
<td>34</td>
<td>Heart failure, PVL, pulm. hemorrhage</td>
</tr>
<tr>
<td>3 0.95</td>
<td>0.91</td>
<td>0.04</td>
<td>39</td>
<td>Cerebellar steal with aplasia</td>
</tr>
<tr>
<td>4 0.66</td>
<td>1.0</td>
<td>0.33</td>
<td>31</td>
<td>Limb abnormality, no CNS/heart prob.</td>
</tr>
<tr>
<td>5 0.60</td>
<td>*</td>
<td>*</td>
<td>56</td>
<td>No complications</td>
</tr>
<tr>
<td>6 0.50</td>
<td>0.73</td>
<td>0.23</td>
<td>39</td>
<td>No complications</td>
</tr>
</tbody>
</table>

* Doppler flow too low to calculate waveform

CONCLUSIONS: We found larger differences in RI (>0.20) to be associated with improved outcome of the pump twin in pregnancies complicated by TRAPS. Smaller RI differences (<0.05) were associated with poor outcome, including cardiac failure and CNS hyperperfusion.

405 DECOMPENSATION OF BRAIN SPARING EFFECT IN FETUSES WITH INTRAUTERINE GROWTH RESTRICTION. D Borowski, K. Szaflik, J Wilczynski, P Hnizdovsky. Research Institute Polish Mother's Memorial Hospital, Department of Ultrasonography in Obstetrics and Gynecology Lodz, Poland

OBJECTIVE: In pregnancies with IUGR (intrauterine growth restriction) we observed a reduction in umbilical perfusion and an increase in the flow toward the brain. That situation called the brain "sparing effect" is supposed to compensate fetal hypoxia. The increase in the flow toward brain is interpreted as a vasomotor response to hypoxia. Authors noted that when severe ascorbic appear the brain sparing effect had been lost on two days before IUD (intrauterine death). We called that severe pathologic situation the "decompensation of brain sparing effect" or decompensation of circulatory centralization. The aim of our study was the presentation of eight fetuses with decompensation of brain sparing effect.

STUDY DESIGN: We included 8 fetuses with severe IUGR and decompensation of brain sparing effect from 62 cases with IUGR and circulatory centralization. Sonographic examinations were performed on ACUSON 128 XP/10 with sector transducers (2,5 MHz - 5 MHz).

We calculated cerebroplacental ratio (CPR). Redistribution was diagnosed when CPR was less than 1. Decompensation of brain sparing effect was diagnosed when CPR increased and entered the "normal" range again.

RESULTS: Decompensation of brain sparing effect was observed in 8 cases (8,7%) IUGR was diagnosed between 28 and 33 weeks of gestation (calculated form Naegele's rule) and 22 - 28 weeks of gestation (sonographic assessment). In 7 cases we observed oligohydramnios (4,5 - 7 cm). In 6 cases we observed hypertensive pregnancies. The value of CPR in longitudinal study was estimated between 0,41 - 0,63. We observed 2 IUD and 4 deaths after delivery in our study group. The time interval between the last Doppler study and the diagnosis of IUD was 56 hours.

CONCLUSIONS: Decompensation of brain sparing effect was diagnosed when CPR increased and entered normal range (>1) again. We suggest that pregnancy with decompensation of brain sparing effect should be ended in 48 hours after diagnosis of reversal adaptation.

406 ANTIBODY INDUCED ANEMIA IN FETAL SHEEP: A MODEL FOR ISOIMMUNE HEMOLYTIC ANEMIA IN THE HUMAN FETUS. R.B. Wijesuriya, R.C. Palma, K.J. Moise, and R.A. Bracey. Division of Perinatal Medicine, Department of Reproductive Medicine, UCSD School of Medicine, San Diego, CA 92103-8433 and Division of Maternal-Fetal Medicine, Department of Obstetrics and Gynecology, Baylor College of Medicine, Houston, TX 77030.

OBJECTIVE: To create an animal model for isoimmune hemolytic disease of the fetus using anti-red blood cell antibodies in fetal sheep.

STUDY DESIGN: Ten chronically catheterized fetal sheep were administered anti-red blood cell antibodies daily over a 10 day period while monitoring hemodynamic effects. Fetal blood was sampled daily for blood gases, chemistries, and complete blood counts. Fetal urine and amniotic fluid were analyzed for pH and chemistries, including glucose and lactate. Statistical analysis included Student's t-test and three-factor analysis of variance, where appropriate.

RESULTS: Two fetal sheep given low doses of antibodies underwent an insignificant decrease in hemoglobin and hematocrit while two others given moderate doses of antibodies showed a significant decline in fetal hematocrit. In 12 cases of IUGR (hematocrit change of 4.3 ± 1.0% vs. 12.2 ± 0.1%, p<0.05). With the moderate antibody infusion, arterial pCO2 declined though the pCO2 and pH remained stable. As hematocrit declined below 20%, lactate increased; potassium levels did not change. Slight decrease in hemoglobin and hematocrit while two other animals after day six following massive hemodynamic changes, the other two after day six following precipitous hematocrit drop to below 20%. Platelets declined 45% in the surviving sheep but dropped below 50,000 in fetuses that expired prior to completing the 10-day protocol (p<0.0001).

CONCLUSION: Anti-red blood cell antibodies can be used to create an immune-inducible fetal anemia model.
407 FETAL RESPONSE TO ACUTE PLATELET DESTRUCTION. R.B. Wolf, R.C. Palmaz, K.J. Moise, P.J. Richter, and R.A. Brake. Division of Perinatal Medicine, Department of Reproductive Medicine, UCSD School of Medicine, San Diego, CA 92103-8453 and Division of Maternal-Fetal Medicine, Department of Obstetrics and Gynecology, Baylor College of Medicine, Houston, TX 77030.

**OBJECTIVE:** To describe hemodynamic and hematologic alterations in response to acute platelet destruction in fetal sheep.

**STUDY DESIGN:** Ten chronically catheterized fetal sheep were administered antibodies developed in rabbits which reduced platelet counts. Antibodies were given by infusion over 30 minutes daily for up to 10 days while monitoring hemodynamic effects, blood gases, and chemistries. Statistical analysis included Student's t-test and analysis of variance, where appropriate.

**RESULTS:** Four fetal sheep given low to moderate doses of antibodies had a moderate decrease in platelets over several days while six others given higher doses of antibodies showed a marked platelet decline following antibody infusion (platelet change of 42.8% ± 9.6% vs. 95.1% ± 2.5%, p<0.001). At four hours, platelets had already decreased by 70.1% ± 5.7%, p<0.001. At the start of antibody infusion, fetal arterial pressure increased 15% with a concomitant reflex tachycardia (heart rate reduced 29%). The fetal heart rate returned to baseline at the completion of infusion, followed by sustained tachycardia (33% increase over baseline). After four hours, fetal pO2 had declined 15.6% ± 4.8% (p<0.05) and pH decreased by 0.05 ± 0.01 unit. The results were consistent with fetal acidemia.

**CONCLUSION:** Acute platelet destruction is associated with transient hypertension effects with subsequent marked tachycardia. Acute platelet destruction can be lethal when it is extensive. These effects may be mediated by vasoconstriction with subsequent impaired umbilical blood flow and placental function.


**OBJECTIVES:** We previously reported arginine vasopressin, causes redistribution of fetal blood flow and placental function. The purpose of this study was to investigate the possibility of endothelin-1 (ET-1) or atrial natriuretic peptide (ANP) for the transabdominal monitoring of fetal cerebral oxygenation in utero. Further studies are required to refine the technology and enable clinical application.

**RESULTS:** (Mean±S.E. *p<0.05)

<table>
<thead>
<tr>
<th>Control</th>
<th>2hr</th>
<th>6hr</th>
<th>12hr</th>
<th>24hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>7.36±0.01</td>
<td>7.37±0.01</td>
<td>7.36±0.08</td>
<td>7.34±0.02</td>
</tr>
<tr>
<td>pO2</td>
<td>21.7±1.0</td>
<td>14.3±0.9</td>
<td>14.1±0.6</td>
<td>14.0±0.7</td>
</tr>
<tr>
<td>pCO2</td>
<td>35.5±2.3</td>
<td>30.8±1.2</td>
<td>35.3±1.7</td>
<td>30.1±2.1</td>
</tr>
<tr>
<td>FHR</td>
<td>162±4</td>
<td>168±8</td>
<td>170±7</td>
<td>167±6</td>
</tr>
<tr>
<td>sBP</td>
<td>56.1±3.1</td>
<td>50.3±5.7</td>
<td>51.9±3.2</td>
<td>55.1±4.1</td>
</tr>
<tr>
<td>dBP</td>
<td>29.2±3.1</td>
<td>28.8±2.7</td>
<td>31.7±3.1</td>
<td>35.1±4.4</td>
</tr>
<tr>
<td>ET-1</td>
<td>10.6±1.9</td>
<td>20.4±4.3</td>
<td>18.2±2.5</td>
<td>20.3±5.0</td>
</tr>
<tr>
<td>ANP</td>
<td>20.3±5.5</td>
<td>23.0±4.7</td>
<td>20.9±7.2</td>
<td>49.2±13.4</td>
</tr>
</tbody>
</table>

**CONCLUSION:** Prolonged non-acidemic hypoxyxia induced the continuous increase in fetal plasma ET-1 and ANP levels. Fetal plasma ANP increased time dependently, but ET-1 plateaued during hypoxyxia. It is likely that ET-1 or ANP could maintain fetal redistribution of blood flow during chronic hypoxyxia.


**OBJECTIVE:** It has been demonstrated that optical spectroscopy in the near infrared (NIR) wavelength region can be used to monitor tissue oxygenation and blood volume. Our objective was to adapt this technology for the transabdominal evaluation of fetal cerebral blood oxygenation.

**STUDY DESIGN:** Patients undergoing the non-stress test (NST) for routine obstetric indications were approached for enrollment in the study. During the NST, a continuous wave (CW) spectrometer with 2.5 cm and 10 cm source-detector separations utilizing wavelengths of 760 nm and 850 nm (the wavelengths of deoxy- and oxyhemoglobin, respectively) was placed over the fetal head after ultrasonographic localization. Baseline shifts in the absorption spectra were correlated with uterine activity and changes in the fetal heart rate. Similarly, data from the 2.5 cm and 10 cm sensor/detector separations were compared to demonstrate interrogation of the maternal abdomen vs fetal brain.

**RESULTS:** Thirty-two patients agreed to enrollment in this study. Comparison of NIR measurements with fetal heart rate testing demonstrated an increase in fetal cerebral blood oxygenation and volume in association with spontaneous accelerations in the fetal heart rate. These changes were not observed with the 4 cm source/detector probe, indicating that only maternal abdomen hemodynamic changes were being measured at this separation.

**CONCLUSION:** Transabdominal NIR spectroscopy has great potential for the transabdominal monitoring of fetal cerebral oxygenation in utero. Further studies are required to refine the technology and enable clinical application.

410 EFFECT OF ESOPHAGEAL LIGATION ON AMNIOTIC FLUID VOLUME IN FETAL SHEEP. Larry C. Matsumoto, Cecilia Y. Cheung, Robert A. Brake, and Ljubica Bogic. Division of Perinatal Medicine, Department of Obstetrics and Gynecology, University of California at San Diego, La Jolla, CA 92039-0802.

**OBJECTIVE:** There are conflicting data as to whether amniotic fluid volume increases following fetal esophageal obstruction. Our objective was to determine the amniotic fluid volume changes over time following esophageal ligation. Another objective was to explore the role of the intramembranous pathway in mediating these volume changes.

**STUDY DESIGN:** The study was conducted in late gestation chronically catheterized fetal sheep. The trachea was ligated to eliminate the alantoic cavity. Five fetuses underwent esophageal ligation and five served as controls. On days 1, 3, 5, 7, and 9 following surgery, amniotic fluid volume and composition as well as urinary flow and composition and fetal and maternal arterial blood composition were determined. A three factor ANOVA was used for statistical analysis.

**RESULTS:** Amniotic fluid volume did not change in the control group and tended to decrease in the ligated esophagus group (p=0.042), averaging 510 ± 220 (SE) ml and 494 ± 136 ml, respectively, on day 9. Fetal urinary flow rate was lower in the ligated esophagus group (p=0.042), averaging 420 ± 95 ml/day compared to 579 ± 105 ml/day in the control group. Arterial samples from the mother and fetus did not suggest metabolic changes during any part of the study.

**CONCLUSIONS:** Amniotic fluid volume did not increase following fetal esophageal ligation. With the addition of urine volume plus fetal lung secretions (mean = 340 ml/day) net accumulation of amniotic fluid in excess of 6,000 ml was expected during the 9 day study in the ligated esophagus group. In view of the finding that amniotic fluid volume did not increase, it is clear that the absorptive capacity of the intramembranous pathway increased following esophageal ligation.

We speculate that VEGF is a mediator of this increase in permeability.
411 CHARACTERIZATION AND VIABILITY OF FETAL STEM CELLS THROUGHOUT GESTATIONAL AGE. Lucy A Bayer Zurello MD, Lottie A Adams BS, Despina Hoffman, Dorota Janecz BS, Margaret T Reece PhD. Baystate Medical Center, Dept. of OB/GYN, Tufts U. School of Medicine.

OBJECTIVE: To determine the quality and quantity of stem cells present in fetal cord blood of premature infants as compared to term infants.

METHODS: In this institutional approved study, fetal cord blood (FCB) was collected by venapuncture of the umbilical vein and processed within 48 hours. FCB was divided into 3 ml aliquots, and stem cells were separated from RBCs by lysis with Puregene solution. One pellet was used for initial characterization. The remaining pellets were stored in vapor phase liquid nitrogen. Cells were deposited on slides for morphological evaluation and fixed with acetone/methanol or 1% formalin. Slides were stained with hematoxylin/eosin for cell integrity analysis, scored from 1+ (poor) to 4+(excellent). The remaining slides were used for subsequent immunohistochemical determination of CD34 & CD38 antigens.

RESULTS: 148 specimens from 21 to 42 weeks were obtained from January 97 to July 98. Stem cells from pregnancies less than 35 weeks were substantially more fragile regardless of the mode of delivery, or the initial number of stem cell in the specimen. 10% of the slides were of poor quality (1+). 30% were fair (2+), 35% were good (3+) and 25% were considered excellent (4+). All good and excellent samples were in the >35 week group. Processing time of up to 48 hours had no effect on the fragility or viability of stem cell. Technically, 1% formalin appeared to be the best method of fixation for immunohistochemical analysis.

CONCLUSION: Despite high levels of fetal stem cells, younger fetuses may not be acceptable donors of FCB due to cellular fragility. Only 40% of samples were judged adequate for transplantation, and all were from pregnancies > 35 weeks. We conclude that technical questions concerning FCB viability and the quality of stem cells remain to be answered and it may be premature to recommend to our patients that they bank FCB at this time.

412 EFFECTS OF HYPOXIA IN THE NEAR TERM RAT ON THE DURATION OF GESTATION AND POSTNATAL DEVELOPMENT. G.J. Valenzuela1, H. Umezaki2, T. Imanura2, J. Pinches3, K.M. Kaushaff4 and C.A. Ducsay4. Dept. OB/Gyn, Arrowhead Regional MC, San Bernardino, CA1 and 4 and Dept of Perinatal Biology, School of Medicine, Loma Linda University, Loma Linda, CA2.

OBJECTIVE: Chronic stress can have profound effects on fetal development and outcome. Intrauterine growth retardation has been postulated to produce hypertension in human adults. Previous studies from our group have shown that 48h of maternal hypoxia near term can alter myometrial contractility. The present study was designed to determine the effects of maternal hypoxic exposure on the duration of gestation and postnatal growth.

STUDY DESIGN: Sixteen pregnant rats were equally divided between a normoxic control group and a chronic hypoxic group (exposure to hypoxia: 10.5% O2 from day 19 of gestation until delivery). All animals were allowed to deliver and neonatal weights were recorded at 24 h, 30 days and 90 days after delivery.

RESULTS: In the control group, 7 animals delivered on day 22 of gestation (term =22 days) while one animal delivered on day 29. In marked contrast, 7 of the hypoxic animals delivered on day 23, while one delivered on day 22. The incidence of delivery of dead neonates was 4.5% in the hypoxic animals compared to 0% in the controls. Twenty four hours after delivery, the neonatal group was significantly smaller than the control group (6.39±0.06 g vs 5.87±0.09 g for control and hypoxic groups respectively, p<0.05). By day 30 sex differences in weight were evident but there were no differences between control and animals exposed to in utero hypoxia. Similar results were observed on day 90 postpartum.

CONCLUSIONS: 1) Exposure to hypoxia during the latter part of gestation results in a significant increase in the length of gestation and neonatal mortality. 2) Following in utero hypoxia for 96 hours, neonatal weight is significantly reduced, but within 30 days, the weight of the pups is similar to the control group. We speculate that the delay in parturition is an adaptation to chronic hypoxic exposure potentially reducing the impact of intrauterine growth retardation.

413 EFFECTS OF ANTENATAL TRIIODOTHYRONINE ON CYCLIN A2 & D1 mRNA EXPRESSION IN LUNGS OF PRETERM LAMB. L. Chan, W. Salameh1, J. Yusuf1, T. Miller1, M. Wolfson1. Dept of Ob/Gyn & Physiology, Temple Univ Sch of Med, and Dept of Ob/Gyn, Jefferson Med College, Philadelphia, PA; Dept of Medicine, Harbor-UCLA, Torrance, CA.

OBJECTIVE: Cyclins are cell cycle proteins whose levels oscillate to mediate and facilitate cellular division and differentiation. We recently reported that antenatal intra- amniotic triiodothyronine (T3) of 100 ug significantly improves neonatal gas exchange and lung compliance in preterm lambs. The improvement in lung function was not accompanied by an increase in pulmonary surfactant production (J Soc Gynecol Invest 5(3):122-126, 1998). This study sought to characterize the effect of antenatal T3 on Cyclin A2 and D1 mRNA expression in fetal lungs.

STUDY DESIGN: Six fetal lambs (0.85 of term) were given 100 ug of intra-amniotic T3 under ultrasound guidance at 112±1 days gestation and delivered at 126±1 days (term≈149 days). 7 saline injected animals served as controls. Fetal lung tissue was obtained and total RNA was extracted and assayed by Northern analysis for the expression of Cyclin A2 & D1 mRNA. Intensity of the radiographic signal was assessed by densitometry and normalized for β-actin expression. Cyclin A2 & D1 expression was compared between groups using a non-paired Ttest.

RESULTS: Northern analysis of total RNA was unable to detect a Cyclin A2 message in fetal lung tissue. However, a Cyclin D1 message was detected and the β-actin normalized Cyclin D1 mRNA levels showed a 2 fold significant decrease in the T3 treated group (p<0.05).

CONCLUSIONS: A single 100 ug dose of antenatal intra-amniotic T3 given 2 weeks prior to delivery significantly decreased G1 cell cycle regulator Cyclin D1 mRNA levels in fetal lung tissue. We conclude that T3 decreases proliferation of parenchymal contractive tissue matrix and/or alveolar lung tissue. We speculate that the affected cells may either be arrested at G1 stage of the cell cycle or more likely commit to a more differentiated phenotype.


OBJECTIVE: In order to study the immunological function of the human fetus we performed MLC (mixed lymphocyte culture) of fetal liver and thymic cells. MLC is a functional test to determine HLA incompatibilities.

STUDY DESIGN: Human fetal liver and thymic tissue were obtained from abortions in weeks 6-16. Forty-seven fetuses were studied with one or more MLCs. The reactivity was determined by adding irradiated fetal liver, adult bone marrow and blood.

RESULTS: The results indicate that the human fetus is competent to react as early as the 11-12 weeks of gestation. In the very immature fetal livers (8 weeks) we were able to demonstrate an inhibited MLC.

CONCLUSIONS: Our data suggests that the human fetus can react against foreign transplantation antigens earlier than previous papers have claimed. The onset of reactivity seems to differ considerably between different fetuses. The present findings may explain some of the limited success in in-utero transplantations in human fetuses with normal immunological state.

OBJECTIVE: Temporal changes in the expression of nerve growth factor (NGF), which are highly associated with development and differentiation of the nerve cells, were investigated in relation to delayed neuronal death in ischemic-hypoxic newborn rats.

STUDY DESIGN: a) Ischemic-hypoxic animal model (Levine's model): After the left carotid artery in each 7-day-old newborn rat was ligated, animals were exposed to hypoxic conditions for 2 hours in a chamber at 33°C containing 3% oxygen. The rats were sacrificed at 24 hours, 48 hours, 72 hours, and 7 days after the ischemic-hypoxic treatment. Brain specimens were resected from the animals and fixed. b) Histopathologic examination: Sections were stained with hematoxylin-eosin (HE) or cresyl violet (CV). Front sections were immunohistochemically analyzed using polyclonal antibodies against NGF as primary antibodies.

RESULTS: a) Judging from histologic figures in HE sections, there were no abnormal features detected in the hippocampus 24 hours after ischemic-hypoxic treatment. However, 48 hours, 72 hours, and 7 days after the treatment, cellular degeneration was observed in 18%, 27%, and 36%, respectively of pyramidal cells in the CA3 region of hippocampus. b) At 24 hours after ischemic-hypoxic treatment in the hippocampus (when cellular degeneration of pyramidal cells was not yet observed), features of NGF signals did not differ from those in the nonischemic right hippocampus (control). In contrast, at 48 hours, 72 hours, and 7 days after ischemic-hypoxic treatment in the hippocampus, signals for NGF were negative in all pyramidal cells showing cellular degeneration.

CONCLUSION: Disappearance of NGF in the pyramidal cells was observed 48 hours after ischemic-hypoxic treatment in the hippocampus. There was no expression of NGF in delayed neuronal death cells. The association of ischemia and hypoxia may influence delayed neuronal death cells, which is related to cerebral palsy.

416 EFFECTS OF MAGNESIUM SULFATE DURING SEVERE HYPOXIA AT DIFFERENT GESTATIONAL AGES IN PREGNANT RATS. CA Standley*, E.D. Andrews*. Dept. Physiology, Midwestern University, Glendale, AZ 85308.

OBJECTIVE: Episodic hypoxia during pregnancy are detrimental to the fetus. Recent evidence indicates that magnesium sulfate (MgSO4) may have a protective function in newborns. In this experiment, we examined hypoxia independent of ischemia as a risk factor for cerebral injury and the potential protective effects of in utero exposure to MgSO4.

STUDY DESIGN: 56 timed-pregnant Long Evans rats were exposed to a 4 hour period of sustained hypoxia (internal inspired oxygen lowered to 8% with 3% CO2 and 89% N2 added) at gestational days (GD) 7, 12 or 17. Of these, 17 were pretreated with MgSO4 (250 mg/kg i.p. followed every 20 minutes with 27 mg/kg MgSO4 for two hours), while 19 received saline vehicle for two hours. Control rats (n=17) received saline and were exposed to room air at GD 7, 12 or 17. Rats were also exposed to room air at GD 7, 12 or 17. Rats were allowed to deliver their pups naturally and all mothers and pups were euthanized and perfused transcardially on postnatal day 1. Neuronal damage was assessed histologically using hematoxylin and eosin stained sections of the maternal brain. In addition, immunohistochemistry with glial fibrillary acidic protein was used to assess astrocytic proliferation.

RESULTS: Exposure to hypoxia was significantly increased in both the saline and MgSO4 treated hypoxic rats compared to control. Surprisingly, pups born to mothers that received MgSO4 were smaller than the saline hypoxic or control pups at both GD12 and GD17 (p<0.05). Severe hypoxia produced the most neuronal damage in the hippocampus and cortex at GD12. Across gestation, there was no significant neuroprotective effects of MgSO4 in the maternal brain.

CONCLUSION: The maternal brain appears to be sensitive to hypoxia at midgestation. Magnesium sulfate was not neuroprotective to maternal neuronal damage and in fact, was associated with growth retardation of fetuses. We are currently analyzing neuronal histology in the pup brains from this study.


OBJECTIVE: Potassium channel activation has been shown to decrease uterine tone and is a target for inhibiting uterine activity in the treatment of preterm labor. In addition, potassium channel activation also appears to be involved in oocyte maturation. The specific potassium channels responsible for these channel currents have not been identified but are known to respond to agents such as pinacidil and can be inhibited by glibenclamide. These findings suggest the presence of an ATP-Sensitive potassium channel which is a complex of a weak inwardly rectifying potassium channel, Kir6.1 or Kir6.2, and a sulfonylurea binding regulatory subunit, SUR1 or SUR2.

STUDY DESIGN: The technique of reverse transcriptase-polymerase chain reaction (RT-PCR) was used to detect the presence of SUR1, SUR2, Kir6.1 and Kir6.2 mRNAs in the ovary and myometrium of the pregnant rat. In situ hybridization histochemistry was used to identify the specific cell types expressing these mRNAs.

RESULTS: RT-PCR analysis identified SUR1, SUR2B and Kir6.1 mRNA expression in rat myometrium and ovary during gestation. There was no evidence for expression of Kir6.2 mRNA in the ovary or the myometrium of the pregnant rat. In situ hybridization histochemistry localized expression of SUR2B and Kir6.1 to uterine myocytes and granulosa cells of the corpus luteum. The cells expressing SUR1 mRNA could not be identified because of the low abundance of this mRNA. SUR1, SUR2B and Kir6.1 mRNAs were also observed in the placenta by in situ hybridization histochemistry.

CONCLUSION: The results suggest that the major ATP-sensitive potassium channel expressed in the myometrium and the corpus luteum during pregnancy is a complex of SUR2B and Kir6.1. This protein is a potential target for therapeutic intervention.
419 VASOCONSTRICTIVE ACTIVITY OF MECONIUM STAINED AMNIOTIC FLUID ON THE HUMAN PLACENTAL VASCULATURE.

G. Holcberg, M. Huleihel, M. Katz, D. Segal, A. Malek, M. Mazor, H. Schneider. Dept. Ob/Gyn, Soroka Medical Center, Ben-Gurion University of The Negev, Israel and Universitatsspital Frauenklinik Bern, Switzerland

OBJECTIVE: To determine the effect of meconium stained amniotic fluid (MSAF) on the placental vasculature.

STUDY DESIGN: Isolated placental cotyledons were dually perfused with fetal perfusion pressure used as an index of vascular resistance. MSAF was collected from patients after artificial rupture of membranes and was diluted by dilution 1:2; 1:4; 1:8; 1:16 and a spectrophotometric determination of meconium concentration in amniotic fluid was performed. Optical density (OD) varied between 0 to 35.0 units per g and bolus injections of 1.0 ml of MSAF at different concentrations were injected into the fetal circulation. Statistical significance of response to MSAF injection was determined by paired t test.

RESULTS: Bolus injection of MSAF into the fetal circulation resulted in a concentration dependent increase in perfusion pressure. The highest OD resulted in a greater change in perfusion pressure as compared to more diluted MSAF (p=0.0001). After high OD amniotic fluid injections, the provoked contractions lasted longer than those observed with diluted MSAF (p=0.006). MSAF after dialysis did not exhibit any vasoconstrictive effect.

CONCLUSION: Meconium is a vasoconstrictive agent in the fetal-placental vasculature and its activity is concentration dependent.

421 THE EFFECT OF INDOMETHACIN ON THE HUMAN PLACENTAL VASCULATURE IN NORMAL AND MECONIUM EXPOSED PLACENTAE.

G. Holcberg, M. Huleihel, M. Katz, O. Sapir, A. Malek, M. Mazor, H. Schneider. Dept. Ob/Gyn, Soroka Medical Center, Ben-Gurion University of The Negev, Israel and Universitatsspital Frauenklinik Bern, Switzerland

OBJECTIVE: To study the effect of indomethacin on the vasculature of isolated perfused human placental cotyledon in normal and meconium pre-treated placentae.

STUDY DESIGN: Isolated placental cotyledons were dually perfused with fetal perfusion pressure used as an index of vascular resistance. Meconium stained amniotic fluid (MSAF) with optical density of (OD) 10 to 22.0 units per g was used. The effect of indomethacin (100 μl/1ml continuous perfusion) was established in the fetal-placental vasculature in all placentas in the presence or absence of MSAF fluid when bolus injections of 1.0 ml MSAF at different concentrations were injected into the fetal circulation.

RESULTS: A significant vasoconstrictor response to MSAF was achieved in normal placentae. Bolus injection of MSAF into the fetal circulation resulted in a concentration dependent increase in perfusion pressure (47.25±25.6 vs. 101.6±24.1 mmHg, p=0.004). Indomethacin reduced significantly the basal perfusion pressure from 47.25±25.6 to 19.8±13.7 mmHg, (p=0.03) Significant attenuation of vasoconstrictor response to MSAF occurred in the presence of indomethacin (46.1±22.7 vs 20.7±19.4mmHg, p=0.009).

CONCLUSIONS: Indomethacin causes a reduction in resting pressure of fetal-placental vasculature in vitro and is capable to attenuate the vasoconstrictory activity of MSAF. The mechanism of such activity may be explained by the inhibitory effect of indomethacin on the prostaglandin-mediated pathways.

420 PROINFLAMMATORY CYTOKINE EXPRESSION IN THE HUMAN PLACENTAL VASCULATURE.

G. Holcberg, M. Huleihel, M. Katz, O. Sapir, A. Wiznitzer, M. Mazor, Dept. Ob/Gyn, Soroka Medical Center, Ben-Gurion University of The Negev, Beer Sheva, Israel

OBJECTIVE: To examine the expression levels of IL-1β, IL-6 and TNF-α levels in the vasculature of isolated human placental cotyledon in normal and meconium pre-treated placentae.

STUDY DESIGN: Isolated placental cotyledons were dually perfused in 6 normal placentae and two small placentae (230-250 g.) obtained from intrauterine growth retarded fetuses (IUGR). Fetal perfusion pressure was used as an index of vascular resistance. Perfusate samples from fetal site were collected every 30 min. (4-12 hours) and examined by ELISA for IL-1β, IL-6 and TNF-α levels. In 6 additional placenta bolus injections of 1.0 ml meconium stained amniotic fluid (MSAF) with optical density of 2.0 to 35.0 units per g were injected into the fetal circulation and samples were collected. Statistical significance was determined by paired t test.

RESULTS: IL-1β levels were detected only after bolus injection of MSAF (53.3±0.0 ng/ml p=0.0001). A significant vasoconstrictor response was observed after bolus injection of MSAF into the fetal-placental circulation (p=0.004). No activity of IL-6 was found during 4-12 hours of perfusion. TNF-α levels were significantly higher in the IUGR placentae than in those with normal placentae and only after 120 min of perfusion (55.3±18.0 ng/ml, p=0.04).

CONCLUSIONS: In normal human placentae IL-1β and IL-6 concentrations were not detected during 4-12 hour of perfusion. A significant increase of IL-1β concentration was observed after injection of MSAF. TNF-α elevation was found in IUGR perfused placentas. Our data suggest that hypoxia of placental vasculature caused by meconium vasoconstriction as well as IUGR can lead to a significant increase in proinflammatory cytokines.
422 MINIMALLY ELEVATED MSAFP IS ASSOCIATED WITH AN INCREASED RISK FOR IUGR. GA Macones, S Marder, D Stamilio, H Schdev, MA Morgan. Dept of OB/GYN, Univ. of Pennsylvania Health System, Philadelphia PA.

**OBJECTIVE:** To determine whether minimal elevations of mid trimester MSAFP are associated with intrauterine growth retardation (IUGR) and risk for IUGR.

**STUDY DESIGN:** We performed a retrospective cohort study of over 1900 women who had a mid trimester maternal serum AFP (MSAFP) between the years 1994 and 1997. Women with major congenital abnormalities and multiple gestations were excluded. The medical and prenatal records of each of these women were reviewed, and information on risk factors for IUGR, potential confounding factors, and pregnancy outcomes were abstracted. IUGR was defined as a delivery birthweight of less than the 10th percentile using standard birthweight curves. We used standard bivariate and stratified analyses to select variables for inclusion into our logistic regression models. In these models, we performed separate analysis using various MSAFP cut-offs (i.e., 1.5 MOM, 2.0 MOM, 2.5 MOM).

**RESULTS:** Out of our total cohort of 1997 women, there were 144 cases of IUGR (prevalence=7.2%). Factors associated with IUGR included African-American race (adjusted OR=2.1, 95% CI 1.3-3.5), tobacco use (adjusted OR=1.7, 95% CI 1.1-2.7), cocaine use (adjusted OR=2.4, 95% CI 1.1-5.3). Level of mid trimester MSAFP was also associated with IUGR (see table).

<table>
<thead>
<tr>
<th>MSAFP Cutoff</th>
<th>Adjusted OR</th>
<th>95% CI</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.0 MOM</td>
<td>8.0</td>
<td>2.3-28.1</td>
<td>0.001</td>
</tr>
<tr>
<td>2.5 MOM</td>
<td>4.3</td>
<td>1.9-9.9</td>
<td>0.001</td>
</tr>
<tr>
<td>2.0 MOM</td>
<td>2.4</td>
<td>1.4-4.2</td>
<td>0.002</td>
</tr>
<tr>
<td>1.5 MOM</td>
<td>1.6</td>
<td>1.1-2.4</td>
<td>0.01</td>
</tr>
</tbody>
</table>

**CONCLUSIONS:** We observed a positive association between the level of MSAFP elevation and the risk of IUGR. However, after controlling for confounding factors, even minimal elevations of MSAFP (1.5 MOM) are significantly related to IUGR. This suggests that increased surveillance may be necessary even for those with lesser degrees of MSAFP elevation.

423 COMPARING A NEURAL NETWORK TO MULTIVARIABLE MODELING FOR PREDICTING OUTCOMES OF TRAILS OF LABOR IN THOSE WITH A PRIOR C-SECTION. GA Macones, JH Holmes, N Hausman, R Edelstein, MA Morgan. Dept of OB/GYN and the Dept of Biostatistics and Epidemiology, Univ of PA Health System, Philadelphia PA.

**OBJECTIVE:** To compare the sensitivity and specificity of a neural network to standard multivariable modeling for predicting outcomes in those undergoing a trial of labor (TOL) after a prior cesarean section (CS).

**STUDY DESIGN:** We performed a case-control study at our institution among patients who underwent a TOL after a prior CS. A case (N=100) was defined as one who underwent a TOL and "failed" (i.e., repeat C-S), while a control (N=300) was defined as one who underwent a TOL and delivered vaginally after a prior CS. A case (N=100) was defined as one who underwent a trial of labor and "failed" (i.e., repeat C-S), while a control (N=300) was defined as one who underwent a TOL and delivered vaginally after a prior CS.

**RESULTS:** Using multivariable modeling, we were unable to achieve the same degree of sensitivity and specificity as obtained with the multivariable predictive index. In fact, the maximum sensitivity of the neural network for predicting failure was 49% with a specificity of 80%.

**CONCLUSIONS:** Standard multivariable modeling yielded more favorable test characteristics than a neural network in predicting the TOL outcomes in those with a prior CS.

424 PREDICTION OF NEWBORN INFANT CONDITION IN THE DELIVERY ROOM AFTER VAGINAL BIRTH AT TERM. JM Pearlman, DD McIntire, JF Leveno. Dept. Ob/Gyn, Univ. of Texas Southwestern Medical Ctr, Dallas, Texas.

**OBJECTIVE:** To determine if traditional markers of potential intrapartum fetal compromise can be used to predict which term infants delivered vaginally might need resuscitation in the delivery room (DR).

**STUDY DESIGN:** Retrospective analysis of infant condition in the delivery room in relation to obstetric markers of potential fetal compromise to include: fetal heart decelerations, meconium, and chorioamnionitis in 93,579 term infants delivered vaginally between January 1988 and 31 December 1997. Chi-square contingency table analysis was used for comparison of outcomes.

**RESULTS:**

<table>
<thead>
<tr>
<th>Newborn Condition in DR</th>
<th>None</th>
<th>Decelerations</th>
<th>Meconium</th>
<th>Chorioamnionitis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>No. infants</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45587</td>
<td>(100)</td>
<td>38 (0)</td>
<td>39 (0)</td>
<td>1.6</td>
</tr>
<tr>
<td>(100)</td>
<td>(100)</td>
<td>(100)</td>
<td>(100)</td>
<td>0.002</td>
</tr>
<tr>
<td>5-Min Apgar &lt;3</td>
<td>3 (1)</td>
<td>15 (2)</td>
<td>3 (1)</td>
<td>2 (1)*</td>
</tr>
<tr>
<td>(13.3)</td>
<td>(13.3)</td>
<td>(13.3)</td>
<td>(13.3)</td>
<td>0.001</td>
</tr>
<tr>
<td>Umbilical artery</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pH &gt; 7.0</td>
<td>39 (1)</td>
<td>37 (3)</td>
<td>15 (2)</td>
<td>1 (2)</td>
</tr>
<tr>
<td>(1.0)</td>
<td>(1.0)</td>
<td>(1.0)</td>
<td>(1.0)</td>
<td>0.001</td>
</tr>
<tr>
<td>Ambu bag</td>
<td>348 (1)</td>
<td>35 (2)</td>
<td>305 (3)</td>
<td>14 (3)</td>
</tr>
<tr>
<td>(9.0)</td>
<td>(9.0)</td>
<td>(9.0)</td>
<td>(9.0)</td>
<td>0.001</td>
</tr>
<tr>
<td>Intubation</td>
<td>28 (1)</td>
<td>17 (1)</td>
<td>155 (2)</td>
<td>0</td>
</tr>
<tr>
<td>(0.9)</td>
<td>(0.9)</td>
<td>(0.9)</td>
<td>(0.9)</td>
<td>0.001</td>
</tr>
<tr>
<td>ICN admix</td>
<td>29 (1)</td>
<td>26 (2)</td>
<td>24 (3)</td>
<td>7 (1)</td>
</tr>
<tr>
<td>(1.0)</td>
<td>(1.0)</td>
<td>(1.0)</td>
<td>(1.0)</td>
<td>0.001</td>
</tr>
</tbody>
</table>

*p* different than other columns, p < .05.

**CONCLUSIONS:** 1) The combination of fetal heart rate decelerations, meconium and chorioamnionitis is a better predictor of newborn compromise than any single factor. 2) This combination is infrequent occurring in 5/1000 women delivered vaginally at term.

425 PREVALENCE AND RISK FACTORS FOR PROM AT OR NEAR TERM IN AN URBAN SWEDISH POPULATION. Lars Ladfors, Lars Mattsson, Margareta Eriksson, Jan Milsom. Dept. Ob/Gyn, Sahlgrenska University Hospital, University of Göteborg, Sweden.

**OBJECTIVE:** This study was designed to determine the prevalence and identify risk factors for prelabour rupture of the membranes (PROM) at or near term in an urban Swedish population.

**STUDY DESIGN:** Retrospective analysis of infant condition in the delivery room in relation to obstetric markers of potential fetal compromise to include: fetal heart decelerations, meconium, and chorioamnionitis in 93,579 term infants delivered vaginally between January 1988 and 31 December 1997. Chi-square contingency table analysis was used for comparison of outcomes.

**RESULTS:** The prevalence of PROM at or near term in the urban Swedish population was 12.9 % and about 20% of the women had experienced PROM at delivery. The medical and prenatal records of cases and controls were reviewed and information on over 90 variables was abstracted. We then compared cases to controls with standard bivariate and multivariable analyses. The sensitivity and specificity recorded. Using the same data, a multivariable back-propagation neural network was developed, trained, and tested. The network was tuned on numerous parameters, including error tolerance, density of hidden layers and connections, and learning rate to obtain the maximum sensitivity and specificity.

**RESULTS:** The final multivariable model included 4 variables- a prior successful VBAC, drug use, cervical dilation on admission, and the need for pitocin induction. Using multivariable modeling, we were able to achieve sensitivity for "failure" of 80% and a specificity of 62%. Despite using multiple combinations of variables in the neural network, we were unable to achieve the same degree of sensitivity and specificity as obtained with the multivariable predictive index. In fact, the maximum sensitivity of the neural network for predicting failure was 49% with a specificity of 80%.

**CONCLUSIONS:** Standard multivariable modeling yielded more favorable test characteristics than a neural network in predicting the TOL outcomes in those with a prior CS.

OBJECTIVE: Recent evidence indicates that contractility-associated proteins may be differentially expressed in myometrium during pregnancy and labour. The purpose of this study was to test the hypothesis that two proteins (Gs and connexin 43) involved in contractility are differentially expressed in upper and lower segment myometrium during spontaneous labour.

DESIGN: Upper and lower segment myometrial samples were collected at the time of caesarean section in 20 labouring and 20 non-labouring women (at term). Upper segment samples were obtained using Wolf laparoscopic biopsy forceps. Myometrial lysates were prepared for SDS-PAGE and Western blotting with specific Gs and connexin 43 (Cx-43) antibodies.

RESULTS: Gs expression was similar in both upper and lower segments from non-labouring and spontaneous labouring women; whereas Cx-43 expression was greater in upper segment compared with lower segment myometrium.

CONCLUSIONS: An increased expression of Cx-43 in upper segment myometrium may facilitate the effective propagation of contractions from the fundus to lower segment. The uniform expression of Gs may ensure the same degree of relaxation in the uterus during pregnancy and between contractions, during labour.

HUMAN FETAL AMNION APOPTOSIS IS ASSOCIATED WITH LABOR AT TERM. C.D. Hsu, L.C. Lu*, R.J. Liang*, H Basheera*, H Harinab*, J.A. Copel. Dept of Ob/Gyn, Yale University School of Medicine, New Haven, CT.

OBJECTIVES: To characterize whether apoptosis of human fetal amnion was associated with labor at term.

STUDY DESIGN: Human fetal membranes were obtained from term patients with labor or elective cesarean section (C/S) without labor. Apoptosis was performed using fluorescein labeled ApopTag® kit which was based on the TUNEL (Terminal dUTP Nuclear End Labeling) assay. This assay identifies apoptotic nuclei with green fluorescence at 485 nm and all nucleated cells with red fluorescent neutral stain with propidium iodide in the amnion epithelial cells. Five random fields of each specimen were blindly read by investigators. Percent apoptosis of total fields was calculated and compared between the two groups (n=15 respectively). Mann-Whitney U test and coefficients of variance were used for statistical analyses. Data are expressed as medians with ranges.

RESULTS: There were no significant differences in maternal age, gestational age, parity and race between the two groups. Patients with term labor had a significantly higher percent apoptosis in fetal amnion epithelial cells than those with elective C/S without labor (25.1%, range 0.0 to 100% vs. 0.0%, range 0.0 to 0.0%, P<0.005). Inter-observer and intra-observer were 8.5% and 9.2% respectively.

CONCLUSIONS: Our data indicate that human fetal amnion undergo apoptosis and are associated with labor at term. The mechanisms regulating apoptosis at term labor remain to be determined.

HUMAN MYOMETRIUM APOTOPSIS IS ASSOCIATED WITH LABOR AT TERM. R.D. Durand, C.A. Shalghrenta*.

OBJECTIVES: To determine if evidence suggested by PROM (membrane rupture) alone, or even by PROM and time, is associated with labor at term.

STUDY DESIGN: All women at term between 20 and 41 weeks gestation were reviewed to determine if labor had been induced or spontaneous delivery was achieved. The characteristics of those who delivered spontaneously and those who were induced were compared. Labor was defined as delivery within 24 hours. Analysis was performed by the Mann-Whitney U test and coefficients of variance were used for statistical analyses. Data are expressed as medians with ranges.

RESULTS: Rates of labor induction were significantly different between a university hospital and two community hospitals. Induction of labor was more frequent in community hospitals than in a university hospital, and was more likely to be medically indicated. Indications for induction were often not cited or were for reasons other than those suggested by the ACOG (community hospital A, 45%; community hospital B, 33.7%; university hospital, 5%). The presence of a favorable cervix at term was the most common reason for labor induction at community hospital B (26%). Cesarean section rates among women being induced were not significantly different between the hospitals (university hospital 18%; community hospital A, 15%; community hospital B, 11%).

CONCLUSIONS: Induction of labor was more frequent in community hospitals than in a university hospital, and was more likely to be medically indicated at the university hospital. The more frequent inductions at the community hospitals could not result in higher cesarean section rates among women requiring intervention.

RANDOMISED TRIAL COMPARING ORAL MISOPROSTOL TO INTRA-AMNIOTIC PROSTAGLANDIN F2a FOR SECOND TRIMESTER PREGNANCY TERMINATIONS IN NULLIPAROUS PATIENTS. G. Marquette, L. Doutigny*, D. Rinfret*, Department of Obstetrics and Gynaecology, Sainte-Justine Hospital, University of Montreal, Montreal (Qc), Canada.

OBJECTIVE: The aims of this study were to compare 1) the success rate of an initial treatment and 2) proportion of retained placentas, during second trimester pregnancy terminations using oral misoprostol with intramionic PgF2a in nulliparous patients.

STUDY DESIGN: In this randomised controlled study, 79 nulliparous patients had laminaria inserted after informed consent. The next day, the patients were randomised to either misoprostol 400 μg p.o. Q4 h for 4 doses or PgF2a 40 mg injected by amniocentesis. Success of treatment was defined as complete evacuation within 24 hours of initiation of medication. Seventy-eight patients were required if α = 0.05; β = 0.2.

RESULTS: Both groups were comparable for maternal age, gestational age, indication for termination, and laminaria use. The success rate for initial treatment with misoprostol was 24/38 (63%) and was 34/39 (87%) with PgF2a (p = 0.01). The proportion of retained placentas was 8% for the misoprostol group and 23% in the PgF2a group (p = 0.05).

CONCLUSION: Using this protocol in nulliparous patients, intraamniotic PgF2a was more successful in inducing second trimester abortion than oral misoprostol, but carried a higher risk of retained placentas requiring intervention (D + C).


OBJECTIVE: To compare the rates of indications for labor induction between a university hospital and two community hospitals.

STUDY DESIGN: All cases of labor induction over a six month period (Oct. 1, 1997 to Mar. 31, 1998) were reviewed at the university teaching hospital and at two community hospitals (n=574). Medical records were retrospectively reviewed by a trained abstractor using a standardized form to determine maternal characteristics, reason for induction, and perinatal outcomes. Data were analyzed using the Chi-square test.

RESULTS: Rates of labor induction were significantly different between the three hospitals: university, 18.9%; community hospital A, 21.4%; community hospital B, 33.7% (p<0.001). In the community hospitals, the indication for induction was often not cited or was for reasons other than those suggested by the ACOG (community hospital A, 45%; community hospital B, 56%; university hospital, 5%). The presence of a favorable cervix at term was the most common reason for labor induction at community hospital B (26%). Cesarean section rates among women being induced were not significantly different between the hospitals (university hospital 18%; community hospital A, 15%; community hospital B, 11%).

CONCLUSIONS: Induction of labor was more frequent in community hospitals than in a university hospital, and was more likely to be medically indicated at the university hospital. The more frequent inductions at the community hospitals did not result in higher cesarean section rates among cases of induction.
430 MISOPROSTOL FOR CERVICAL RIPENING AND LABOR INDUCTION: IMPACT ON THE CESAREAN DELIVERY RATE (A META-ANALYSIS) L. Sanchez-Ramos, DE Peterson, Department of Obstetrics & Gynecology, University of Florida, Jacksonville, FL.
OBJECTIVE: To evaluate the role of misoprostol as a cervical ripening and labor induction agent by assessing its impact on the cesarean delivery rate.
STUDY DESIGN: Randomized clinical trials (RCTs) of misoprostol for cervical ripening and labor induction were identified using electronic databases and references cited in original studies. Two blinded investigators performed independent data abstraction of RCTs comparing cesarean delivery rates and indications between patients allocated to receive either misoprostol or controls. We calculated an estimate of the odds ratio (OR) and risk difference for dichotomous outcomes using both random and fixed-effects models.
RESULTS: Thirty RCTs met criteria for meta-analysis. Of 3999 patients enrolled, 1993 received misoprostol and 2006 were controls. Patients allocated to receive misoprostol had a lower cesarean rate (16.8%) than those receiving other agents (18.8%) (OR 0.88, 95% CI 0.75-1.02). After sensitivity analysis was performed with subsequent identification and elimination of a highly heterogeneous trial, the difference in cesarean delivery was noted to be significantly lower for those receiving misoprostol. Although no differences were noted in cesarean rates performed for FHR abnormalities, dose of misoprostol, control agents, or hospital setting, significantly less cesareans were performed for failed induction in the misoprostol group (OR 0.20 95%CI 0.10-0.38).
CONCLUSIONS: The use of misoprostol for cervical ripening and labor induction is associated with a reduction in cesarean deliveries.

OBJECTIVE: To compare the safety and efficacy of oral misoprostol to Foley catheter plus oxytocin (control group) for induction of labor in patients with unfavorable cervix.
STUDY DESIGN: 200 patients requiring induction with a Bishop Score (BS) ≤5 were randomized to receive oral misoprostol or a cervical Foley catheter plus oxytocin. Induction criteria were singleton pregnancy, ≥27 weeks gestation, vertex presentation, intact membranes, and reassuring fetal heart rate. Patients randomized to oral misoprostol received 50 μg every 4 hr up to 5 doses or until adequate contraction pattern. Those in the control group had the Foley catheter removed after 12 hrs if it had not spontaneously expelled and oxytocin was administered intravenously by a standard incremental infusion protocol to a maximum dose of 30 μIU/min. The primary outcome of the trial was time from induction to delivery. Secondary outcomes were percent cesarean section, and potential side effects. Results were analyzed by t-test, chi-square, and Log rank sum tests, with p<0.05 significant.
RESULTS: There were no differences between the misoprostol and control group regarding Bishop score, gestational age, indication for induction, use of epidural anesthesia or multiparity (60% vs 58%). The incidence of cesarean section was similar in both groups (24% vs 22%). However, the incidence of patients having vaginal delivery within 24 hrs was lower in the misoprostol group (72% vs 85%, p=0.005). There were no differences between groups regarding incidence of meconium, chorioamnionitis, or 5 minute Apgar score ≥7. However, the incidence of hyperstimulation was significantly lower in the Misoprostol group (4 vs 13%, p=0.06). Table below describes median time to delivery (total) and by parity.

<table>
<thead>
<tr>
<th>Misoprostol (n=100)</th>
<th>Pit/Foley (n=100)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median induction-delivery (hr)</td>
<td>18.4</td>
<td>14.4</td>
</tr>
<tr>
<td>Nulliparas</td>
<td>23.3</td>
<td>17.2</td>
</tr>
<tr>
<td>Multiparas</td>
<td>12.3</td>
<td>12.7</td>
</tr>
<tr>
<td>Median time to 24 cm (hr)</td>
<td>11</td>
<td>6.3</td>
</tr>
<tr>
<td>Nulliparas</td>
<td>13</td>
<td>6.6</td>
</tr>
<tr>
<td>Multiparas</td>
<td>6.1</td>
<td>5.3</td>
</tr>
</tbody>
</table>

CONCLUSION: Oral misoprostol is associated with significantly longer time from induction to delivery as compared to mechanical dilatation plus oxytocin in patients with unfavorable cervix. This effect is particularly evident in nulliparous women.

432 COMPARISON BETWEEN INTRACERVICAL PGE2, AND SUPRACERVICAL MISOPROSTOL FOR CERVICAL RIPENING. L. Hudonx, MA Belfort, K Dormanx, LA Wilkins, KJ Moise, Jr. Dept. Of OB-Gyn., Division of Maternal-Fetal Medicine, Baylor College of Medicine, Houston, Texas.
OBJECTIVE: To assess the clinical efficacy of pharmacologic, mechanical, and combination techniques of preinduction cervical ripening.
STUDY DESIGN: Patients presenting for induction of labor at ≥37 weeks with a Bishop score ≤4 were randomized to receive either PG or Foley. Patients with previous cesarean delivery, positive antenatal GBS culture, ruptured membranes, or a contraindication to a vaginal delivery were excluded. Six hours after the placement of PG, the Bishop score was reassessed and additional PG vs induction of labor with oxytocin was elected based on the cervical exam. A Foley catheter was placed above the internal os, inflated with 40ml of sterile water and allowed to remain in place until spontaneously expelled or for a maximum of 16 hours. Intrauterine oxytocin was then administered to induce labor. The primary outcome was to demonstrate a 20% reduction in the rate of cesarean delivery when using the Foley catheter. An interim analysis was performed to evaluate the efficacy and safety of the Foley catheter as compared to PG.
RESULTS: 56 patients were randomized to the Foley group while 55 patients were randomized to the PG group. Both groups were similar with respect to median gravidity, parity, gestational age at induction, maternal age, and ethnicity. There was no difference in the rate of cesarean delivery between the groups (69.6% with Foley vs 67.8% with PG, p=0.27). The Foley catheter was associated with a significantly greater improvement in the median Bishop score compared to PG (p=0.001). The difference between the groups in the incidence of chorioamnionitis, duration of postpartum stay and Apgar scores at 1 and 5 minutes. No episode of fetal bradycardia, uterine hyperstimulation, bleeding or pain was associated with cervical ripening in either group.
CONCLUSION: Although the supracervical Foley catheter did not prove superior in reducing the rate of cesarean delivery in this interim analysis, efficacy in improving the Bishop score proved superior to intracervical PGE2. The safety, ease of administration and the cost of the Foley delivery (<$115 for each dose of PGE2) makes this method the preferred agent for cervical ripening.

OBJECTIVE: To assess the clinical efficacy of pharmacologic, mechanical, and combination techniques of preinduction cervical ripening.
STUDY DESIGN: From Mar97- Aug98, all patients presenting to Lehigh Valley Hospital for induction were randomly assigned to 3 ripening groups: Misoprostol (250 μg vaginal q 3 hrs, max 4 doses), intracervical Foley catheter (24 F, 50cc, max 12 hrs), combination intracervical PGE2 gel and Foley (0.5 mg intracervical with 24 F, then 3 mg vaginal, max 4 doses). Variables analyzed included demographics, indication, gestational age, Bishop score, biometric parameters, mode of delivery, maternal or neonatal complications, length of stay, utilization of epidural, amniotomy, and oxytocin for labor. The main outcome variables were total time from the start of ripening, active labor, and oxytocin delivery.
RESULTS: The pertinent variables of the 205 patients are listed below.

<table>
<thead>
<tr>
<th>Misoprostol n=65</th>
<th>Foley n=71</th>
<th>Foley+Gel n=69</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ripe-Delivery (min)</td>
<td>1036±422</td>
<td>1020±465</td>
<td>1105±455</td>
</tr>
<tr>
<td>Labor-Delivery (min)</td>
<td>455±374</td>
<td>476±356</td>
<td>535±361</td>
</tr>
<tr>
<td>Oxytocin-Delivery (min)</td>
<td>564±427</td>
<td>608±397</td>
<td>649±442</td>
</tr>
<tr>
<td>C-Section (%)</td>
<td>20.0</td>
<td>21.1</td>
<td>26.1</td>
</tr>
<tr>
<td>No Oxytocin Required</td>
<td>18.5</td>
<td>0</td>
<td>7.2</td>
</tr>
<tr>
<td>Uterine Tachysystole (%)</td>
<td>38.5</td>
<td>12.7</td>
<td>11.6</td>
</tr>
</tbody>
</table>

Although the 2 Foley groups demonstrated a greater change in Bishop score at 3 and 6 hrs compared to Misoprostol, this difference was not apparent at 9 and 12 hrs. No other variables achieved significance.
CONCLUSION: Despite the high rate of uterine tachysystole with Misoprostol, there was no increase in the rate of c-section for fetal heart rate abnormalities. Although the 2 Foley groups required oxytocin more often, there was no improvement in ripening or oxytocin to delivery time. There appears to be no benefit to the addition of PGE2 gel to the Foley catheter. Pharmacologic (Misoprostol) and mechanical (intracervical Foley) ripening appear to have similar efficacy with an overall low rate of c-section (22.4%) and high rate of delivery within 24 hrs (86.8%).
CERVICAL RIPENING: A RANDOMIZED CLINICAL TRIAL OF AN INTRACERVICAL BALLOON CATHETER COMBINED WITH EITHER INTRAVAGINAL DINOPROSTONE OR MISOPROSTOL FOR CERVICAL RIPENING.

STUDY DESIGN: Patients admitted for labor induction with a singleton pregnancy and a Bishop score of 5 or less were randomized to receive either 4 mg of dinoprostone gel intravaginally every 4 hours or 25 μg misoprostol intravaginally every 3 hours after the intracervical placement of a balloon catheter. The catheter was removed at 12 hours and no further ripening agent was given. Patients not entering active labor, having ruptured membranes without a delay, or having active labor were randomized to the other arm. The primary outcome measure was the length of time for cervical ripening (Bishop score ≥ 8 or cervical dilatation ≥ 3). Secondary outcome variables included induction to delivery time, vaginal delivery within 24 hours, need for oxytocin augmentation, incidence of hyperstimulation or meconium, and cost of ripening agent.

RESULTS: Sixty-three patients received PGE gel and 63 patients received misoprostol. The time for cervical ripening was significantly less in the PGE group than the misoprostol group (6.5 ± 5.1 vs 9.2 ± 5.4 hours; p < 0.001). Among vaginal deliveries, the mean time to delivery was similar between groups (11 ± 5.0 vs 13 ± 6.3 hours; p = 0.25). No difference in the number of patients delivering vaginally within 24 hours, the need for oxytocin augmentation, and the incidence of hyperstimulation or meconium and cesarean section rates between the two groups. The average cost of cervical ripening agent was significantly less in the misoprostol group compared to the PGE group ($60 ± 75 vs $350 ± 147; p < 0.05).

CONCLUSION: When combined with an intracervical balloon catheter, intravaginal dinoprostone gel is associated with a more rapid cervical ripening compared to misoprostol. However, there was no difference in induction to vaginal delivery interval, number of vaginal deliveries within 24 hours or the rate of cesarean section. The cost of misoprostol is significantly less than that for dinoprostone gel.

A COMPARISON OF ORALLY ADMINISTERED MISOPROSTOL TO VAGinally ADMINISTERED MISOPROSTOL FOR CERVICAL RIPENING AND LABOR INDUCTION

MATERIAL AND METHODS: 220 subjects with medical or obstetric indication for labor induction and unassisted vaginal delivery were randomly assigned to receive orally administered or vaginally administered misoprostol. Fifty micrograms of oral misoprostol, or twenty-five micrograms of vaginal misoprostol was given every four hours. If cervical ripening (Bishop score ≥ 8 or cervical dilatation ≥ 3) or active labor did not occur, repeated doses were given to a maximum of six doses or 24 hours. Thereafter, oxytocin was administered intravenously as a standardized incremental infusion protocol to a maximum of 22 μU/min.

RESULTS: Forty-eight subjects (21.9%) completed cervical ripening with oral misoprostol and 110 (50.0%) with vaginal misoprostol. Fewer subjects who received oral misoprostol (52/110, or 47.3%) compared to those who received vaginal misoprostol (52/110, or 47.3%) 'between the two groups.

CONCLUSIONS: Oral administration of 50 microgram doses of misoprostol appears less effective than vaginal administration of 25 microgram doses. Further investigation is needed to determine which misoprostol should be used for cervical ripening and labor induction. The incidence of side effects was similar between the two groups of administration. Further investigation is needed to determine whether oral misoprostol should be used for cervical ripening and labor induction.

PREINDUCTION CHARACTERISTICS DO NOT PREDICT CESAREAN DELIVERY IN WOMEN UNDERGOING LABOR INDUCTION WITH AN UNFAVORABLE CERVIX

OBJECTIVE: In order to identify women with an unfavorable cervix in whom induction of labor would likely be unsuccessful, we sought to determine if one or more objective preinduction characteristics could have clinically significant predictive accuracy for cesarean delivery (CD).

STUDY DESIGN: Data collected in two randomized trials of labor induction independently conducted at two University hospitals were analyzed. Entry criteria and ancillary treatments were similar in both trials. The first trial (UAB) compared extramammary saline infusion (EASI) + oxytocin (oxy) (n = 162), laminaria + oxy (n = 167), and serial doses of Prepidil™ (n = 112). The second trial (UIC) compared EASI + oxy (n = 119) and vaginal misoprostol (n = 121). To determine which characteristics predicted CD, we utilized a stepwise multiple logistic model. We required that the best model have a specificity (SPEC) of at least 70% for CD in order to be clinically useful. The model was developed using the UAB data (n = 451) and then tested on the UIC data (N = 250).

RESULTS: The overall CD rates in these trials were 25% and 22%. Both had been designed with statistical power to demonstrate a clinically significant reduction in CD rates, and neither trial demonstrated superiority of any of the induction methods in reducing CD. The following variables at UAB were significantly associated with CD in a univariate analysis (p < 0.05): gestational age, abnormal anteprtum testing (APTT, p < 0.05); postterm pregnancy, alcohol (p < 0.05); and initial dilation (DIL) and effacement (EFF). Odds ratios and 95% confidence limits for the best model included: EFS ≥ 3750 g, 2.0 (1.2-3.4), ABTEST, 2.0 (1.1-3.5), and EFS >7 cm, 0.5 (0.0, 0.8). Using a minimum SPEC of 70%, the observed model specificity (SENS) at UAB was only 51%. When the same model and SPEC constraints were applied to the UIC data, the SPEC was 78%, however the SENS was only 31%. Even in the worst case scenario (DIL=0, cm and ABTEST and EFS=3750 grams) the CD rate was only 40%.

CONCLUSIONS: Our best model with a SPEC of at least 70% identified at most one half of the women who would ultimately undergo CD. This suggests that all women with an unfavorable cervix should be given the benefit of a trial of labor since no combination of preinduction factors sufficiently predicted CD.

CERVICAL RIGIDITY AT LABOR INDUCTION WITH ORAL MISOPROSTOL: A RANDOMIZED CONTROLLED TRIAL

OBJECTIVE: In order to identify women with an unfavorable cervix in whom induction of labor would likely be unsuccessful, we sought to determine if one or more objective preinduction characteristics could have clinically significant predictive accuracy for cesarean delivery (CD).

STUDY DESIGN: Data collected in two randomized trials of labor induction independently conducted at two University hospitals were analyzed. Entry criteria and ancillary treatments were similar in both trials. The first trial (UAB) compared extramammary saline infusion (EASI) + oxytocin (oxy) (n = 162), laminaria + oxy (n = 167), and serial doses of Prepidil™ (PREP, 1 applicator every 6 hours x 2 doses). The second trial (UIC) compared EASI + oxy and vaginal misoprostol (MISO, 50 μg every 4 x 25 μg). Vaginal examinations were performed when the ripening agent was injected (time 0), at 44 hours (time 1 - 6 hours in the UAB trial and 3 hours in the UIC trial), and at 12 hours (time 2), if undelivered. Cervical change was defined as an increase of 2 cm dilation or ≥ 25% effacement.

The positive predictive values (PPV) values for CD were calculated.

CONCLUSIONS: The overall CD rates in these trials were 25% and 22%. Both had been designed with statistical power to demonstrate a clinically significant reduction in CD rates, and neither trial demonstrated superiority of any of the induction methods in reducing CD. The number of women who did not change their cervixes and ultimately underwent CD and the PPV are presented below at time 1 and time 2.

### RESULTS

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438 REDUCTION-OXIDATION STATE (REDOX) REGULATION OF MATRIX METALLOPROTEASE ACTIVITY IN HUMAN FETAL MEMBRANES. J.A. Buhimschi*, W.B. Kramer, C.S. Buhimschi*, L.P. Thompson*, C.P. Weiner. Dept of OB/GYN, Univ of Maryland School of Medicine, Baltimore, MD.

The mechanisms underlying membrane rupture at term and preterm (PPROM) are still obscure. Collagenolytic activity of matrix metalloproteinases (MMPs) in amniochorionic membranes increases during spontaneous term and preterm labor associated with intraamniotic infection.

OBJECTIVE: To test the hypothesis that redox homeostasis, which is altered in inflammatory states, directly regulates amniochorionic MMP activity.

STUDY DESIGN: Membranes were collected from 7 patients undergoing elective section at term, rinsed thoroughly and immediately incubated in PBS at 37 C for 24h. MMP activity in the culture medium was assayed by zymography and normalized against the dry weight of the tissue incubated. Supernatant 20000xG (Ox) were generated in the presence of membranes by a xanthine (X: 2mM), xanthine oxidase (XO: 20uM/ml) mixture and monitored by reduction of ferri- ferro-cytochrome c. Superoxide dismutase (SOD: 500U/ml), N-acetyl cysteine (NAC: 10mM) were used as inhibitors of Ox. Intracellular generation of Ox was monitored by the reduction of nitroblue tetrazolium to formazan.

RESULTS: Basal MMPs and MMP2 activities were detected in all tissues. Ox induced a significant increase in MMP9 activity that was reversed by addition of SOD. NAC reduced both MMP9 and MMP2 basal activities to 20% of untreated control (CRL). Importantly, NAC completely inhibited intracellular formazan formation in cultured membranes.

CONCLUSION: MMP activity in human fetal membranes is redox regulated. Ox, a byproduct of macrophages and neutrophils, may directly induce MMP9 activity. Thus, thiols reducing agents such as NAC may be beneficial in preventing PPROM and preterm labor associated with intraamniotic infection.

439 A COMPARISON OF ORAL AND VAGINAL MISOPROSTOL FOR IN-VAGINALLY every 6 hours until the cervix was favourable for amniotomy, V.P. Mackenziex, in intraamniotic infection. specific labour were randomized to receive 50 micrograms of misoprostol orally or beneficial in preventing PPROM and preterm labor associated with intracellular formazan formation in cultured membranes.

441 THE EFFECT OF OBSTETRIC INTERVENTIONS ON LABOR CURVES OF NULLIPARA, MULTIPARA AND GRANDMULTIPARA: E Gurewich, W.B. Kramer, F Chervenak, New York Hospital-Cornell Medical Center, New York, NY

OBJECTIVE: To compare labor curves of grandmultipara (para ≥ 5) and low-parity multipara (P1-4) and assess the validity of a novel power-law model for labor progress.

STUDY DESIGN: A retrospective cohort of all spontaneously-laboring, vertex-presenting, term GM admitted from 1/90-6/95 lacking uterine scars or contraindications to labor were randomly computer-matched to a P0 and a P1-4 control, each meeting the same criteria and matched for age and year of delivery. Cervical exam data culled from medical records were least-squares fitted to a novel model model D=10 [S/(T-t)]N accommodate a variety of shapes of labor curves; N relates to the average slope (transition from latent to active phase), N/S is the slope at the end of the active phase, N/S is the slope at the end of the active phase. T merely fixes the time of origin. Mean N and S were compared between groups by ANCOVA, controlling for obstetric interventions. Bonferroni-adjusted, pairwise multiple comparisons and multiple regression with ungrouped parity, were also performed.

RESULTS: The labor curve model was fitted to all 1077 patients with 23 exams (338 GM, 384 P0, 355 P1-4) with an r2 > .70 in 90% of cases, validating the model. Mean values of N and S were significantly different between parity groups, regardless of intervention (P<0.0001). P0's differed significantly from P1-4's and GM's (each P<0.0001) for both N and S, whereas P1-4's and GM's were marginally significantly different (P=0.050) for N, but did not differ for S (P=0.1758). Multiple regression revealed a significant U-shape (parabolic) effect (P<0.0001) for both N and S w parity, with greater values of N and S at the extremes of parity, and the nadir at parity between 6 and 7.

CONCLUSIONS: As expected, labor curves of P0's differ from those of P1-4's and GM's; those for GM's and P1-4's differ only marginally, perhaps because parities 5 and 6 were grouped with GM's. With high parity (≥7), labor curves of GM's regress away from those of P1-4's toward those of P0's. The model labor curve may be deemed valid.
442 THE UTILITY OF METOPROLOL IN DYSFUNCTIONAL LABOR

Barrilleaux P5, Adair CD, Lewis DF, Garrilla D4, Weeks J, Wise R5, Philibert L
LSUMC-Shreveport, Department of Ob/Gyn

OBJECTIVE: The purpose of this ongoing study was to determine if metoprolol in conjunction with continuous infusion oxytocin could reduce the cesarean section rate.

METHODS: 40 consenting patients with abnormalities of the active phase of labor were randomly assigned in blinded fashion to one of two groups: 1) Five milligrams of intravenous metoprolol or 2) An equivalent volume of normal saline. Both groups were maintained on continuous infusion oxytocin. Patients with no response one-hour after a dose of saline or metoprolol received a second dose of the same solution. Those with no cervical change two hours after the first dose were delivered by cesarean section. A 50% reduction in the cesarean section rate was the goal of the study. Power calculations suggested the need to enroll a total of 120 patients in order to test our main outcome variable (alpha = .05, beta = .20 power). Statistical analysis included Chi square analysis and the Student t test.

RESULTS: There were no differences of labor methods (i.e. Induction vs. spontaneous), cervical exam at admission or arrest, length of labor, time of oxytocin, or number of doses of metoprolol or placebo. There were no differences of outcome between the two groups. There were fifteen (60%) cesarean sections in the metoprolol group and fourteen (56%) in the placebo arm. There were 10 (40%) vaginal deliveries of the metoprolol group and 11 (44%) in the placebo group. There were no differences of birthweight, APGAR scores, or NICU admissions.

CONCLUSION: The use of non-hypotensive doses of intravenous metoprolol in patients with dysfunctional labor with concomitant continuous oxytocin may possibly be used safely. However, thus far, it does not appear to reduce the need for cesarean section.

444 APOPTOSIS IN CHORION LAVEE OF FETAL MEMBRANES WITH SPONTANEOUS RUPTURE OF MEMBRANES AT TERM. AP Martha, WN Herbert, Duke University Medical Center, Durham, NC

OBJECTIVE: We previously reported (IDSOG, 1998) that apoptosis is accelerated in term patients with histologic chorioamnionitis. As inflammation is thought to be associated with rupture of membranes, we sought to determine if apoptosis is accelerated in the chorionic lavee of term patients with spontaneous rupture of membranes (SROM) when compared to those with artificial rupture of membranes (AROM).

STUDY DESIGN: Formalin fixed, paraffin embedded fetal membrane rolls from 34 term pregnancies were examined for evidence of apoptosis using the Apoptag Plus kit ( Oncor, Gaithersburg, MD). Samples were stained using the TUNEL method and apoptosis quantified by counting the number of apoptotic nuclei in the chorion lavee relative to the number of normal nuclei in 7 random high-powered fields. Samples were excluded if there were pre-existing medical conditions or obstetric complications. Data were analyzed by Mann Whitney U test, with significance defined as P<.05.

RESULTS: There was no significant difference in maternal age, race, insurance status, histologic chorioamnionitis, length of labor, spontaneous labor or cesarean delivery rate between the two groups. Fetal membrane samples from patients with SROM had a similar proportion of apoptotic nuclei when compared to those with AROM.

445 FETAL PLASMA INTERLEUKIN 6 LEVELS ARE ELEVATED IN PREGNANCIES DELIVERED AFTER THE ONSET OF LABOR. A. Jazayeri, J. Tuhorisz, W. Spellacy, Dept. of Ob/Gyn, LSUMC, Shreveport and Univ. of South Florida, Tampa.

OBJECTIVE: To determine if fetal umbilical plasma interleukin 6 (IL-6) levels were different in neonates delivered after the onset of labor compared to those delivered by elective cesarean sections.

STUDY DESIGN: One hundred and sixty samples were analyzed during 1995-97. Cord blood was needle aspirated and spun to separate the plasma, which was then frozen until analysis. Samples collected from patients prior to onset of labor were marked prospectively: IL-6 levels (pg/mL) were measured using an ELISA kit from R&D Systems (Minneapolis, MN). Statistical analyses were done by independent t-test and ANOVA for multiple comparisons using the SPSS statistical package. Probability values less than 0.05 were considered significant.

RESULTS: Fetal plasma IL-6 levels (mean ± SEM) were elevated in those neonates delivered after the onset of labor (21.7 ± 2.7, n=136) compared to elective cesareans (5.9 ± 1, n=25, p<0.001). After review of the medical records, patients with neonatal infections, clinical or pathological chorioamnionitis were identified. The mean IL-6 levels were not different in these neonates (24.0 ± 7.1, n=25) compared to neonates with no documented infections (18.4 ± 2.4, n=136, p=NS). When this group of neonates was divided into subgroups, there was no difference between clinical chorioamnionitis (24.2 ± 9.8, n=12), placenta chorioamnionitis (23.2 ± 11.1, n=9), or neonatal infection (25.2 ± 9.7, n=4). In the labor group, there were 21 neonates with some documented infection, as described above. The fetal IL-6 was not different in these neonates (27.2 ± 5.3) compared to the rest (20.8 ± 2.8).

CONCLUSIONS: Labor is associated with elevated fetal IL-6 levels. Elevated fetal IL-6 in patients in preterm labor may be an indicator of the presence of active labor leading to imminent delivery rather than infection.

OBJECTIVE: Human labor may be modified by inflammatory cells and their cytokines. We investigated myometrium for the presence of inflammatory cells. We determined whether inflammation was associated with the duration of labor, signs of infection, or the invasion of cytotrophoblasts (cTBS) into the myometrium.

STUDY DESIGN: Using IRB guidelines, postpartum biopsies of myometrium were taken from 52 women having C-sections. Without knowledge of clinical findings, a histopathologist reviewed the biopsies.

RESULTS: Of the 52 women, 35 (67%) had no labor 5 had >24 hours. Mean inflammation score was 2.2. Myometrial cTBS were identified. Independently, charts were reviewed for the admitting diagnosis, conditions and duration of labor, and signs of infection.

CONCLUSIONS: More women in labor for >24 hours had acute and chronic myometritis. The myometrial inflammatory cells may release cytokines which stimulate myometrial contractions. Lymphocytes were found associated with the invading cTBS; these cells may have a role in limiting the depth of cTBS invasion.


OBJECTIVE: Nulliparous women who present in active labor at term with an unengaged fetal head are generally considered at risk for dystocia. However, the prognostic significance of the unengaged fetal head for abnormal labor progress, cesarean and instrumental delivery, and neonatal outcome has not been quantitatively determined. The purpose of this study was to provide a quantitative assessment of adverse outcome risk associated with the unengaged fetal head.

STUDY DESIGN: Clinical outcomes of 349 nulliparous women at term were examined. AJ1 patients were evaluated in active labor (n=1123), term labor >24 hours (n=3292-1400 gms; p<0.007) and 1 min and 5 min Apgar scores lower (p<0.001) in this group.

RESULTS: Cesarean section rates were significantly higher in the study group compared to controls (17.6% vs 4.1%; p<0.0001). When maternal height and gestational age were controlled, 3.72 fold relative risk for abdominal delivery was found. When the fetal head remained unengagement at 7 cm cervical dilatation, 100% of cases (n=67) required cesarean section for delivery. The rate of instrumental deliveries was similar in both groups (p<0.05) Birthweights were higher (3420/396 vs 3292/1400 gms; p<0.0007) and 1 min and 5 min Apgar scores lower (p<0.001) in this group.

CONCLUSIONS: 1. Lack of fetal head engagement in laboring nulliparous women confers a substantially increased risk for abdominal delivery and prolonged second stage of labor.


OBJECTIVE: To examine the effect of pitocin use for induction or augmentation and the effect of prostaglandin E2 gel (PGE2) on the rate of uterine rupture in gravidas with one prior cesarean section and no other previous deliveries.

STUDY DESIGN: The medical records of all the women in the hospital with a history of one prior cesarean section and no other deliveries who attempted a trial of labor during a 12 year period at a single center were reviewed.

RESULTS: Of 5774 women in the analysis, 925 were induced with pitocin and 1089 were augmented with pitocin and 1160 received no pitocin. One hundred two women received PGE2 gel. The rate of rupture was 2.8% among those induced with pitocin, 1.6% among those augmented with pitocin and 0.5% among laboring women not receiving pitocin. The rate of rupture among women receiving PGE2 gel was 3.9%. Controlling for birthweight, use of epidural, length of labor, maternal age, year of delivery and years since last birth in a logistic regression analysis demonstrated a 4.5 fold increased risk of uterine rupture during induction with pitocin compared to women receiving no pitocin (95% CI = 1.5 - 14.1). In the model, augmentation with pitocin was associated with an OR = 2.3 (95% CI = 1.5 - 2.6) and use of gel was associated with OR = 3.2 (95% CI = 0.9 - 10.9).

CONCLUSION: Induction of labor with pitocin was associated with more than a four-fold increased risk of uterine rupture among women with an a priori cesarean and no other deliveries. While not statistically significant, our data suggest that use of gel may be associated with some increase in the risk of uterine rupture.

449 EFFECT OF PRIOR CESAREAN INDICATION ON DURATION OF LABOR AND CESAREAN RISK DURING A TRIAL OF LABOR. T. Ship3, C. Zelop4, A. Gaughtex, A. Cohen, E. Liebermanx, Dept. Ob/Gyn, Harvard Medical School, Massachusetts General Hospital, Brigham and Women’s Hospital, Boston, MA.

OBJECTIVE: To determine whether the risk of cesarean for women undergoing a trial of labor with only one prior cesarean is different from that of nulliparas, and whether the rates of cesarean and lengths of labor for women with only one prior cesarean vary according to prior indication for cesarean.

STUDY DESIGN: The medical records for women undergoing a trial of labor after prior cesarean over a 12 year period (7/84-6/96), as well as those of all nulliparas delivering over a 9 month period (12/94/8/95) at a tertiary care hospital were reviewed. The rate of cesarean for nulliparas was compared to that of women with a prior cesarean. For those gravida with a prior cesarean, the rates of repeat cesarean were compared by prior indication: breech, failure to progress (FTP), non-reassuring fetal testing (NRFT) or other/unknown (O/U).

RESULTS: The rate of cesarean was 684/2907 (23.7%) for the prior cesarean group and 215/1617 (13.5%) for the nulliparous group. P<0.001.

CONCLUSION: There is a significantly higher rate of cesarean for gravidas with only one prior cesarean undergoing a trial of labor compared to nulliparas, and this is related to the indication for the prior cesarean and is highest for those women whose prior cesarean was for FTP.

LENGTHS OF LABOR FOR GRAVIDAS WHOSE PRIOR CESAREAN WAS FOR FTP. 15.1 hours for the breech, FTP, NRFT, and O/U subgroups, respectively.

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For those gravidas having a cesarean for FTP in the index pregnancy, the mean duration of labor in the index pregnancy was 13.9, 11.3, 13.4 and 15.1 hours for the breech, FTP, NRFT, and O/U subgroups, respectively.

CONCLUSIONS: There is a significantly higher rate of cesarean for gravidas with only one prior cesarean undergoing a trial of labor compared to nulliparas, and this is related to the indication for the prior cesarean and is highest for those women whose prior cesarean was for FTP.

OBJECTIVES: To evaluate the inter-relationship between the presence of a cystic teratoma in the ovary and the outcome of pregnancy and labor in women with an ultrasonographically diagnosed ovarian cystic teratoma.

METHODS: Forty-nine women with ultrasonographically diagnosed ovarian cystic teratomas smaller than 6 cm were followed. The risk factors for sphincter tears were analyzed. The association was assessed with univariate and multivariate logistic regression analysis.

RESULTS: Anal sphincter tears occurred in 95/2883 women (3.3%). The rate of rolling for delivery remained as significant risk factors. The risk of sphincter tear was compared with the group devoid of such injury. Of the 68 pregnancies 5 ended in miscarriages, and in 63 pregnancies, 64 healthy children were delivered. Five patients needed treatment by assisted reproduction techniques. Fifty-five pregnancies ended in normal vaginal deliveries and 8 delivered by cesarean section (cesarean section rate of 12%). In none of the women in the follow up group (mean age 30 years) did classical complications attributed to dermoid cysts such as torsion, dystocia and rupture occurred. There was a follow up of 40 dermoid cysts throughout pregnancy, and in 15 of these, the cyst size was unchanged.

CONCLUSIONS: Ovarian dermoid cyst smaller than 6 cm in size can be conservatively followed throughout pregnancy and labor. There is no change in the size of the teratoma during pregnancy.

452 BIRTHWEIGHT OVER 4000 GRAMS: IS INDUCTION OF LABOR ASSOCIATED WITH A HIGHER CESAREAN SECTION RATE COMPARED TO SPONTANEOUS LABOR. H. Sadeyh, C. Trimarchi, T. A. Dinh, T. Tener, T. Westover, RL Fischer. Dept OB/GYN. Cooper Hospital/University Medical Center. Camden, New Jersey.

OBJECTIVE: Our purpose was to determine if a cesarean delivery (CD) rate for newborns weighing over 4000 gms was greater in those that underwent induction of labor (IOL) versus those that presented in spontaneous labor (SL).

STUDY DESIGN: We retrospectively identified all singleton, non-anomalous, cephalic newborns weighing over 4000 gms delivered between 1/1/95 and 12/31/97. Medical records were reviewed and patients classified into two groups: those that presented in SL versus IOL. The primary outcome evaluated was the CD rate for both groups. Statistical analysis included Chi-square and Student’s T-test where appropriate.

RESULTS: We identified 284 newborns weighing greater than 4000 gms. 178 had presented in SL and 106 underwent IOL (of which 20% were for macrosomia). There was no difference between the groups with respect to maternal age, parity, or prior history of CD.

SL (N=178) IOL (N=106) p value

| BW (gms)         | 4215 ± 206 | 4253 ± 237 | .16 |
| BW > 4000 gms    | 16 (9.5%)  | 19 (17.1%) | .05 |
| Cesarean Delivery| 45 (26%)   | 29 (26%)   | .98 |
| Shoulder Dystocia | 13 (10.2%) | 13 (15.6%) | .23 |

The need for CD due to arrest disorders was not significantly different between the groups. Even after controlling for prior CD, gestational diabetes, and gestational age, the rate of CD was not statistically different.

CONCLUSION: Induction of labor versus onset of spontaneous labor in gravidas with a macrosomic fetus was not associated with an increase in the rate of cesarean delivery.


OBJECTIVE: To determine if ethanol induced hormonal changes reduce nutrient transport to the fetus contributing to intrauterine growth retardation (IUGR). In these studies, we have investigated the effect of acute ethanol on thromboxane and prostacyclin production on both the maternal and fetal sides of the human placenta.

STUDY DESIGN: Term placentas were dually perfused from the maternal and fetal circulation with DMEM. Other term placentas were perfused with the DMEM for 30 min, then with medium supplemented with ethanol - 200 mg/kg for 90 min, followed by a recovery period of 60 min; then acetyl salicylic acid (ASA) (3.64 mg/ml) was added to the medium for 60 min. Thromboxane B2 (TXB2) and prostacyclin (PGF 1α) were quantified by RIA in the effluent fetal and maternal media every 10 min.

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454 DILEMMA OF THE VERTEX/NON-VERTEX TWIN SM Paul, M.D. and CA Major, M.D., Dept. of OB/GYN, University of California, Irvine Medical Center, Orange, Calif. 

OBJECTIVE: To determine the optimal mode of delivery of the second non-vertex (non-vtx) twin, especially, when the birthweight (BW) of Twin B>Twins. 

STUDY DESIGN: A retrospective cohort study of the management and outcome of 600 twin deliveries at our institution between 1985 and 1996. One hundred thirty-two sets of twin onvertex (non-vtx) twins were eligible for the study and were divided into 3 groups based on the mode of delivery of the second non-vtx twin. Group 1 (n=70) consisted of all patients who underwent a primary attempt at vaginal breech extraction (VBE) of the second twin. Group 2 (n=25) included all patients who had a primary attempt at external version (EV) of the second twin and group 3 (n=48) was made up of patients who underwent an elective cesarean section (C/S) for twins. Each group was then further subdivided into subgroups in which the BW of Twin B>Twins in the VBE group. Maternal demographics, morbidity, and neonatal morbidity (birth trauma, 5-min Apgar, cord gases) were compared among the groups and subgroups. Vaginal delivery success rates between the VBE and EV groups, and their respective subgroups, were also compared. Statistical analysis included Chi Square test, Fisher exact test, and Student t-test. 

RESULTS: The demographics among the 3 groups were similar. The incidence of postpartum hemorrhage was significantly higher in patients in the EV group when compared to the VBE and EV groups (29% vs 6% and 12.5%; p<0.05). The postpartum hospital stay was longer in the C/S group than in the VBE and EV groups (4.9 days vs 2.5 and 3.2 days; p<0.05). Neonatal hospital stay and neonatal morbidity were similar among the 3 groups, even when the BW of Twin B>Twins. Success in achieving a vaginal delivery of a 2nd non-vtx twin was greater in the VBE group than in the EV group (65% vs 57%; p<0.05). However, when the BW of Twin B>Twins, there was a 3.5 fold decrease in the vaginal delivery success rate in the VBE group and no difference in the success rate in the EV group. 

CONCLUSIONS: Vaginal delivery of the non-vtx twin is associated with a higher risk of success rate than EV only when the BW of Twin A>B. Furthermore, VBE is associated with less maternal morbidity than EV. Finally, neonatal morbidity was similar, regardless of the mode of delivery of the 2nd non-vtx twin.

455 THE ROLE OF NITRIC OXIDE AND RELAXIN IN CERVICAL RIPENING. L. Shih, S-Q. Shi, G. Saade, K. Chwalisz, O.D. Sherwood, R.E. Garfield, Dept. of Ob/Gyn, The Univ of Texas Med. Branch, Galveston, TX and Research Laboratory Schering AG, Germany and Dept. of Molec. and Integ. Physiol. Univ. of Illinois, Urbana, IL. 

OBJECTIVE: Relaxin (RLX) has been implicated in the remodeling of the extracellular matrix of the cervix during the latter stages of pregnancy and the role of nitric oxide (NO) may also be involved. Our objective was to determine if RLX promotes cervical ripening in pregnant rats and whether its effect is NO dependent. 

STUDY DESIGN: Timed-pregnant Sprague-Dawley rats were sacrificed on gestational day 17 after 3 days treatment with vehicle or relaxin (50 mg/day/rat via osmotic minipumps) alone or with either one of the nitric oxide synthase inhibitors L-Nr-1-Iminoethyl-lysine (L-NIL, 1~ng/day/rat) or L-nitro-arginine-methylester (L-NAME, 50 mg/day/rat) via osmotic minipumps) alone or with either one of the nitric oxide synthase inhibitors L-Nr-1-Iminoethyl-lysine (L-NIL, 1~ng/day/rat) or L-nitro-arginine-methylester (L-NAME, 50 mg/day/rat). The cervix was isolated from each animal and suspended between two hooks in organ baths containing physiologic solution. The hooks were connected to a cervimeter that precisely stretched the cervical tissues in incremental steps with 5% CO2 in air (t=37°c, 30 min), indomethacin (10-5 M) or superoxide dismutase (30 U/ml) to prevent endogenous release of prostaglandins or free radicals and to remove reactive oxygen species, respectively. The change in vascular tone in response to the agents tested was recorded in order to detect the release of inhibitory factor(s), either basal or after treatment of the donor horn with the agents known to release endothelial-derived relaxing factor (EDRF). The agents tested were acetylcholine, bradykinin, substance P, calcium ionophore A 23187, thombin, adenosine, adenosine diphosphate, adenosine triphosphate (1~5 each). The agents were perfused into the donor uterine horn for 54 min using a syringe pump (final concentration 10-5 M to 10-5 M). 

RESULTS: There was no basal release of inhibitory factor(s) and none of the agents tested induced significant change in the tension of the cervix (R+L). Rings of rat aorta from which the endothelium was mechanically removed were contracted with 10-5 M phenylephrine and used as a control. The detector vessel was placed under the con traction. The change in vascular tone in response to the tension was recorded in order to detect the release of inhibitory factor(s), either basal or after treatment of the donor horn with the agents known to release endothelial-derived relaxing factor (EDRF). The agents tested were acetylcholine, bradykinin, substance P, calcium ionophore A 23187, thrombin, adenosine, adenosine diphosphate, adenosine triphosphate (1~5 each). The agents were perfused into the donor uterine horn for 54 min using a syringe pump (final concentration 10-5 M to 10-5 M). The increase in bAR-mRNA levels increased at 8 hours and returned to control levels at 24 hours (Fig 2). 

CONCLUSIONS: Our findings do not support a role for decreased bAR expression in the onset of labor. The increase in bAR-mRNA associated with term and preterm labor may represent a negative feed-back response.
459 EFFECT OF MAST CELL MEDIATORS ON ISOLATED NONPREGNANT AND PREGNANT GUINEA PIG UTERUS. E. Bytautas1, Y. Vedernikov3, M. Ait1, G. Saade, R. Romero, R.E. Garfield2. Dept of Ob/Gyn, The Univ of Texas Med. Branch, Galveston, TX.

OBJECTIVE: Labor has been likened to a type I immune response. Our objective was to identify mast cell (MC) mediators that may influence uterine contractility during pregnancy. Our findings support the hypothesis that immunologic mediators may influence labor, especially from term.

STUDY DESIGN: Longitudinal uterine strips (1 cm x 3-4 mm) from sexually mature nonpregnant and pregnant (day 40 and 60) guinea pigs were isolated and mounted in 10 ml organ chambers filled with Kreb’s buffer aerated with 5% CO2 in air (37°C, pH 7.4) for recording of uterine contractions.

To study the effect of endogenous MC, cumulative concentrations of the degranulating agent compound 48/80 (0.5, 5, 50 μg/ml) were added to the chambers at time 0. To define the effect of exogenous MC, an established cell line (MC/9; 10^5 cells/ml) were used. Cells or their supernatant were added to the chambers either directly or after activation with 48/80. The strips were then washed and re-equilibrated for 1 hour before a KCl (60 mM) reference contraction was obtained to define basal contractility. The strips were then washed and re-equilibrated for 1 hour before a KCl (60 mM) reference contraction was obtained to define basal contractility. The strips were then washed and re-equilibrated for 1 hour before a KCl (60 mM) reference contraction was obtained to define basal contractility. The strips were then washed and re-equilibrated for 1 hour before a KCl (60 mM) reference contraction was obtained to define basal contractility. The strips were then washed and re-equilibrated for 1 hour before a KCl (60 mM) reference contraction was obtained to define basal contractility.

RESULTS: Compound 48/80 had minimal direct effect on uterine contractility. Exogenous MC increased contractility in a dose-dependent manner as compared to controls. The effect was even higher after incubation of MC with compound 48/80 (Fig 1). The effects of MC and supernatant were decreased close to term.

CONCLUSIONS: MCs are capable of modulating uterine contractility in a gestationally dependent manner. Our findings support the hypothesis that immunologic mediators may influence labor, especially from term.

460 CALDESMON, A PUTATIVE INHIBITOR OF SMOOTH MUSCLE CONTRACTION, IS GREATLY INCREASED IN PREGNANT HUMAN MYOMETRIUM. R. Laporte1,2,3, B.F. Cohen1,2, S.F. Herzlinger2,3, D.R. Ansley1, C-L.A. Wang3, J. Ludmir1,2, K.G. Morgan1,2,3, G. Alvarez1,2. Beth Israel Deaconess Med. Center1, Harvard Med. School2, and Boston Biomedical Research Institute3, Boston, MA.

OBJECTIVE: The smooth muscle protein caldesmon inhibits myosin force production. Given the relative quiescence of human myometrium during pregnancy compared to the non-pregnant state, we hypothesized that caldesmon content is increased in pregnant myometrium.

STUDY DESIGN: Four myometrial biopsies were obtained from the lower uterine segment of non-laboring pregnant women at the time of c-section (age: 34 to 37 yr., parity: 0 to 3, estimated gestational age: 27 to 32 wk.) and five were obtained after hysterectomy of non-pregnant premenopausal women (age: 40 to 46 yr., parity: 1 to 4, indications: 2 fibroids, 1 endometriosis, 1 menorrhagia, 1 leiomyomata). Caldesmon and myosin were measured by quantitative Western blot analysis following extraction with SM urea and 2% sodium dodecyl sulfate. Since myosin interacts with caldesmon and myosin content is reported to be unchanged in pregnant myometrium, caldesmon content was expressed as the ratio of caldesmon to myosin.

RESULTS: Caldesmon/myosin ratio in pregnant myometrium (0.58 ± 0.10, range: 0.45-0.87) was significantly different from that in non-pregnant myometrium (0.13 ± 0.01, range: 0.10-0.15, P = 0.019). In contrast, myosin content was not significantly different (P = 0.70). No significant correlation was found between caldesmon/myosin ratio and the estimated gestational age in the range studied (r2=0.30).

CONCLUSIONS: Caldesmon content is greatly increased in pregnant as compared to non-pregnant myometrium. Studies are now underway to determine the role of caldesmon in the initiation of term and preterm labor.

461 EFFECT OF NITRIC OXIDE AND CARBON MONOXIDE ON RAT UTERINE CONTRACTILITY DURING PREGNANCY. M. Longo1, Y. Junt2,3, Y. Vedernikov3, G. Saade, R. Chwalisz1, F. Facchinetti1, R. Garfield2. Dept. of Ob/Gyn, The Univ. of Texas Med. Branch, Galveston, TX, Schering AG, Berlin, Germany and Dept. of Ob/Gyn, Univ. of Modena, Italy.

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CONCLUSIONS: Caldesmon content is greatly increased in pregnant as compared to non-pregnant myometrium. Studies are now underway to determine the role of caldesmon in the initiation of term and preterm labor.

REFERENCES: (Fig 1)
462 EFFECT OF NITRIC OXIDE AND CARBON MONOXIDE ON HUMAN MYOMETRIUM CONTRACTILITY AT TERM. M. Longo, V. Jain, V. Vedernikov, G. Saade, K. Chwalisz, F. Facchinetti, R. Garfield, Dept. of Ob/Gyn, The Univ. of Texas Med. Branch, Galveston, TX and Schering AG, Berlin, Germany. Depts of Ob/Gyn, Univ. of Modena, Italy.

OBJECTIVE: Previous studies showing that nitric oxide (NO) plays a role in uterine contractility were based mainly on the effects of NO donors and inhibitors rather than on direct effects. Like NO, carbon monoxide (CO) also acts on cGMP to cause relaxation of vascular smooth muscle. Our objective was to study the direct effects of NO and CO gas on uterine contractility in the pregnant human.

STUDY DESIGN: Uterine strips were prepared from biopsies specimens obtained from 10 women undergoing scheduled elective cesarean section at term (gestational age: 38-42 weeks). The preparations were mounted for isometric tension recording in 10 ml organ chambers filled with Krebs' solution aerated continuously with 5% CO2 in air (37°C; pH = 7.4). The effects of saturated solutions of NO (1.67x10^-7 to 1.67x10^-2 M) and CO (5.5x10^-5 to 1x10^-2 M) on spontaneous contractile activity were studied. In addition, responses to endogenous production of CO induced with heme (hemoxygenase substrate, 10^-6 M) were examined.

RESULTS: NO and CO inhibited spontaneous uterine contractility (Fig). CO had no significant direct effect on uterine contractility.

CONCLUSIONS: NO gas and hemoxygenase substrates, but not CO gas, inhibit uterine contractility in humans. Unlike the rat and guinea pig uterus, the human uterus is not refractory to the effect of NO at term. Since NO also acts on the cGMP system, our results suggest that the effect of NO may be independent of cGMP. NO donors and hemoxygenase substrates may be useful in the management of preterm labor.

463 EFFECT OF FLUOXETINE ON CONTRACTILE ACTIVITY OF RAT UTERINE RINGS. S. Belamai, V. Vedernikov, E. Bytauiene, E. Fulep, G. Saade, R. Garfield, Dept. of Ob/Gyn, The Univ. of Texas Med. Branch, Galveston, TX.

OBJECTIVE: Pregnant women receiving fluoxetine have a higher incidence of preterm delivery. Our aim was to determine the in vitro effect of fluoxetine on spontaneous and serotonin-induced contractile activity of the isolated uterus from rats at mid and late gestation, and to compare this effect to those of imipramine (inhibitor of serotonin and norepinephrine uptake) and nortriptyline (inhibitor of norepinephrine uptake).

STUDY DESIGN: Isolated uterine rings from timed-pregnant Sprague-Dawley rats on days 14 (mid) and 22 (term) of gestation were used. The preparations were mounted for isometric tension recording. Responses to cumulative concentrations of fluoxetine (10^-10 to 10^-5 M), serotonin (10^-10 to 10^-5 M) and the respective antidepressants tested had a significant effect on spontaneous contractile activity of isolated uterine rings from pregnant rats at mid or late (Fig 1) gestation. Preincubation with fluoxetine, imipramine or nortriptyline did not change the sensitivity of the uterine rings to 5-HT but rather attenuated responsiveness in mid (Fig 2) and late pregnancy.

RESULTS: Serotonin increased spontaneous contractile activity of uterine rings at both mid and late gestation. Except for nortriptyline which significantly increased spontaneous contractile activity in late gestation, none of the antidepressants tested had a significant effect on spontaneous contractile activity of isolated uterine rings from pregnant rats at mid or late (Fig 1) gestation. Preincubation with fluoxetine, imipramine, or nortriptyline did not change the sensitivity of the uterine rings to 5-HT but rather attenuated responsiveness in mid (Fig 2) and late pregnancy.

CONCLUSIONS: Our results do not support a role for direct myometrial action in the reported association between fluoxetine and preterm delivery. We cannot, therefore, rule out an indirect effect of fluoxetine on myometrial contractility.


OBJECTIVES: Potassium channel openers are potent inhibitors of uterine contractility. We designed this study to investigate the roles of adenylate and guanylate cyclases in the inhibition of uterine contractility by potassium channel openers in pregnancy.

STUDY DESIGN: Uterine rings from timed-pregnant Sprague-Dawley rats in labor were isolated on days 14 (mid) and 21 (late) of gestation and suspended in organ baths for isometric tension recording. The rings were bathed with Krebs-Henseleit solution and bubbled with 5% CO2 in air (37°C; pH = 7.4). After equilibration in 2 g passive tension, non-control rings were incubated in 50 mM of the adenylate cyclase inhibitor MDL12539 (MDL, 2x10^-5 M) or the guanylate cyclase inhibitor LY83583 (LY, 3x10^-4 M). The effects of cumulative concentrations of NS1619 (NS), a Ca-dependent potassium (Kv) channel opener, and levcromakalim (LCK), an ATP-dependent potassium (KATP) channel opener, on spontaneous contractility were determined in control and pre-intubated rings. Integral contractile activity for 10 min after each concentration was expressed as % change from basal activity.

RESULTS: MDL significantly increased contractile activity of rings from mid-pregnant, but not term or laboring rats, while LY significantly decreased contractility in all groups. Levcromakalim inhibited contractions in all groups equipotently (Fig). MDL decreased the sensitivity and maximal inhibition of contraction induced by levcromakalim, being less potent in the laboring group (Fig ). LY decreased the sensitivity to levromakalim in mid-pregnant animals without influence on maximal inhibition. NS at maximal concentration increased contractility a labor, but inhibited contractility at late and mid gestation (mid > late). MDL abolished the effect of NS in all groups. LY did not significantly influence the response to NS in any of the groups.

CONCLUSIONS: Nucleotide cyclases differentially affect uterine contractility. Potassium channel openers are potent tocolytics (Kv > KATP). Effect of opening of KATP channel on uterine contractility depends on adenylate cyclase, while that of Kv channel depends on both adenylate and guanylate cyclases. Gestational age and labor affect function of KATP but not Kv channels.


OBJECTIVE: To evaluate the role of nitric oxide (NO) in uterine contractility in rats at mid and late gestation in vitro and in vivo.

STUDY DESIGN: Wister rats on days 14 (mid) and 21 (term) of gestation were used. (1) Longitudinal strips were prepared for isometric tension recording and equilibrated at 1 g passive tension in organ chambers filled with Krebs-Ringer solution (37°C; pH = 7.4). The effects of cumulative concentrations of NOS inhibitors (L-NAME; Arg), sodium nitrite (SNP), and LNAME (3 mM) were determined. (2) We opened the abdomen of the rats and fixed a strain gauge on the uterus. We recorded the uterine contraction by Arg (50 mg/kg), SNP (1 mg/kg), and LNAME (50 mg/kg) in anesthetized rats. A cannula was placed in the femoral vein for administration of drugs. Integral contractile activity was calculated and expressed as percent change from basal activity in both experiments.

RESULTS: (1) At midgestation, the strips were inhibited concentration-dependently with Arg and SNP and stimulated by L-NAME. At late gestation, however, contractions were less affected by these drugs. Maximal responses of these three agents were significantly different between mid and late gestation (n = 8; p < 0.05). (2) Arg and SNP significantly inhibited spontaneous uterine contraction at midgestation (81.8±4.8% and 37.6±6.7%, respectively) compared to late gestation (95.6±5.1% and 67.1±3.4%, respectively) (n = 6; p < 0.05). L-NAME significantly increased spontaneous uterine contraction at midgestation (137.7±13.3%) compared to late gestation (0%) (n = 6).

CONCLUSIONS: Through in vitro and in vivo experiments, we demonstrated that an L-Arginine-NO pathway exists in pregnant rat uterus. These studies suggest that NO has an important role in maintaining uterine quiescence at midgestation. NO donors may be useful in preventing preterm birth.

OBJECTIVE: To determine whether uterine EMG activity recorded transabdominally can be used to differentiate between true and false labor.

STUDY DESIGN: Pregnant patients presenting to the labor and delivery area to rule out labor were evaluated. Those in whom the differentiation between true and false labor could not be made clinically with certainty (contractions present but no definitive cervical change) were included (n=20, 27 to 41 weeks gestation). Uterine electrical activity (frequency range 0.5-50 Hz) was recorded for about 30 minutes using bipolar electrodes placed on the maternal surface. The EMG signals were stored and analyzed using a Mac-Lab Recording System and software (AD Instruments, Castle Hill, Australia). The time between recording and delivery was noted. The EMG bursts were analyzed by fast Fourier transform at 1.6 Hz to obtain peak values of power density spectra (PDS) and frequency (Hz). These two variables were then compared between the women who delivered within 24 hours and those who delivered more than 24 hours after the measurements.

RESULTS: EMG activity consisted of well defined bursts corresponding to contractions and separated by quiescent periods. Patients who delivered within 24 hours of recordings had significantly (p<0.004) higher PDS (Fig 1) and frequency of events (Fig 2) within bursts compared to patients who delivered beyond 24 hours.

CONCLUSIONS: Transabdominal recording of uterine EMG activity may aid in the differentiation between patients who will deliver within 24 hours and those who will not. This may assist in the management of patients in whom the diagnosis of true labor is not clear and, otherwise, would have to await cervical change (to admit or not; to use tocolytics and corticosteroids or not).

467 THE EFFECT OF NATRIURETIC PEPTIDES AND NITRIC OXIDE ON SPONTANEOUS UTERINE CONTRACTILITY IN PREGNANT RATS. E. Fulpi*, Y. Vedernikov*, G. Saade, R. Garfield*. Dept. of Ob/Gyn, Univ. of Texas Med. Branch, Galveston, TX.

OBJECTIVE: To compare the roles of soluble guanylate cyclase, stimulated by nitric oxide (NO), and particulate guanylate cyclase, stimulated by natriuretic peptides, on spontaneous uterine contractility in pregnant rats.

STUDY DESIGN: Isolated uterine rings from timed-pregnant Sprague-Dawley rats on day 14 (mid) and 22 (term) of gestation were positioned for isometric tension recording in organ chambers containing Krebs-bicarbonate buffer. The rings were equilibrated at 2 g passive tension until spontaneous contraction stabilized. Responses of uterine rings to cumulative concentrations of atrial natriuretic peptide (ANP), brain natriuretic peptide (BNP), C-type natriuretic peptide (CNP) (10-9-10-6M), and CNP inhibited spontaneous contractions equally at mid and term pregnancy (ANOVA, p<0.004, Fig 1). Inhibition by DE/A/NO was much less pronounced at term. The natriuretic forms were also more potent than NO.

CONCLUSIONS: Stimulation of either soluble or particulate guanylate cyclase inhibits uterine contractions remote from term. Unlike particulate guanylate cyclase, the effect of stimulation of the soluble form is gestational-age dependent and decreases at term. Stimulation of the particulate guanylate cyclase or both phases and particulate may be more effective in inhibiting labor than stimulation of the soluble form alone.

469 ADULT RESPIRATORY DISTRESS SYNDROME IN PREGNANCY: VALIDITY OF THE LUNG INJURY SCORE. K. Stewart*, S. Pradhan*, A. Mason, J.E. Whitty. Dept. OB/GYN, Hutzel Hospital, Wayne State University, Detroit, MI.

OBJECTIVE: The Lung Injury Score (LIS) quantifies the presence, severity and evolution of acute and chronic lung damage in patients with Adult Respiratory Distress Syndrome (ARDS). The LIS was calculated based on PaO2/FiO2 ratio, PEEP, and stepwise logistic regression were performed to assess differences in survivorship.

RESULTS: Nineteen of 22 patients with ARDS met inclusion criteria. By conventional scoring, the average LIS in this population was 3.32 (range 1.2-6.5) compared to the standard PaO2/FiO2 cut-off of <100 (PPV is positive predictive value). The objective was to evaluate the validity of the LIS as an instrument to measure prognosis in pregnant patients with ARDS.

METHODS AND MATERIALS: A retrospective chart review (Jan. 90-Dec. 95) identified gravidas meeting American-European Consensus criteria for ARDS (1994). The LIS was calculated based on PaO2/FiO2 ratio, PEEP, and stepwise logistic regression were performed to assess differences in survivorship.

RESULTS: Sensitivity 60% (p=0.07), specificity 100%, PPV 100%, NPV 64%, LR+ 63%, LR- 64%. The best of 3 consecutive PEFR readings was used for each gestational age and position. Differences between positions at each gestational period and between periods for each position were analyzed using 1-way repeated measure ANOVA. The interaction between gestational-age and position was analyzed using 2-way repeated measure ANOVA. The Student-Newman-Keuls test was used in the post-hoc analysis. p<0.05 was considered significant.

CONCLUSIONS: The LIS was calculated based on PaO2/FiO2 ratio, PEEP, and stepwise logistic regression were performed to assess differences in survivorship. The LIS was calculated based on PaO2/FiO2 ratio, PEEP, and stepwise logistic regression were performed to assess differences in survivorship.
470 CARDIAC TROTONIN T LEVELS IN UMBILICAL CORD BLOOD IN NORMAL AND COMPLICATED PREGNANCIES. S. Shelton, C. Hollemant1, B. Fouse, F. Sedor, W.N.P Herbert Dept of Ob/Gyn and Pathology, Duke University Medical Center, Durham, NC.

OBJECTIVE: Troponin T (TnT) is a protein that binds to troponin in cardiac muscle. Normally undetectable in serum, it is elevated in adults experiencing myocardial ischemia or infarction. Our objective was to evaluate TnT in umbilical cord blood samples from both normal and complicated pregnancies and further, to determine which clinical factor(s) may influence these levels in the fetus.

STUDY DESIGN: Arterial and venous umbilical cord blood samples were obtained from 209 patients of whom 191 had sufficient quantities for analysis. Following blood gas analysis, the specimens were frozen and obtained from 209 patients of whom 191 had sufficient quantities for analysis. Assays were later performed in duplicate. TnT levels were analyzed using Fisher's exact test.

CONCLUSION: TnT levels are elevated in fetuses from pregnancies complicated by preeclampsia, diabetes, or preterm delivery. While 2 subjects had a positive correlation between PCWP and CI (p=0.5), there was no consistent relationship between CI and TnT levels. In this study, TnT was not found to be more predictive of cardiac index (CI) and response to volume repletion than pulmonary capillary wedge pressure (PCWP) in critically ill nonpregnant patients. The purpose of this study is to evaluate the accuracy to this modality in patients with severe preeclampsia.

STUDY DESIGN: From 1997-1998, 9 patients with the diagnosis of preeclampsia of eclampsia met the criteria for central hemodynamic monitoring. Using the Baxter 93A-7541, a pulmonary artery catheter with a rapid-response directed thermost, simultaneous measurements of PCWP, RVEDVI and CI were obtained. Correlations between these values were calculated using linear regression analysis.

RESULTS: Our study groups included 23,210 (84%) women <200 lbs, 4,049 (15%) who were 201-299 lbs, and 283 (1%) women >300 lbs. Women who weighed >200 lbs had >200 lbs at their first prenatal visit, were at increased risk for fetal or neonatal death and maternal morbidity.

CONCLUSION: A majority of women in early pregnancy have rhythm disorders on ambulatory electrocardiography that do not correspond with symptomatic episodes. This study has established longitudinally, for the first time, the frequency of rhythm disturbance in early pregnancy.

472 AMBULATORY ELECTROCARDIOGRAPHY IN NORMAL PREGNANCY-A LONGITUDINAL STUDY. M. Ni Bhuinneain, A. O'Herlihy, D. Sugrue, M. Codd, Rotunda and Mater Misericordiae Hospitals, Dublin and University College Dublin, Ireland.

OBJECTIVE: To determine the frequency of abnormal ambulatory electrocardiographic findings during early pregnancy and to correlate their presence with arrhythmias with cardiac symptoms.

STUDY DESIGN: A descriptive longitudinal study of 100 women in the first trimester. Exclusion of women with cardiovascular disease, diabetes melitius, thyroid disease, chronic illness or medications, abnormal cardiovascular signs or multiple gestation. Congenital arrhythmias, thyroid dysfunction and anemia were excluded prior to monitoring. Subjects were monitored with 24-hour ambulatory electrocardiography at home; intervals corresponding to the times of maximum hemodynamic change i.e. between 6-10 weeks, 14-18 weeks and 22-26 weeks. Tapes were analyzed with a Reynolds Medical Pathfinder 3 by a single observer.

RESULTS: Data are summarized in Table 1. No statistical difference in regard to fetal and neonatal death.

CONCLUSION: In our population, women who weighed >200 lbs and especially those ≥200 lbs at their first prenatal visit, were at increased risk for fetal or neonatal death and maternal morbidity.


OBJECTIVE: To determine maternal and perinatal outcomes associated with increased maternal weight.

STUDY DESIGN: A computerized database was utilized to identify 27,540 women with singleton gestations who delivered at our institution between January 1, 1991 and June 30, 1998. Patients were grouped based on their maternal weight at last prenatal visit. Selected maternal and perinatal outcomes were compared among these groups.

RESULTS: Our study groups included 23,210 (84%) women <200 lbs, 4,049 (15%) who were 201-299 lbs, and 283 (1%) women >300 lbs. Women who weighed >200 lbs or 201-299 lbs were older (27.4 vs 25.0, p<.001) and more often multiparous (70.3 vs 66.9 vs 55.4%, p<.001) than were those ≤200 lbs. Table 1 depicts selected outcomes among the three groups.

CONCLUSION: There in no consistent relationship between CI and RVEDVI in patients with severe preeclampsia. Although limited in data secondary to sample size, this study can not support the use of a more expensive modality in this subgroup of patients.
476 PROGNOSTIC INDICATORS OF FETAL THYROID DISORDERS IN WOMEN WITH GRAVES' DISEASE. H. Harli, D. Strickland. Department of OB/GYN, East Carolina University School of Medicine.

OBJECTIVE: The purpose of this study was to determine prognostic indicators of fetal thyroid disorders in women treated for Graves' disease.

STUDY DESIGN: During a six year period 128 pregnancies in 96 women treated with propylthiouracil for Graves' disease were studied. Maternal characteristics as well as medical complications during pregnancy, i.e., preeclampsia, preterm labor, growth restriction, etc. were also examined.

Maternal serum TSI and TBIII antibodies were measured and ultrasound was used to determine fetal thyroid enlargement. PUPS was used to assess fetal thyroid function when fetal goiter were detected and antibodies were positive.

RESULTS: The incidence of preeclampsia, preterm labor and stillbirth were increased, 16%, 27.3% and 2.3% respectively. The incidence of TSI and TBIII antibodies in Graves' disease were 64% and 44.5%. Only 6 patients (4.6%) had combination of both TSI and TBIII antibodies. Of these, four fetuses had no congenital goiter. On all these four fetuses with goiter, PUPS showed one with hypothyroidism and the remaining three had hyperthyroidism. Hypothyroid fetuses were successfully treated with intramuscular instillation of thyroxine.

CONCLUSION: Women with Graves' disease during pregnancy who have positive TSI and/or TBIII antibodies may be at risk for development of fetal hypo- or hyperthyroidism. Presence of antibodies combined with ultrasound finding of fetal goiter are the most significant determinants of fetal thyroid disorder. PUPS can determine hypo- or hyperthyroidism in fetus and in utero management of hyperthyroidism with thyroxine may potentially prevent fetal brain damage.


OBJECTIVE: To evaluate the pharmacokinetics of enoxaparin sodium after subcutaneous administration in pregnant women and to compare the pharmacokinetics during and after pregnancy.

STUDY DESIGN: Enoxaparin sodium (40 mg) was administered daily intramuscularly at 10 am during pregnancy and once on the day of delivery in women with documented cervical change. Samples were collected and plasma analyzed for anti-factor Xa activity.

RESULTS: The time to maximum concentration (Tmax) and the mean residence time (MRT) were not significantly different in pregnancy or postpartum. The area under the plasma activity versus time curve (AUC) was significantly lower in pregnancy than in the non-pregnant state (p < 0.05).

CONCLUSION: The pharmacokinetics of enoxaparin sodium is significantly different in pregnancy than in the same women when non-pregnant. The observed differences are likely to increase renal clearance during pregnancy. This finding has significant implications for appropriate dosing of low molecular weight heparin in pregnancy.

OBJECTIVE: The factor V Leiden mutation is the most common inherited coagulation defect and has been associated with adverse obstetrical outcomes. Previous studies have indicated a high false positive rate for the standard aPCr test when used in pregnant patients. We tested the hypothesis that a modified aPCr test, using dilution in factor V deficient plasma, is a superior screening tool for the factor V Leiden mutation in pregnancy and that alterations in thrombomodulin, protein S, and factor VIII contribute to aPCr in pregnancy.

STUDY DESIGN: In a cross-sectional observational design, samples from 50 healthy low risk patients and 20 non pregnant controls were tested using the modified aPCr test (Jorquera). Pregnant patients were screened at 24-28 weeks. The results were then compared to genetic analysis for the factor V Leiden mutation. Factor VIII and protein S were measured by coagulometric assays in all patients and thrombomodulin was measured by ELISA in a random subgroup.

RESULTS: PCR based genetic analysis identified 4 patients with the factor V Leiden mutation. In contrast to previous reports using the original aPCr test, all patients were correctly classified by the modified test (normal ratio >1.70) resulting in 100% sensitivity and specificity. The mean aPTT ratio for the modified aPCr resistance test in the 55 factor V Leiden negative patients was 2.03 ± 0.13 (mean ± SD) which was significantly lower than that in non-pregnant controls (2.27 ± 0.25). The ratios did not correlate with factor VIII, protein S or thrombomodulin concentrations.

CONCLUSIONS: The modified aPCr screening test proposed by Jorquera is a superior screening tool for the identification of the factor V Leiden mutation in pregnancy. A lower mean aPTT ratio was seen in pregnancy which does not appear to be explained by alterations in factor VIII, protein S or thrombomodulin.

479 TREATMENT WITH LOW-MOLECULAR-WEIGHT HEPARIN IMPROVES OUTCOME IN PATIENTS WITH INHERITED THROMBOPHILIAS ASSOCIATED WITH SEVERE PREGNANCY COMPLICATIONS. M.J. Kufmanx, A. Many, A. Eldorx, D. Pauzner, M. Shenhavx, A. Baramx, J.D. Lesingx, Dept. Ob/Gyn Lis Maternity Hospital, & Dept. Hematology, Tel Aviv Sourasky Medical Center, The Sackler Faculty of Medicine, Tel Aviv Univ., Israel.

OBJECTIVE: To evaluate the outcomes of treated pregnancies in women who had severe obstetric complications and were found to have an inherited thrombophilia.

STUDY DESIGN: 32 patients who had severe pregnancy complications, but no history of thromboembolic events were tested for, and found to carry inherited thrombophilias: Factor V A506-G (FV Leiden) mutation (n=11), 2 homozygotes, homozygotes for methyleneetetrahydrofolate reductase (MTHFR) C677->T mutation (n=10), heterozygotes for prothrombin G20210->A (Factor II) mutation (n=4), and deficiencies of protein S or protein C (n=7). Pregnancy complications were severe preeclampsia (PE) (n=11) [associated in 5 cases with fetal growth restriction (FGR)], abruptio placenta (n=5), FGR (< 5th percentile) (n=10), stillbirth (n=5), and preterm labor > 2 (n=1). In their subsequent pregnancy, all patients were treated daily with low-molecular weight heparin (LMW heparin, nadroxaparin, Lovenox, Roeriger France), 40 mg S.C and 100 mg aspirin starting at 12 weeks gestation until 6 weeks after delivery. Patients who were homozygotes for MTHFR also received folic acid 5 mg/day.

RESULTS: The mean gestational age at delivery in previous complicated pregnancies was 32.2 ± 4.9 weeks, compared to 37.7 ± 4.9 weeks in treated pregnancies (P<0.0001). The mean birth weight in previous pregnancies was 1125 ± 655 grams compared to 2795 ± 540 grams in the treated pregnancies (P<0.0001). Pregnancy complications occurred in only 3 (9.4%) treated pregnancies (P<0.0001) (Severe PE and FGR in 1 patient, FGR in 2 patients), and all the newborns survived with no morbidity. No patient had had systemic side effects.

CONCLUSIONS: In patients with obstetric complications and an inherited thrombophilia, treatment with LMW heparin + aspirin may be considered in subsequent pregnancies.

480 FRAGMIN® VERSUS UNFRACTIONATED HEPARIN (UFH) FOR PROPHYLACTIC ANTI-COAGULATION DURING PREGNANCY. M. & Verana, G. Yatawara*, P. Traill, M. Hardacre1. Dept. OB/GYN, Eastern Virginia Medical School, Norfolk, VA.

OBJECTIVE: To assess the feasibility of using Fragmin® [a low molecular weight heparin] during pregnancy for prophylactic anticoagulation.

STUDY DESIGN: This is a pilot retrospective cohort study comparing perinatal outcomes in 23 patients treated with Fragmin® vs. 39 treated with UFH for prophylactic anticoagulation. Dosing was either Fragmin® 2,500 IU sq. or UFH 5,000 U sq. bid. If maternal weight was >170 lbs doses were increased to Fragmin® 5,000 IU qd or UFH 8,000 U sq. bid respectively.

RESULTS: Reasons for anticoagulation were similar in both groups and included: antiphospholipid syndrome, history of DVT or embolus, protein S deficiency, Factor V Leiden mutation or morbid obesity. Maternal demographics and pregnancy complications including preeclampsia, preterm labor, miscarriage, IUGR or oligohydramnios were similar. No thromboembolic disease, thrombocytopenia, allergic reactions or anemia complications occurred.

<table>
<thead>
<tr>
<th>OUTCOME</th>
<th>FRAGMIN</th>
<th>UFH</th>
<th>RR [C.I]</th>
<th>P Val</th>
</tr>
</thead>
<tbody>
<tr>
<td>N= 23 [%]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EGA @ start of Tx [wks]</td>
<td>14.9 ± 5.4</td>
<td>10.2 ± 4.5</td>
<td>N.A.</td>
<td>0.2</td>
</tr>
<tr>
<td>EGA @ delivery [wks]</td>
<td>36.3 ± 2.7</td>
<td>36.6 ± 2.4</td>
<td>N.A.</td>
<td>0.5</td>
</tr>
<tr>
<td>Cesarean section rate</td>
<td>11 [48]</td>
<td>18 [46]</td>
<td>1.0 [0.6, 1.8]</td>
<td>0.9</td>
</tr>
<tr>
<td>Regional anesthesia used</td>
<td>10 [45]</td>
<td>55 [85]</td>
<td>0.5 [0.5, 0.8]</td>
<td>0.09</td>
</tr>
<tr>
<td>No anesthesia used</td>
<td>4 [17]</td>
<td>5 [13]</td>
<td>1.4 [0.4, 4.5]</td>
<td>0.6</td>
</tr>
<tr>
<td>Hrt. change @ del'v</td>
<td>-5.8 ± 3.1</td>
<td>-7.9 ± 3.7</td>
<td>N.A.</td>
<td>0.4</td>
</tr>
<tr>
<td>Hospital LOS [days]</td>
<td>4.8 ± 2.9</td>
<td>3.9 ± 1.7</td>
<td>N.A.</td>
<td>0.2</td>
</tr>
</tbody>
</table>

CONCLUSIONS: Fragmin® use in pregnancy is feasible and has minimal risk with the potential for improved patient compliance [longer treatment spans and less frequent dosing due to lower bioavailability]. Anesthesiologists' reluctance to use regional anesthesia with Fragmin® has been an issue at our institution. With the recently available anti-Factor Xa activity assays to assess degree of anticoagulation, this risk may no longer pose a problem in clinical practice.

481 THE ASSOCIATION OF FACTOR-V LEIDEN MUTATION AND ACQUIRED CIRCULATING ANTIBODIES WITH OBSTETRICAL COMPLICATIONS. D. Ogunseni. Perinatology Unit, Morristown Memorial Hospital, Morristown, NJ.

OBJECTIVE: This is an ongoing prospective study to assess the relationship of obstetrical complications with inherited thrombophilia or acquired circulating antibodies.

STUDY DESIGN: 32 patients with habitual abortions (AB), stillbirth (SB), intrauterine growth restriction (IUGR), severe unexplained oligohydramnios, preeclampsia < 32 weeks (PE) and deep venous thrombosis (DVT) were tested for factor-V Leiden, antinuclear antibody (ANA), anticardiolipid antibody (ACLA), lupus anticoagulant (LAC), homocysteine levels. Some patients had multiple indications for testing.

RESULTS:

<table>
<thead>
<tr>
<th>OUTCOME</th>
<th>AB</th>
<th>SB</th>
<th>IUGR</th>
<th>OLIGO</th>
<th>PE</th>
<th>DVT</th>
</tr>
</thead>
<tbody>
<tr>
<td>No of cases</td>
<td>18</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>8(44%)</td>
<td>2(40%)</td>
<td>2(66%)</td>
<td>2(100%)</td>
<td>2(66%)</td>
<td>3(67%)</td>
<td></td>
</tr>
<tr>
<td>1 or more test</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

The mean age was 34 (SEM = 863), 52% were nulliparous and 86% Caucasian. Overall 17/32 (53%) had one or more positive tests; 7/32 (22%) were positive for the heterozygous Leiden factor-V mutation; 11/32 (34%) were positive for LAC and or ACLA; 2 cases were positive for ANA only. For comparison, the incidence of heterozygous factor-V Leiden in our female population is approximately 7%.

CONCLUSION: Patients with significant obstetrical complications may benefit from testing for causes of thrombophilia. Pregnancy outcome could be improved by treatment and a diagnosis of thrombophilia is important for genetic counseling, future medical and pregnancy management.
483 PRESENTATION OF VENOUS THROMBOEMBOLISM DURING PREGNANCY. A.G. Wu, B. Hamar, G. Sade, B. Sibahi, Dept. Ob/Gyn, Univ. of Texas Medical Branch at Galveston, TX, and Univ. of Tenn. Memphis, TN.

OBJECTIVE: To characterize the presentation, recurrence, and outcome of venous thromboembolism (VTE) during pregnancy.

STUDY DESIGN: A 12-year, single-center, retrospective review of 38 cases of VTE during pregnancy. The independent variables were: time of presentation (antenatal [AP] vs. postpartum [PP]), gestational age (GA) at delivery, birthweight, mode of delivery, previous history of VTE, use of heparin prophylaxis, presence of a hypercoagulable state, type of VTE were subjected to univariate analysis (unpaired t-test for normally distributed continuous variables, and Fisher exact test for discrete variables).

RESULTS: The GA at presentation appears more equally distributed than previously reported. There is no correlation between GA at delivery, birthweight, mode of delivery, and time of presentation (AP vs. PP). Despite limited numbers, the 80% (4/5) recurrence of VTE despite use of prophylactic heparin therapy suggests the need to reexamine the current recommendations for heparin dosing. Furthermore, a hypercoaguable work-up should be performed for those women with recurrent VTE or VTE presenting in uncommon sites.

CONCLUSION: Although open fetal surgery has great promise for diagnosis and treatment, the potential for significant maternal risk remains. Fetal surgery should be performed only in specialized centers with proving perinatal outcome, the potential for significant maternal risk after C/S included endometritis (8) and wound infection/separation (2). The mean duration from surgery to delivery was 40 days (5-91 days). The mean hospital charge (excluding fetal surgery and professional fees) was $33,455 (range $9,914-$84,762). Indications for delivery were PROM and/or preterm labor (15), hydrd (2), and bleeding (1). All deliveries were by C/S (8 cases included endometritis (8) and wound infection/separation (2). Mean time hospitalized (fetal surgery + C/S) was 17.7 days (11-23 days). Mean time hospitalized (fetal surgery + C/S) was 17.7 days (11-23 days). Mean time delivered was 126 minutes (52-288 min).

CONCLUSIONS: Although open fetal surgery has great promise for improving perinatal outcome, the potential for significant maternal risk remains. Fetal surgery should be performed only in specialized centers with a multidisciplinary team specifically trained in and dedicated to fetal diagnosis and treatment.

484 NON-OBSTETRICAL ABDOMINAL SURGERY DURING PREGNANCY IN A WOMEN'S HOSPITAL. T. Genterfeld, D. Chang, A. Pliego, D. Wing. Dept. Ob/Gyn, Univ. of Southern California School of Medicine, Los Angeles, CA.

OBJECTIVE: To determine if non-obstetrical abdominal surgery during pregnancy in a women's hospital is associated with poor outcome.

STUDY DESIGN: A retrospective review of all cases of non-obstetrical surgery in our institution during a 61/2 year period ending Nov. 1997 was performed. Continuation of pregnancy was desired in all cases. Cases excluded from the review included cerclage placement and surgery in which an ectopic pregnancy was diagnosed. Parameters assessed included indication, type of surgical procedure, total operative time, surgical complications, use of tocolytic therapy, frequency of preterm birth, birthweight and Apgar scores.

RESULTS: 96 cases of non-obstetrical surgery were identified. 80 women underwent laparotomy, while 16 had laparoscopic surgery. Operative diagnoses included appendicitis (34.3%), adnexal cyst (35.4%), adnexal torsion (14.5%), myoma (3.1%) and cholecystitis (1%), 77% of patients had the same preoperative as postoperative diagnoses. The most common misdiagnosis was adnexal torsion, 44% of the time an adnexal mass without torsion was found. 2% (2/96) of the women had a spontaneous loss following surgery, one in the first trimester and one in the second trimester. In both cases an appendectomy was done. The woman with a first trimester loss (6 weeks EGA) had a ruptured appendix, while the woman with a second trimester loss (18 weeks EGA) was found postoperatively to have a severe pleuroperitonitis. 44 women had surgery during the first trimester, 49 during the second trimester and 2 during the third trimester. Tocolytic therapy was used in 22.9% of the cases. Mean operative time was 75.6 ± 36.2 minutes. Short-term follow-up (fetal heart tones) at 1 week after surgery was available in 81.3% of the cases, and at 4 weeks postoperatively in 50% of the cases. Delivery data was obtained on 55.4% of cases studied. All women delivered at 8 weeks EGA, 79% after 37 weeks and 88% after 36 weeks EGA. Mean birth weight was 3256 ± 812 gms. Median Apgar score at 1 min. was 8.5 (range 4-10) and at 5 min. was 9 (range 7-10).

CONCLUSION: Non-obstetrical abdominal surgery in pregnancy in a women's hospital was associated with a low preterm delivery and low rate.

485 CHERNOBYL NUCLEAR ACCIDENT AND MATERNAL HEALTH. B. Petrikovsky, L. Sichina, A. Ostrovsky. North Shore University Hospital, Manhasset, NY, Moscow University School of Medicine, Moscow, Russia.

OBJECTIVE: Analysis of the effect of the Chernobyl nuclear accident (CNA) on maternal complications of pregnancy.

STUDY DESIGN: Maternal morbidity statistics were obtained and analyzed from three different periods: 1985 (pre-CNA), 1987 (immediately after CNA), and 1996 (10 years later).

RESULTS: Incidence of selected maternal complications.

<table>
<thead>
<tr>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Prematurity</td>
<td>6.2%</td>
<td>6%</td>
<td>5%</td>
</tr>
<tr>
<td>Preeclampsia</td>
<td>5.8%</td>
<td>6.2%</td>
<td>8%</td>
</tr>
<tr>
<td>Hemoglobin</td>
<td>5.9%</td>
<td>6.2%</td>
<td>5.8%</td>
</tr>
<tr>
<td>Anemia</td>
<td>4%</td>
<td>4%</td>
<td>5.8%</td>
</tr>
<tr>
<td>Thyroid disorders</td>
<td>4.6%</td>
<td>4.6%</td>
<td>4.6%</td>
</tr>
<tr>
<td>Cancer in pregnancy</td>
<td>3%</td>
<td>3%</td>
<td>3%</td>
</tr>
</tbody>
</table>

CONCLUSIONS: There was a significant increase in the rates of anemia and thyroid disorders (mainly hypothyroidism) associated with the CNA. There was a significant increase in cancers in pregnancy after the accident. No increase in maternal morbidity occurred ten years later.

OBJECTIVE: The current study investigated whether ethnic groups differed in their exposure to stressful life events during the course of pregnancy, and if this exposure to stressors could explain ethnic differences in birth outcomes.

STUDY DESIGN: Four hundred and ninety-seven women (226 African-Americans [Af-Am.], 164 Latinas [Lat.], 107 Caucasians [Cauc.]) were recruited for in-patient nicotine patch therapy (NPT) during the third trimester. The women were categorized according to the type of stressor (e.g., relationship, financial) and the time the stressor occurred (e.g., first trimester, second trimester).

RESULTS: Chi-square tests revealed many significant ethnic differences in exposure to types of stressful events. Moreover significant ethnic differences were noted for birth outcomes: Af-Am. women delivered significantly smaller babies and had a significantly higher incidence of preterm delivery than both Lat. and Cauc. women. Multivariate analyses were then performed to explain differences in birth outcomes, after controlling for medical risk, with ethnicity, stress and socioeconomic status (SES) as predictor variables. Ethnicity, stress, and socioeconomic status predicted birthweight, controlling for gestational age. In addition, a number of significant two-way interactions involving ethnicity and stress, and a number of significant three-way interactions involving ethnicity, stress, and socioeconomic status, were found. For example, Af-Am. women, and particularly low SES Af-Am. women, who were exposed to relationship stressors during the third trimester gave birth to smaller babies than both Lat. and Cauc. women. Significant interactions involving ethnicity were also found for stressors encountered at the workplace and at home.

CONCLUSIONS: It appears that ethnic differences in exposure to stressful life events help explain ethnic differences in birth outcomes. However, this relationship is complex and the interactive effects of SES, types of stress, and timing of stress must be considered.


OBJECTIVE: To test the hypothesis that preeclampsia (PE) and acute fetal asphyxia (FA) cause fetal myocardial cell destruction leading to elevated fetal cardiac troponin-T (TnT) levels.

STUDY DESIGN: Umbilical artery (UA) blood samples were collected immediately after delivery in 66 normal uncomplicated pregnancies, 7 preeclamptic pregnancies and in 6 pregnancies complicated with acute fetal asphyxia (p<0.01). N-terminal peptide of proatrial natriuretic peptide (NT-proANP) which is released in equimolar amounts with ANP from cardiac myocytes was analyzed from the blood samples. NT-proANP was radioimmunoassayed directly from 25 µl unextracted plasma with the sensitivity of 40 pmol/l plasma.

RESULTS: All the results are expressed as mean±SD, *p<0.05, **p<0.01 (comparing to normal group). GA= Gestational age.

<table>
<thead>
<tr>
<th>GA at delivery (w)</th>
<th>Birthweight (g)</th>
<th>MV NT-proANP (pmol/l)</th>
<th>UA NT-proANP (pmol/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal 40.0±1.1</td>
<td>3714±408</td>
<td>482±201.7</td>
<td>594±273</td>
</tr>
<tr>
<td>PE 37.0±2.7**</td>
<td>2538±830**</td>
<td>691.7±333.2**</td>
<td>1314±655.9**</td>
</tr>
<tr>
<td>FA 39.2±2.0</td>
<td>3373±705*</td>
<td>369.6±91.6</td>
<td>1072±842.5*</td>
</tr>
</tbody>
</table>

CONCLUSIONS: In preeclampsia, maternal and umbilical artery UA blood samples were collected immediately after delivery in 66 normal uncomplicated pregnancies, 7 preeclamptic pregnancies and in 6 pregnancies complicated with acute fetal asphyxia. In preeclampsia, umbilical artery NT-proANP levels were significantly higher compared to normal pregnancies. In preeclampsia pregnancies and in 6 pregnancies complicated with acute fetal asphyxia, cardiac specific TnT which reflects the myocardial cell damage was analyzed from the blood samples using commercially available ELSA-test kit (Enzymun-Test, Boehringer Mannheim Immunodiagnostics).

RESULTS: All the results are expressed as mean±SD, *p<0.05, **p<0.01 (comparing to normal group). GA= Gestational age.

<table>
<thead>
<tr>
<th>GA delivery at (w)</th>
<th>Birthweight (g)</th>
<th>UA TnT (µg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal 40.0±1.1</td>
<td>3714±408</td>
<td>0.015±0.007</td>
</tr>
<tr>
<td>PE 37.0±2.7**</td>
<td>2538±830**</td>
<td>0.059±0.049**</td>
</tr>
<tr>
<td>FA 39.2±2.0</td>
<td>3373±705*</td>
<td>0.012±0.027</td>
</tr>
</tbody>
</table>

CONCLUSIONS: In preeclampsia pregnancies, umbilical artery TnT values are significantly higher compared to normal pregnancies. Umbilical artery TnT values are similar in acute fetal asphyxia to normal pregnancies. These results suggest that human fetal myocardial tolerates short-term decrease in oxygen supply. However, increased afterload and sympathetic stimulus in preeclampsia may lead to fetal myocardial cell damage.


OBJECTIVE: The null hypothesis is that maternal nicotine patch therapy causes clinically important changes in one or more of the following tests for fetal well-being: NST, BPP, or umbilical doppler of the umbilical artery (S/D ratio).

STUDY DESIGN: Pregnant cigarette smokers (n=21) in the third trimester were recruited for in-patient nicotine patch therapy (NPT) (22 mg/24 hr). Tests for fetal well-being (NST, BPP, and doppler flow of the umbilical artery [systolic/diastolic ratio = S/D]) were done before NPT when smoking and then repeated for each of 4 days of nonsmoking hospital monitored NPT at times corresponding to trough and peak nicotine.

RESULTS: Maternal mean serum levels and urinary excretion of nicotine and cotinine were not different when comparing the baseline smoking state to the steady state of NPT on day 4. NST were reactive 90% to 100% of all testing periods; when NST were initially nonreactive, continued monitoring led to spontaneous reversion to a reactive tracing. BPP were reassuring; in all cases S/D or 10/10 scores were obtained. No significant changes were seen in S/D (mean values 3.4±0.7 to 3.7±1.0) and in no case was S/D > 6.0. The only significant change seen was in the mean baseline fetal heart rate, which increased at peak nicotine levels on NPT days 2, 3, and 4 (as great a change as 7 bpm). This change was not judged to be clinically important.

CONCLUSIONS: NPT in a controlled environment resulted in no fetal compromise during 4 days of continuous treatment and observation. NPT produces nicotine and cotinine levels similar to the smoking state in pregnancy without evidence of fetal risk. The results support NPT as a reasonable component of smoking cessation therapy in pregnancy.


OBJECTIVE: The hypothesis is that preeclampsia (PE) and acute fetal asphyxia (FA) induce atrial natriuretic peptide (ANP) production of the human fetal heart.

STUDY DESIGN: Maternal mean (MV) and umbilical artery (UA) blood samples were collected immediately after delivery in 50 normal uncomplicated pregnancies, 7 preeclamptic pregnancies and in 5 pregnancies with acute fetal asphyxia (p<0.001). N-terminal peptide of proatrial natriuretic peptide (NT-proANP) which is released in equimolar amounts with ANP from cardiac myocytes was analyzed from the blood samples. NT-proANP was radioimmunoassayed directly from 25 µl unextracted plasma with the sensitivity of 40 pmol/l plasma.

RESULTS: All the results are expressed as mean±SD, *p<0.05, **p<0.01 (comparing to normal group). GA= Gestational age.
490 HEMODYNAMIC EFFECTS OF INDUCED FETAL ANEMIA IN CYNOLOGUS MONKEYS. JC Veille, WA Block*, MG O'Sullivan*, ML Draper*, Wake Forest Univ. School of Medicine, Winston-Salem, NC.

OBJECTIVES: To assess the effect of chronic anemia on Doppler waveforms of the Umbilical Artery and across the Mitral/Tricuspid valves in cynomolgus monkeys after direct inoculation of simian parvovirus.

MATERIAL & METHODS: Mild, moderate and severe anemia was induced in seven cynomolgus monkeys by direct fetal inoculation of simian parvovirus. Fetal hemodynamic parameters were assessed using pulsed Doppler at the same time as we assessed fetal blood hemoglobin.

RESULTS: 1) umbilical artery Doppler indices did not significantly change with fetal anemia, even during severe fetal anemia, 2) Neither Mitral nor Tricuspid E/A ratio changed with severe anemia.

CONCLUSION: Doppler waveforms of the Umbilical artery and across the A-V valves in this monkey anemia model, did not predict fetal anemia.

491 LONGITUDINAL STUDY OF ANNULAR SIZE IN NORMALLY GROWN AND IUGR FETUSES. JC Veille, N Smith*, D Zaccaro*, Dept. Ob/Gyn., Public Health Wake Forest Univ. School of Medicine, Winston-Salem, NC.

OBJECTIVES: To determine if IUGR fetuses have a smaller rate of growth of the annuli when compared to normally grown fetuses.

HYPOTHESIS: IUGR fetuses decrease the rate of growth of the annuli compared to normally grown fetuses.

MATERIAL AND METHODS: Seventy nine normally grown and 29 IUGR fetuses were prospectively followed from early gestation (-16th weeks) to year one of age using Doppler echocardiography. Measurements of the right and left annuli were obtained during diastole.

RESULTS: The rate of growth were significantly lower both for the Mitral and the Tricuspid (Fig. 1) and the Mitral (Fig. 2) annuli during the fetal period (p < 0.0005 and 0.026 respectively) but not during the neonatal infancy period.

CONCLUSIONS: Fetuses "predisposed" to be smaller at birth, have a slower rate of growth of their annuli which may in turn result in a lower ventricular output. The annular rate of growth "catches-up" during the first year of life.

492 EFFECTS OF BICYCLE EXERCISE (EX) ON THE EXTERNAL AND INTERNAL ILIAC ARTERIES DURING PREGNANCY AND AT 12 WEEKS POSTPARTUM. JC Veille, N. Smith*, Dept. Ob/Gyn, Wake Forest Univ. School of Medicine, Winston-Salem, NC.

INTRODUCTION: The effects of exercise on uterine circulation show conflicting as the type of EX, duration and placental location may influence results.

PURPOSE: To study longitudinally the effects of bicycling on the right and left external iliac arteries (REA, LEA) and iliac arteries (RIA, LIA).

MATERIAL & METHODS: Five normal patients were studied three times during pregnancy (18 ±1, 28±1, 38±3 weeks respectively) and once 12 weeks postpartum (PP). Pre and post EX (PE) Doppler (PD) studies were obtained with a lateral displacement of the uterus. Pulsed waveforms (PW) were visualized using color Doppler ultrasound and PD was obtained at rest and immediately post EX (PE). Studies were recorded and videotaped for later analysis.

RESULTS: 1) umbilical artery Doppler indices did not significantly change with fetal anemia, even during severe fetal anemia, 2) Neither Mitral nor Tricuspid E/A ratio changed with severe anemia.

CONCLUSIONS: 1) EX seem to influence the pelvic vasculature only during the 1st part of pregnancy, 2) this may reflect the fact that these pelvic vessels are maximally dilated thereafter, 3) EX does not appear to increase the vascular resistance of these vessels.

493 THE EFFECT OF MAGNESIUM SULFATE ON FETAL RAT BRAIN AND BODY PHYSICAL CHARACTERISTICS. Meredeh Hallak, John W. Hotra*, Department of Obstetrics and Gynecology, Wayne State University School of Medicine, Detroit, Michigan.

OBJECTIVE: Controversy exists regarding the association between prenatal exposure to magnesium sulfate (MgSO4) and fetal brain injury. This study was initiated to determine whether maternal MgSO4 peripheral administration during pregnancy might affect fetal rat body & brain weight and size.

STUDY DESIGN: Two groups of pregnant Long-Evans rats were included (n=22). At 17 days' gestation (GD), animals were injected subcutaneously with a loading dose of 270 mg/kg of MgSO4 or saline followed by 27 mg/kg every 21 minutes, for 4 hours (21a study). At 17 days' gestation (GD), animals were injected subcutaneously with a loading dose of 270 mg/kg of MgSO4 or saline followed by 27 mg/kg every 21 minutes, for 4 hours (2nd study). Studies were recorded and videotaped for later analysis. Pulsed waveforms were subsequently traced using a tablet digitizer in order to obtain the pulsatility index (PI). Statistical analysis was done using t-test in order to compare pre and post exercise PI values at each study period and at 12 wks PP. Results for REA / RIA are illustrated below. Discussion: 1) The REA and RIA PI were significantly lower during PO in the 1st study. There was no significant difference in either the PI of the REA or the LIA between rest and EX at any of the other time periods studied. 2) EX does not appear to increase the vascular resistance of these vessels.

CONCLUSIONS: 1) EX seem to influence the pelvic vasculature only during the 1st part of pregnancy, 2) this may reflect the fact that these pelvic vessels are maximally dilated thereafter, 3) EX does not appear to increase the vascular resistance of these vessels.

494 THE EFFECT OF MAGNESIUM SULFATE ON FETAL RAT BRAIN AND BODY PHYSICAL CHARACTERISTICS. Meredeh Hallak, John W. Hotra*, Department of Obstetrics and Gynecology, Wayne State University School of Medicine, Detroit, Michigan.

OBJECTIVE: Controversy exists regarding the association between prenatal exposure to magnesium sulfate (MgSO4) and fetal brain injury. This study was initiated to determine whether maternal MgSO4 peripheral administration during pregnancy might affect fetal rat body & brain weight and size.

STUDY DESIGN: Two groups of pregnant Long-Evans rats were included (n=22). At 17 days' gestation (GD), animals were injected subcutaneously with a loading dose of 270 mg/kg of MgSO4 or saline followed by 27 mg/kg every 21 minutes, for 4 hours (2nd study). Tail venous blood was collected for magnesium levels at the beginning and conclusion of the injection period. At GD 20, rats were perfused and cesarean sections obtained with a lateral displacement of the uterus. Pulsed waveforms (PW) were visualized using color Doppler ultrasound and PD was obtained at rest and immediately post EX (PE). Studies were recorded and videotaped for later analysis. Pulsed waveforms were subsequently traced using a tablet digitizer in order to obtain the pulsatility index (PI). Statistical analysis was done using t-test in order to compare pre and post exercise PI values at each study period and at 12 wks PP. Results for REA / RIA are illustrated below. Discussion: 1) The REA and RIA PI were significantly lower during PO in the 1st study. There was no significant difference in either the PI of the REA or the LIA between rest and EX at any of the other time periods studied. 2) EX does not appear to increase the vascular resistance of these vessels.

CONCLUSIONS: 1) EX seem to influence the pelvic vasculature only during the 1st part of pregnancy, 2) this may reflect the fact that these pelvic vessels are maximally dilated thereafter, 3) EX does not appear to increase the vascular resistance of these vessels.

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CONCLUSIONS: 1) EX seem to influence the pelvic vasculature only during the 1st part of pregnancy, 2) this may reflect the fact that these pelvic vessels are maximally dilated thereafter, 3) EX does not appear to increase the vascular resistance of these vessels.
494 MAGNESIUM SULFATE IMPAIRS PLATELET FUNCTION IN NORMAL PREGNANT WOMEN. M. Hallak, J. Martinez-Poyer, L. Brush*, K. Poole-Bryant*, E.F. Mannmen*, Y. Sorokin. Division of MFM, Dept. of Ob/Gyn, Wayne State University School of Medicine, Detroit, MI.

OBJECTIVE: To determine whether magnesium sulfate (MgSO4) affects platelet count and/or function in normal pregnant women.

STUDY DESIGN: Normal, healthy, non-laboring pregnant patients at >30 weeks gestation were recruited. After blood sampling and 800 kcal meal, patients were randomized into study (MgSO4) and control (saline) groups. Unlabeled IV bags with MgSO4 or saline were prepared by a pharmacist. A loading dose of intravenous MgSO4 of saline was followed by a maintenance dose of 2 g/hr IV drip for 3 hours. Maternal blood was drawn at 0, 1 and 3 hours after starting infusion for serum levels, platelet count, and coagulation studies. Maximum platelet aggregation and ATP release in whole blood were evaluated in response to collagen (main platelet agonist and adherent substrate), ATP (an occurring agonist), and arachidonic acid (AA; impact of cyclooxygenase pathway). ANOVA and Student t test applied.

RESULTS: Magnesium prolonged platelet aggregation and release (table). No change in platelet count and no impact of AA were seen. MgSO4 levels were elevated at 1 and 3 hours in the study group only.

<table>
<thead>
<tr>
<th></th>
<th>Saline (n=19)</th>
<th>MgSO4 (n=17)</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of baseline</td>
<td>1 hour</td>
<td>3 hours</td>
</tr>
<tr>
<td>Aggregation:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collagen</td>
<td>103 ± 32</td>
<td>108 ± 22</td>
</tr>
<tr>
<td>ADP</td>
<td>132 ± 98</td>
<td>132 ± 99</td>
</tr>
<tr>
<td>ATP Release:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collagen</td>
<td>115 ± 69</td>
<td>126 ± 66</td>
</tr>
<tr>
<td>ADP</td>
<td>127 ± 63</td>
<td>109 ± 95</td>
</tr>
</tbody>
</table>

CONCLUSIONS: Prolonged administration of MgSO4 was significantly associated with decreased platelet aggregation and release. This mechanism might be the factor for the reported increased bleeding time with MgSO4.


OBJECTIVE: To determine the electrophysiologic effects of intravenously administered magnesium sulfate (MgSO4) in normal pregnant patients.

STUDY DESIGN: 35 normal, non-laboring volunteers with singletons pregnancies > 30 weeks gestation were recruited in the second half of a fasting state and received a standardized 800 kcal mixed single meal after the baseline blood samples were obtained. Patients were then randomized to receive a loading dose of either normal saline or MgSO4 (6 gms bolus followed by 2 gms/hr intravenous maintenance infusion) for three hours in unlabeled IV bags. Blood was drawn at both the start and the conclusion of the study. Serum measurements of magnesium, calcium, and electrolytes were performed. Twelve-lead electrocardiograms at rest were recorded at a paper speed of 25 mm per second ( Hewlett-Packard 1246B) before and after 3 hours of the infusion. Electrophysiologic measurements were computer generated and included heart rate (HR), atrioventricular conduction time (PR), intraventricular conduction time (QRS), ventricular repolarization (QT), and QT interval corrected for heart rate (QTc). Statistical analysis was performed using the paired Student’s t test.

RESULTS: 16 patients were randomized to saline and 16 to MgSO4. No differences attributable to demographic parameters or serum measurements were observed between the two groups. Serum ionized MgSO4 levels increased significantly from 1.2 ± 0.2 (baseline), to 2.2 ± 0.43 in the MgSO4 group. The QTC was significantly prolonged from 420 ± 18 to 442 ± 24 msec (p = 0.005) after administration of MgSO4. Six out of 16 patients in the MgSO4 group had clinically significant prolongation of the QTC (QTC > 450 msec), compared to only 1 patient in the saline group (p = 0.001).

TRIGLYCERIDES: MgSO4 prolongs ventricular repolarization in pregnant patients. Given the known association between prolonged QTC and sudden death in adults and in neonates (Sudden Infant Death Syndrome), the clinical significance of this finding in fetuses deserves further investigation.


OBJECTIVE: To assess the effect of magnesium sulfate (MgSO4) on serum glucose and insulin levels in normal pregnant women.

STUDY DESIGN: 35 normal pregnant women with singleton pregnancies > 30 week gestation were recruited. Patients came in the morning in a fasting state and the baseline blood sample was collected, followed by a specialized 800 kcal mixed meal. Patients were then randomized to receive loading doses and maintenance infusions of either normal saline or MgSO4 (6 gm bolus and 2 gm/hr intravenous maintenance infusion) for three hours in unlabeled IV bags. Blood was subsequently drawn at 1 hour and 3 hours of the infusion. Serum measurement of glucose, insulin, and ionized magnesium were performed on all samples at serum glucose level was measured twice. Total magnesium and serum insulin was determined by radioimmunoassay. Statistical analysis was performed using the SPSS statistical package. Differences between the study periods were expressed as percent change from baseline values. Two-way ANOVA was used to compare differences between groups.

RESULTS: Nineteen patients were randomized to saline and 16 to MgSO4. Mean maternal age, gestational age, height and weight were: 23.3 years (range 17-41), 34.6 weeks (range 30.1-38.6), 64.2 inches (range 60-68), and 78.6 kg (range 56-104). No differences attributable to demographic parameters were observed between the saline and the MgSO4 groups. Ionized magnesium was significantly increased in the MgSO4 group at 1 and 3 hours (p < 0.0001). In the saline group, both glucose and insulin levels were significantly elevated at 1 hour (p = 0.001) compared to levels at 0 and 3 hours in the saline group, and a consistent trend to levels in the MgSO4 group. In contrast, there were significant changes at 1 or 3 hours in the glucose and insulin levels of the MgSO4 group.

The mechanism for the reported increased bleeding time with MgSO4 is currently under investigation.

CONCLUSIONS: Following a standardized meal, MgSO4 infusion markedly attenuates postprandial insulin and glucose levels. This effect may be attributable to a direct stimulation of hepatic glucose uptake.

497 FETAL HEPATIC DYSFUNCTION IS MORE PRONOUNCED IN RH COMPARED TO KELL ALLOIMMUNIZATION. S.C. Blackwell*, H.M. Wolff, S.S. Hassan*, J. Martinez-Poyer, C.A. Carreno*, S.M. Berry. Division of Maternal Fetal Medicine, Dept. of Ob/Gyn, Wayne State University/Hutzel Hospital, Detroit, MI.

OBJECTIVE: The mechanism of fetal anemia in the Kell sensitized pregnant differs from that of Rh disease. Our aim was to investigate the relationship between the type of alloimmunization and markers of hepatic dysfunction in the fetus. The characterization of this relationship may improve our understanding of the pathophysiologic mechanisms underlying the hemolytic process.

STUDY DESIGN: Cordocentesis data collected between 1990 and 1998 from pregnancies complicated by Kell or Rh disease was analyzed. All fetuses studied were antigen positive for the corresponding maternal antibody. Data were obtained exclusively from fetuses who had not received a prior transfusion. The study population was divided according to the type of alloimmunization. Gestational age adjusted values were calculated for fetal hemoglobin, reticulocyte count, AST, ALT, albumin, and total protein by subtracting the mean value for gestational age from the observed (transformation). Separate regression analyses examined the relationship between AST reticulocyte count and AST, ALT, and albumin levels. Differences between the study groups were evaluated using the Kruskal-Wallis test.

RESULTS: A total of 8 Kell sensitized and 58 Rh sensitized pregnancies. No correlation was found between AST, ALT, and albumin and maternal hemoglobin levels in either group. Albumin levels were positively correlated with AST and ALT levels in Rh sensitized fetuses. A high correlation was found between AST, ALT, and albumin levels in Kell sensitized pregnancies.

CONCLUSIONS: Our data suggest a pattern of liver dysfunction characterized by a decrease in albumin production which parallels the severity of anemia in Rh affected fetuses. This finding did not appear to exist in fetuses with anemia due to Kell. Although evidence of hepatic damage was present in both groups, transaminase levels did not correlate with the level of anemia. The mechanism of immune hydrops due to Kell sensitization may involve factors other than hypoalbuminemia from hepatic dysfunction.
USE OF ULTRASOUND GUIDANCE FOR PLACEMENT OF PULMONARY ARTERY CATHETER IN PREGNANT WOMEN. J Martinez, B.A. Mason, J.E. Whitty, Department of Obstetrics and Gynecology, Wayne State University/Hutzel Hospital, Detroit, Michigan.

OBJECTIVE: While the pulmonary artery catheter (PA CATH) may be a very useful adjunct in the management of the critically ill gravid, its use has been frequently questioned in part due to the risk of severe complications during placement. Our purpose was to report on an easy, real-time ultrasound guided technique for both central venous cannulation and continuous visual guidance of transcatheter passage of PA CATHs during right-heart catheterization in pregnant women.

STUDY DESIGN: Right-heart catheterization was performed in three patients for maternal indications. In each patient an ultrasound system (AUSON 128 XP) equipped with a high frequency (7.5 MHz) phased-array transducer was used to facilitate needle and guidewire insertion under direct visualization. The free-hand technique used was previously employed for amniocentesis/fetal blood sampling. A low frequency, 3 MHz sector-mechanical probe was subsequently utilized to obtain an apical four-chamber view of the maternal heart in order to guide the passage of the PA CATH through the superior vena cava, right atrium, and right ventricle. Placement of the transducer in the parasternal area was then used to follow the advancement of the PA CATH into the pulmonary artery.

RESULTS: This technique allowed a smooth, fast and uncomplicated placement of PA CATHs in pregnant women under direct visualization without exposing mother or fetus to ionizing radiation (fluoroscopy). Only limited knowledge of echocardiographic technique was required for the identification of the cardiac valves.

CONCLUSION: Placement of PA CATHs is an invasive technique which presents operators who do not routinely perform these procedures with potentially serious complications such as hematomas, pneumothorax, major hemorrhage, cardiac, pulmonary, or vascular injury. Only limited knowledge of echocardiographic techniques is required for the identification of the cardiac valves.

In summary, the use of ultrasonic guidance for the placement of PA CATHs combined with a reduction in maternal hemorrhage, maternal and fetal radiation exposure, without exposing mother or fetus to ionizing radiation (fluoroscopy), allowed smooth, fast and uncomplicated placement of PA CATHs in pregnant women under direct visualization without exposing mother or fetus to ionizing radiation (fluoroscopy). Only limited knowledge of echocardiographic technique was required for the identification of the cardiac valves.

DOES THE RATE OF FETAL GROWTH DECREASE IN THE POST-TERM PREGNANCY? Dixon MY, Kublikciks M, O'Reilly-Green C, Westgren M, Lenox Hill Hospital, Albert Einstein College of Medicine, Huddinge Hospital of the Karolinska Institute.

OBJECTIVES: Previous studies of human fetal growth suggest that when gestational age (GA) at delivery is determined by the last menstrual period (LMP), fetal weight gain is curvilinear beyond 37 weeks' gestation with progressively decreasing rates of growth as gestation advances. Our aim was to identify the shape of the function relating birth weight (BW) to GA at delivery in a large cohort of patients whose dates have been established by sonography.

MATERIALS AND METHODS: We examined the BW and GA at delivery in consecutive singleton pregnancies who spontaneously delivered at 36.0 to 43.4 weeks' gestation and whose dates were established by an early, second trimester ultrasound exam (i.e., <16 weeks). Pregnancies resulting in intrauterine fetal demise were excluded. Statistical analyses included linear and non-linear curve fitting. Discontinuous regression models were used to identify potential breakpoints in the function relating BW to GA. Separate analyses were conducted for male and female infants, as well as for multiparous and multiparous women.

RESULTS: 3,485 singleton pregnancies were included in this cross-sectional study (1,385 multiparous and 2,099 multiparous patients delivering 1,709 males and 1,775 females neonates). The relationship between BW and GA at delivery was best described by a linear equation (BW (gms) = -4054 + 27.0 GA (days)) (r² = .47, p<0.0001). With males having a significantly higher daily growth rate then females (28.0 vs. 25.4 gms, respectively, p<0.04) and multiparous women having a slight but insignificantly increased growth rate compared to nulliparous women (27.8 vs. 26.4 gms, respectively, p=0.28). No discontinuity or break points were identified in this function.

CONCLUSIONS: In contrast to older studies which suggested that the rate of fetal growth at term and beyond progressively decreases, the present results suggest that when gestational age at delivery is established by early sonography, fetal growth rate at and beyond term is linear (i.e., steady) with a mean growth of 27 grams/day.

500 MATERNAL AND FETAL CAUSES OF ELEVATED NUCLEATED RED BLOOD CELL (NRBC) COUNTS. Minors, V.K.,* Shatzkin, E.S., Dixon, M.V. Depts of Ob/Gyn and Neonatology, Albert Einstein College of Medicine, Lenox Hill Hospital and Long Island Jewish Medical Center, NY.

OBJECTIVE: Recent studies suggest that NRBC counts have an independent role in predicting short and long term perinatal outcome, however, a paucity of data exists regarding the etiology of elevated neonatal NRBC counts at birth. Previous studies have reported that elevated NRBC counts are found in diabetic pregnancies, multiple gestations, prematurity, growth restriction and in cases of fetal asphyxia. We sought to identify maternal and fetal parameters associated with elevated NRBC counts in neonates admitted to the NICU.

STUDY DESIGN: Sixty-five maternal and fetal variables were prospectively abstracted in 324 consecutive NICU admissions during a 12 month period (1997). All inborn neonates with a CBC drawn within the first 4 days of life were included in the study (n=245). Statistical analysis included chi square, ANOVA, simple and stepwise regression.

RESULTS: Elevated neonatal NRBC counts were found to be associated with maternal chronic hypertension (p<0.0001) and pre-eclampsia (p=0.0005). The spontaneous onset of labor (p=0.0001) or a vaginal delivery (p=0.0003) were associated with lower NRBC counts. Maternal diabetes (IDDM, NIDDM or GDM), asthma, race, smoking status, drug use, ABO group, pitocin administration or chorionicamionitis were not associated with NRBC counts. A premature gestational age at delivery (p<0.01), fetal growth restriction (p<0.04), non-reactive NST within 3 days of delivery (p=0.0003) and operative delivery for fetal distress (p=0.0001) were independently associated with higher NRBC counts. APgar scores, the presence of meconium, rhesus sensitization, multiple gestation, fetal cardiac, chromosomal or anatomic anomalies, or anemic fluid index did not correlate with NRBC counts.

CONCLUSION: Our results are consistent with previous studies which have demonstrated that an elevation of the neonatal NRBC count is associated with conditions such as chronic hypertension, pre-eclampsia and fetal growth restriction. However, our results do not confirm previous suggestions that the spontaneous onset of labor, multiple gestation or diabetes during pregnancy are independently associated with elevated NRBC counts.

501 EFFECT OF INDOMETHACIN ON UTERINE BLOOD FLOW IN CHRONICALLY ESTROGENIZED NONPREGNANT EWES IN VIVO. C.P. Mirabile, G.A. Massman, J.P. Fig ueroa. Dept of Obstet and Gynecol Bowman Gray School of Med., Winston-Salem, NC.

OBJECTIVE: Bolus administration of eanoid (E2) markedly increases uterine blood flow (UBF) in the ovarioctomized nonpregnant ewe. Following a 30 min latency, peak flow occurs at 120 min. The mechanisms involved are not fully understood. Studies have confirmed a role for nitric oxide and excluded the involvement of prostaglandins (PG) in this process. PG, however, i.e., PGL, participate in the maintenance of UBF in pregnancy. The aim of the present study was to evaluate the effect of indomethacin (INDO) on UBF in chronically estrogenized nonpregnant ewes in vivo.

STUDY DESIGN: Eight estrus synchronized nonpregnant ewes underwent laparotomy under general halothane anesthesia with subsequent ovarioectomy, intrauterine catheterization and placement of Transonic® flow probe around the common uterine artery. At least 5 days post surgery, 1P-estadiol was administered as a continuous IV infusion (100 μg/d). INDO (mg/kg/h) was administered on days 3 (n=4) or 5 (n=4) as a 2h continuous infusion. Blood pressure and UBF were continuously recorded. Data are expressed as % reduction in mean flow ± SEM. Significance was determined by One Way ANOVA and Dunnett's test.

RESULTS: INDO infusion resulted in a significant reduction in UBF at days 3 and 5 of E2. Data are therefore pooled. Due to flow probe malfunction we only report data from 6 ewes. UBF ranged from 150-250 ml/min.

CONCLUSIONS: Our results indicate that PG synthesis, like NOS activity, is essential for the maintenance of UBF in the chronically estrogenized nonpregnant ewe. These findings contrast reported PG involvement with acute E3 infusion. Paradigms using chronic estrogen administration may therefore be more appropriate in evaluating UBF in pregnancy. HD 32524
502 AUTONOMIC DYSFUNCTION IN PREECLAMPSIA. J. Leduc, D. Rinfret, Dept. Ob-Gyn, Sac-Justine Hospital, Université de Montréal. Québec, Canada.

PURPOSE: To document the autonomic control of the heart rate (HR) and blood pressure (BP) in preeclampsia (PE).

STUDY DESIGN: Ambulatory BP (mm Hg), HR and continuous R-R intervals (ms) (Holter/AMP model AM 5600) were monitored in 14 normotensive non-pregnant women (NP) (27.8±6.7 yrs), in 25 normotensive pregnant women (P) (31.3±5.1 yos. and 29.9±1.0 wks), in 14 chronically hypertensive on no medication (HTA) (31.1±3.5 yos. and 24.2±1.1 wks) and in 5 severe PE (29.0±7.4, and 31.1±3.6 wks). A period of 2 min in the morning with the patient at rest in the supine position and again at 24 h.m. and the patient at sleep were selected for analyses of the R-R. The standard deviation (SD) of the R-R intervals was calculated and defined the overall variability of the HR. The maximum minus the minimum values of the R-R intervals represented the maximal dispersion of the HR. A factorial ANOVA was performed for the diurnal and nocturnal periods with p < 0.001.

RESULTS: In women with PE, we observed: 1) A blunted fall in nocturnal BP and HR; 2) A loss of circadian rhythm of BP. 3) An increased variability of HR.

CONCLUSIONS: Autonomic control of the HR and BP are disturbed in PE.

503 A ROLE OF TUMOR NECROSIS FACTOR AND ITS SOLUBLE RECEPTORS IN SPONTANEOUS PREMATURE Rupture of Membranes at Term. E. Maymona, P. Piacr4a, S.S. Edwinb, R. Romero, M. Mazod, B.H. Yoonb, R. Romero, Perinatology Research Branch, NICHD/NIH, Bethesda, MD and the Department of Obstetrics and Gynecology, Wayne State University, Detroit, MI.

OBJECTIVE: Tumor necrosis factor alpha (TNFa) has been implicated in the mechanisms responsible for preterm premature rupture of membranes (PROM). TNFa induces amnion cell proliferation, induces pro-inflammatory cell death (apoptosis) and the production of enzymes which degrade extracellular matrix. The actions of TNFa are exerted through interaction with two receptors which lead to distinct biological effects: TNF-R1 induces apoptosis while TNF-R2 leads to cell proliferation through the induction of "survival genes". Shedding of TNF-R soluble receptors appears to play a role in the regulation of TNFa's biological functions. The purpose of this study was to determine if spontaneous PROM at term without intraamniotic infection is associated with changes in the amniotic fluid (AF) concentrations of TNFa and the soluble forms of TNF-R1 and TNF-R2.

STUDY DESIGN: AF samples from 193 pregnant women were assayed for MMP-1, TIMP-1, MMP-2 and TIMP-2 concentrations determined by sensitive and specific enzyme-linked immunosassay. The MMP-9/TIMP-1 and TIMP-2/TIMP-1 molar ratios were calculated. A paired t test was used for analysis.

RESULTS: 1) Concentrations of MMP-9 and MMP-9/TIMP-1 ratio were higher in fluid from the "forebag" compartment than the "upper" uterine compartment. 2) In contrast, no differences were detected in MMP-2, TIMP-2. However, MMP-2/TIMP-2 ratio was significantly different. The table belows displays the means, SDs and p values.

<table>
<thead>
<tr>
<th>MMP-9 (ng/ml)</th>
<th>MMP-9/TIMP-1</th>
<th>TIMP-2 (ng/ml)</th>
<th>TIMP-2/TIMP-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>NP day</td>
<td>0.076±0.057</td>
<td>513±138</td>
<td></td>
</tr>
<tr>
<td>night</td>
<td>0.090±0.045</td>
<td>424±178</td>
<td></td>
</tr>
<tr>
<td>P day</td>
<td>0.046±0.013</td>
<td>247±0.699</td>
<td></td>
</tr>
<tr>
<td>night</td>
<td>0.071±0.031</td>
<td>406±2.092</td>
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</tr>
<tr>
<td>PE day</td>
<td>0.044±0.022</td>
<td>448±4.618</td>
<td></td>
</tr>
<tr>
<td>night</td>
<td>0.065±0.035</td>
<td>591±5.183</td>
<td></td>
</tr>
<tr>
<td>HTA day</td>
<td>0.047±0.029</td>
<td>271±1.100</td>
<td></td>
</tr>
<tr>
<td>night</td>
<td>0.050±0.028</td>
<td>248±1.575</td>
<td></td>
</tr>
</tbody>
</table>

* day vs. night.  \# P vs PE during the diurnal period.

CONCLUSIONS: There is a topographic difference in the bioavailability of MMPs within the uterine cavity; the higher concentration of MMP-9 and the higher MMP-9/TIMP-1 ratio in fluid bathing the cervical region may explain the development of the ZAM and its prediction for membrane rupture to occur close to the lower pole of the membranes.

504 TOPOGRAPHICAL DIFFERENCES IN THE BIOAVAILABILITY OF Matrix Metalloproteinases within the UTERINE CAVITY: A POSSIBLE MECHANISM FOR THE DEVELOPMENT OF A REGIONAL AREA OF MEMBRANE WEAKNESS PREDISPOSING TO RUPTURE. E. Maymona, S.S. Edwinb, R. Romero, A. Rodriguez, R. Romero, Perinatology Research Branch, NICHD/NIH, Bethesda, MD and the Department of Obstetrics and Gynecology, Wayne State University, Detroit, MI.

OBJECTIVE: The mechanisms responsible for rupture of membranes have not been clearly elucidated. Accumulating evidence supports a role for enzymes which degrade extracellular matrix (matrix metalloproteinases or MMPs) in the pathophysiology of this process in preterm and term gestations. Structural studies have demonstrated the existence of a "zone of altered morphology" (ZAM) in the area of the membranes in close proximity to the cervix (RGC). We hypothesize that topographical differences in the enzymatic bioavailability between the "upper" and the "forebag" uterine compartments explains why and how membrane rupture generally occurs in the most dependent area of the uterine cavity. To test this hypothesis, amniotic fluid (AF) concentrations of MMP-9, MMP-9, and their inhibitors (TIMP-1 and TIMP-2) in the "upper" and "forebag" compartments were determined.

STUDY DESIGN: Paired samples of AF were obtained by translumbar and transabdominal amniocenteses from 14 women in spontaneous labor with intact membranes. MMP-9, TIMP-1, MMP-2 and TIMP-2 concentrations were determined by sensitive and specific enzyme-linked immunosassay. The MMP-9/TIMP-1 and TIMP-2/TIMP-1 molar ratios were calculated. A paired t test was used for analysis.

RESULTS: 1) Concentrations of MMP-9 and MMP-9/TIMP-1 ratio were higher in fluid from the "forebag" compartment than the "upper" uterine compartment. 2) In contrast, no differences were detected in MMP-2, TIMP-2. However, MMP-2/TIMP-2 ratio was significantly different. The table belows displays the means, SDs and p values.

<table>
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<tr>
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<th>MMP-9/TIMP-1</th>
<th>TIMP-2 (ng/ml)</th>
<th>TIMP-2/TIMP-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>forebag comp.</td>
<td>92.8 (129.8)</td>
<td>0.008</td>
<td>722.8 (294.0)</td>
</tr>
<tr>
<td>upper comp.</td>
<td>32.0 (51.5)</td>
<td>0.003</td>
<td>715.3 (136.9)</td>
</tr>
<tr>
<td>p</td>
<td>0.02</td>
<td>0.05</td>
<td>NS</td>
</tr>
</tbody>
</table>

CONCLUSION: 1) There is a topographic difference in the bioavailability of MMPs within the uterine cavity; 2) The higher concentration of MMP-9 and the higher MMP-9/TIMP-1 ratio in fluid bathing the cervical region may explain the development of the ZAM and its prediction for membrane rupture to occur close to the lower pole of the membranes.


BACKGROUND/OBJECTIVE: The obese (ob) gene product, leptin, regulates energy balance and feeding behavior and is expressed abundantly in both adipose tissue and placenta. Plasma leptin concentrations are higher in pregnant women than in nonpregnant women and the levels of this hormone fall to non-pregnant levels shortly after delivery, suggesting that the placenta is a major source for this hormone. Leptin is considered a useful marker for body energy balance and has been implicated in fetal growth and development. The objective of this study was to determine the relationship between amniotic fluid (AF) concentrations of leptin and gestational age, parturition (term and preterm), spontaneous rupture of membranes and intraamniotic infection.

STUDY DESIGN: AF samples from 193 pregnant women were assayed for leptin. Fluid was retrieved from women in the following clinical groups: trimester (n=25), patients in preterm labor (PTL) who delivered a term (n=35), patients with PTL who delivered preterm (n=19) and with intraamniotic infection (n=39). In women at term labor in (n=22) and in labor (n=17). In addition, AF was retrieved in patients with preterm (n=9) and term (n=16) premature rupture of membranes. Leptin was measured using sensitive and specific immunosassays validated for AF. Data was analyzed using non-parametric statistics.

RESULTS: 1) Leptin was detectable in all AF samples; 2) AF leptin concentrations decreased with advancing gestational age (r=0.61, p<0.001); 3) Term parturition was associated with a change in AF leptin concentrations (r=0.57, p<0.01) term labor: median: 3.8 ng/ml; range: 0.7-67.1; term labor: median: 4.1 ng/ml; range: 0.45-6.7; p<0.05, respectively; 4) Intraamniotic infection in PTL was not associated with changes in AF leptin concentrations (PTL with positive AF culture: 4.5 mg/ml range: 1.29-1.3); 5) Rupture of membranes (term or preterm) was not associated with changes in AF leptin concentrations.

CONCLUSION: 1) Leptin is a physiologic constituent of AF; 2) In contrast to what has been observed in maternal plasma, AF concentrations of leptin decrease with advancing gestational age; and 3) Neither parturition nor infection affect AF leptin concentrations.

OBJECTIVE: To determine the impact of fetal growth birthweight (BW) category on the risk of PM (≥28 days) using fetal and neonatal growth standards.

STUDY DESIGN: This was a hospital-based cohort study of consecutive births at St. Joseph’s Hospital, a tertiary care perinatal centre, from 1985 to 1996. Using the computerized perinatal database, 37,377 pregnancies met the following inclusion criteria: (1) singleton, (2) accurate dating, (3) gestational age (GA) 25-40 weeks, (4) no anomaly, and (5) fetal death ≤1 wk of delivery date in cases of stillbirth. Neonates were divided into 5 BW categories: (1) fetal growth restriction (FGR): BW < 3rd perc., (2) borderline FGR (bFGR): BW ≥ 3rd perc. and < 10th perc., (3) normally grown (AGA): BW > 90th perc. and < 97th perc., (4) borderline large for GA (bLGA): BW > 97th perc. and ≤ 99th perc., and (5) LGA: BW > 99th perc. using either Canadian neonatal growth chart (Arbuckle, 1993) or fetal growth chart (Hadlock, 1991). Multiple logistic regression analysis was used to calculate odds ratio (OR) for PM with confidence interval (CI) adjusted for fetal sex, route of delivery, nuchal cord, parity, maternal hypertension, and maternal age. AGA is the reference group.

RESULTS: There were 312 perinatal deaths including 193 stillbirths and 119 neonatal deaths. Neonatal growth chart underestimated the number of perinatal deaths in the FGR group in preterm fetuses (n=48) both not in term FGR group (n=9) when compared with fetal growth chart (n=80 in preterm FGR and n=10 in term FGR).

CONCLUSIONS: Using both fetal and neonatal growth standards, preterm and term FGR fetuses as well as term LGA fetuses are at higher risk of PM than AGA. However, in preterm bFGR fetuses, the risk of PM was dependent on the growth standards used.

509 THE EFFECT OF DELIVERY ON OXYGEN DELIVERY AND CONSUMPTION IN THE RESPIRATORY-COMPROMISED GRAVIDA. Cornelia Greene, M.D., Audrey Kang, M.D., Kathy Coar, M.D., Vanderbilt University School of Medicine, Nashville, TN.

OBJECTIVE: Management of the respiratory-compromised gravida is controversial.

The purpose of this study is to evaluate the effect of delivery on maternal oxygen delivery (DO2) and maternal oxygen consumption (VO2).

STUDY DESIGN: During 1992-1997, 31 patients required intubation for respiratory compromise for more than 24 hours. Of these patients 10 required hemodynamic monitoring with an oximetric pulmonary artery catheter. After optimizing hemodynamic status, values for DO2 and VO2 were obtained prior to delivery, and 12-24 and 48 hours post-delivery. Data collected were analyzed using the t-test and linear regression analysis when appropriate.

RESULTS: The difference between pre and post delivery DO2 was not significant (p=0.63). There was also no difference in VO2 (p=0.60). As expected there was a correlation between the change in DO2 as related to VO2 (p=0.08).

CONCLUSIONS: Oxygen delivery and oxygen consumption were not significantly changed by the delivery of the fetus. This suggest that the decision for delivery in this group of patients should be based on obstetric indications.
510 A NOVEL 2 KB GENE EXPRESSED FROM HUMAN FETAL 1ST TRIMESTER CHORIONIC VILLI. J. La*, T. Morgan*, K. Ward. Dept. of Ob/Gyn, Univ. of Utah, Salt Lake City, UT.

OBJECTIVE: Little is known about the genetic control of the growth and differentiation of early human gestational tissues. We hypothesize that since this tissue is relatively understudied, novel genes regulating critical processes during early placentation can be found in 1st trimester chorionic villi. Our objective was to isolate and characterize novel genes expressed in first trimester human chorionic villi.

STUDY DESIGN: Chorionic villi were collected from 1st trimester elective abortions. Total RNA was extracted, messenger RNA was isolated, and complementary DNA (cDNA) was synthesized. cDNA was cloned. Automated sequencing of random clones was done. A BLAST search was performed on NCBI Genbank. If no homology was identified, the complete cDNA was sequenced. To determine levels and patterns of expression, RNA probes were synthesized by in vitro transcription for Northern analysis.

RESULTS: Seventeen of 186 random clones did not have homology with known genes and may be novel genes. One of the clones from a 8 week gestation cDNA library is a 2 kb gene abundantly expressed in human fetal villi, brain, lung, liver, and kidney.

CONCLUSIONS: These seventeen clones may be novel genes involved in early first trimester placenta. The first gene to be characterized is expressed in abundance by fetal tissues and may have a role in early human fetal development.

511 CENTRAL HEMODYNAMIC EFFECTS OF AN OXYTOCIN RECEPTOR ANTAGONIST (ATOSIBAN) IN THE ISOLATED PERFUSED RAT HEART. J Thorp, D Maves*. Dept. of Ob/Gyn and Anesthesiology, Univ. of North Carolina, Chapel Hill, NC.

OBJECTIVE: Oxytocin stimulates uterine contractility. Atosiban is a selective oxytocin receptor antagonist capable of inhibiting oxytocin-induced contractility of the uterus. Trials of this agent in intact animals and women as a tocolytic agent for preterm labor have shown atosiban to be devoid of cardiac effects. This is in contrast to other tocolytic agents which have profound hemodynamic activity. We conducted this study to determine the cardiac effects of atosiban in the isolated, perfused rat heart model.

STUDY DESIGN: Hearts were excised from sixty female Sprague-Dawley rats and attached to a Langendorff apparatus. Left ventricular systolic pressure, heart rate, and contractility were measured. Hearts from half of the animals were exposed serially to 300 mcg/min, 600 mcg/min, and 1200 mcg/min of atosiban. The remaining hearts formed the control group and were exposed to aerated Krebs solution.

RESULTS: There were no significant differences between hearts exposed to atosiban and hearts within the control group for heart rate, left ventricular systolic pressure, and contractility. P values ranged from 0.12 to 0.73.

CONCLUSIONS: Using a classic physiologic model to study cardiac performance and drug effects, we were unable to detect any central hemodynamic action of atosiban. This is in contrast to oxytocin, which we previously studied and found negative chronotropic and positive ionotropic effects.


OBJECTIVE: Administration of interferon (IFN) α to young children has been followed by the development of spastic diplegia, a form of CP. We explored the association of IFNs in neonatal blood with presence of CP and other inflammatory mediators recently shown to distinguish children with CP from control neonates.

STUDY DESIGN: Archived neonatal heelstick blood of 31 children with spastic CP, mostly term infants without recognized syndromes, and 65 controls, was assayed by recycling immunoaffinity chromatography with laser-enhanced fluorescence and chemiluminescence detection.

RESULTS: 14 of 31 children with CP had neonatal levels of IFN-α, β, and γ that exceeded any control. Concentrations of interleukins-1, 6, 8, TNFα, chemokines, colony stimulating factors, TGFβ, complement elements and regulators, neuropeptides, and thyroid hormones also differed from controls in these 14 children. The four children born to clinically infected women were in this group. In the 17 children with CP whose IFN levels were within the range for controls, levels of inflammatory cytokines were higher than, but near to, control values.

CONCLUSION: Neonatal concentrations of IFNs identified two levels of expression of a spectrum of inflammatory mediators in children with CP suggesting at least two pathways to CP.


OBJECTIVE: To examine the association of antiphospholipid antibodies (aPL) and abnormalities of coagulation factors with presence of CP.

STUDY DESIGN: Dried neonatal heelstick blood from 31 children with spastic CP, mostly born at term, and 65 controls were studied by capillary electrophoresis or recycling immunoaffinity chromatography. We used recursive partitioning to determine values that best discriminated between cases and controls.

RESULTS: Lupus anticoagulant (IgG) or anticardiolipin antibodies at both were present in a titer of 1:100 or greater in 4 of 31 children with CP and none of 65 controls. Antibody to the translational product of the factor V Leiden mutation exceeded 11 µg/mL in 8 children with CP, 1 control.

Antithrombin III antibody levels above 51 mg/dL were present in 3 children with CP and no control, total concentration of protein C above 117% or protein S above 130% or both in 12 children with CP and 1 control. In all, 20 children with CP and 2 controls had at least one of these factors. Twelve children with CP and no control had an aPL or 2 or more other coagulation factors that exceeded control values.

CONCLUSION: Antiphospholipid antibodies or coagulation factor exceeding control values were observed frequently in neonatal blood in the selected series of children with CP. Recognition of such abnormalities may provide clues to the etiology of CP in some children.
514 RIGHT AND LEFT ATRIAL PO2 AND PCO2 IN HUMAN FETUSES. 

OBJECTIVE: To measure the right and left atrial blood gases in normal human fetuses and in fetuses with nonimmune hydrops.

STUDY DESIGN: With the approval of a special committee, 10 normal fetuses and 6 fetuses with nonimmune hydrops undergoing late termination of pregnancy between 23-25 weeks gestation for fetal or maternal indications were studied, after obtaining maternal informed consent. The procedure included intracardiac injection of Potassium Chloride (KCl) 1% to avoid a delivery of a live born and intra-amniotic installation of prostaglandin (PG) F2 alpha to induce labor. Right and left atrial blood samples were obtained after the injection of KCl.

RESULTS: The right and left atrial PO2 obtained in normal fetuses ranged from 43.2 - 52.7 (mean+SD, 45.9±4.9 mmHg), and 34.2 - 49.9 (mean+SD, 42.9±3.1 mmHg), respectively. The differences between right and left atrial PO2 and PCO2 were both statistically significant (p<0.001, using paired t-test). The right (51.1±3.1, mmHg) but not the left (32.4±2.4, mmHg) atrial PO2, measured in 6 hydropic fetuses was significantly lower compared with the atrial PO2 measured in normal fetuses (p<0.01, using Mann-Whitney U test). Also the right (50±4.4, mmHg) but not the left (43.7±4.4, mmHg) atrial PCO2 was significantly higher in hydropic fetuses compared with the atrial PCO2 measured in normal fetuses (p<0.01, using Mann-Whitney U test).

CONCLUSIONS: It is possible that in fetuses with nonimmune hydrops the poorly oxygenated right atrial venous blood results from a high oxygen extraction of the hydropic fetal organs. The left atrial venous blood supplied by the ductus venosus remains unaffected by this situation.


OBJECTIVE: Given the inadequacy of single risk factors, we evaluated the utility of multivariate analysis in the prediction of shoulder dystocia.

STUDY DESIGN: 100 consecutive patients with shoulder dystocia were matched in a case-control comparison with 100 controls without shoulder dystocia. All patients had vaginal delivery at term between 12/91 and 5/97. Variables associated with shoulder dystocia and included in the formula were: birth weight (BW), 1 hr glucose (GLU) and umbilical cord pH (OVD). A formula based on the regression coefficients for the identified factors was then used to calculate a composite score from which ROC curves were derived.

RESULTS: With multivariate analysis birth weight (BW), 1 hr glucose (GLU), operative vaginal delivery (OVD), and height of fundus (HOF) were independently related to shoulder dystocia. The sensitivity and specificity reached 84% and 95%, respectively with BW + GLU + OVD. Results remained significant even after OVD was removed from the equation. Significant associations remained when HOF and carbohydrate intolerance (not shown) were substituted for BW and GLU respectively.

CONCLUSIONS: Shoulder dystocia is independently associated with BW, GLU, and OVD, and can be predicted with clinically acceptable accuracy using multiple variables. This model may be useful in the design of prospective studies for managing suspected macrosomia.

516 ALTITUDE REDUCES AND PREGNANCY INCREASES MATERNAL ARTERIAL OXYGEN SATURATION. Diddy GA1, Sullivan CA1, Moore LG2, Richlin SR1, Loucks CA1, Belfort MA1, Clark SL1. Dept of Ob/Gyn: University of Utah Health Sciences Center, Salt Lake City, UT; The Stanford Hospital, Stanford, CA; Women's Health Research Center, University of Colorado Health Sciences Center, Denver.

OBJECTIVE: To evaluate the effects of altitude on maternal arterial blood oxygen saturation measured by pulse oximetry (SpO2) during pregnancy.

MATERIALS AND METHODS: We abstracted maternal SpO2 measurements from our previous studies of women residing at sea level (Richlin SR, ACOG 1998; n=32), at 1400 m (Diddy GA, SGI 1998; n=33), at 3100 m (Moore LG, JA P Physiol 1982; n=27), and 4300 m (Moore LG, J Appl Physiol 1986; n=21) while non-pregnant (*) and at 36 weeks of gestation (*) All SpO2 measurements were taken by transmission pulse oximetry while subjects were sitting and breathing room air.

RESULTS: As altitude increases: (1) maternal SpO2 decreases, both in the third trimester and in the non-pregnant state and (2) the difference between third trimester and non-pregnant SpO2 increases.

CONCLUSIONS: As altitude increases, a greater difference between non-pregnant and third trimester SpO2 is seen, most likely due to increased maternal hypoxic ventilatory responsive nervousness, which increases maternal minute ventilation and arterial oxygen saturation at the steep portion of the O2-hemoglobin dissociation curve. The magnitude of the pregnancy-associated rise in maternal SpO2 is likely important for maternal and fetal well-being.

517 THE EFFECT OF THE NON-PEPTIDE CRH ANTAGONIST CP-154,526 ON THE LENGTH OF GESTATION IN SPRAGUE-DAWLEY RATS. Edward F. Fumas, Aaron Davidson*, & Thomas H. Finlay*. Department of Obstetrics and Gynecology and 2Kaplan Cancer Center, NYU School of Medicine, NY, NY.

OBJECTIVE: In human pregnancy, plasma CRH levels increase dramatically during the last trimester from a mean of 50 pg/ml at 28 weeks gestation to 1462 pg/ml at 40 weeks. Consistent with its placental origin, CRH levels return to non-pregnant levels 15 hours post-delivery. Some investigators have theorized that the length of murine gestation.

STUDY DESIGN: CP 154, 526 was dissolved in 50% DMSO and 0.9% saline. CP 154, 526 was administered intraperitoneally to rats at a dose of 1 mg/kg/day in 6 mg/kg/day increments over a 10 day period. The number of rats delivered in each treatment group was determined by Kaplan-Meier analysis.

RESULTS: The number of rats delivered in each treatment group was determined by Kaplan-Meier analysis. The number of rats delivered in each treatment group was determined by Kaplan-Meier analysis.

CONCLUSIONS: No difference in length of gestation was observed at the dose given. The mean litter and pup weight in the drug and placebo groups were similar (57.0 g, 5.8 g vs. 60.1 g, 5.9 g). While the rat placenta does not make CRH itself, both endothelial and decidualized stromal cells of the early pregnant rat uterus contain CRH. Also, the rat blastocyst implantation site produces a 1.3 KB CRH mRNA identical to that of the human placenta. However, because of these differences, it is unclear whether CRH antagonism has no effect on gestational length or if the murine model is unsuitable for study. A study of non-human primates may be necessary.
518 SYMPATHETIC CONTROL OF THE HEART RATE DURING STANDARD CARDIOVASCULAR TESTS IN PREGNANT AND NON-PREGNANT WOMEN. R. Shear, L. Leduc, D. Rinfret. Dept Ob/Gyn, St. Justine Hospital, Université de Montréal, Montréal, Québec, Canada.

OBJECTIVE: To document the sympathetic control of the heart rate during pregnancy with noninvasive cardiovascular tests.

STUDY DESIGN: Ambulatory blood pressure monitoring, heart rate and continuous R-R intervals (msc) (Holter/ambulatory blood pressure, AMP model AM 5600) were measured in 20 normotensive pregnant women (mean maternal and gestational age: 31.8 ± 3.5 y.o. 25.0 ± 1.1 weeks) and 16 normotensive nonpregnant women (mean age 26.6 ± 5.2 years) during standard cardiovascular tests: the Valsalva maneuver, a mental arithmetic test and a public speech. During the Valsalva maneuver, stroke volume and the systolic and pulse pressures fall. This leads to a cardiac baroreflex-tachycardia. The standard deviation (SD) of the R-R intervals was calculated and defined the overall variability of the heart rate, measured in the supine position. The tachycardia ratio (the shortest R-R interval during the strain to the mean R-R interval 30sec before the strain) was calculated for each test and documented sympathetic activity. An ANOVA test for pregnant vs. nonpregnant women was performed with a p<0.05. Resting heart rate was used as a covariate to document the influence on the magnitude of response.

RESULTS:

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<th>Pregnant</th>
<th>Nonpregnant</th>
<th>p</th>
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<tbody>
<tr>
<td>Arithmetic</td>
<td>0.82±0.13</td>
<td>0.73±0.08</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Valsalva</td>
<td>0.85±0.05</td>
<td>0.76±0.08</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Speech</td>
<td>0.84±0.04</td>
<td>0.76±0.06</td>
<td>&lt;0.001</td>
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<tr>
<td>SD supine</td>
<td>0.05±0.02</td>
<td>0.07±0.03</td>
<td>&lt;0.001</td>
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CONCLUSION: The sympathetic responses are attenuated in mid-pregnancy. The increase in plasma volume during pregnancy may partially account for this attenuation.


OBJECTIVE: To investigate the use of umbilical cord bilirubin levels to predict neonatal hyperbilirubinemia in the term infant.

STUDY DESIGN: For each mother-fetus pair, 3 cc of maternal blood was collected into a light-shielded serum separator tube on admission. After delivery, umbilical cord blood samples were collected into light-shielded serum separator tubes and were sent to an in-hospital lab for immediate serum total bilirubin levels were determined using Boehringer-serum separator tubes and were sent to an in-hospital lab for immediate processing. Exclusion criteria included gestation < 37 weeks, fetal hemolytic disease, fetal maturity, neonatal total bilirubin testing was required in 10 infants. The presence and magnitude of response difference in the maternal bilirubin values between the groups.

RESULTS: Forty mother-fetus pairs were obtained. The mean gestational age was 40 weeks. Neonatal total bilirubin testing was required in 10 infants. The positive predictive value of umbilical cord bilirubin levels for predicting neonatal hyperbilirubinemia was 56%, while the negative predictive value was 96%. There was no statistically significant difference in the maternal bilirubin values between the groups.

CONCLUSION: An umbilical vein total bilirubin level of < 2.1 was predictive of neonates who did not require evaluation for hyper-bilirubinemia. The routine collection of umbilical cord total bilirubin levels may provide an efficient and painless method for identifying neonates at low risk for neonatal hyperbilirubinemia prior to early discharge from the hospital.

520 FREQUENCY DOMAIN OPTICAL MONITORING OF EXPERIMENTAL BRAIN HEMORRHAGE IN NEWBORN PIGLETS. MR Stankoski, D. Huerbe, D. Mauilik, W. Rosenfeldt, MA Franceschini, S. Fantini, D. Wallace, PG Stubblefield. Ob/Gyn & Pediatrics, Winthrop University Hospital, NY; Dept. Physio, University of IL & ISS Inc. Urbana-Champaign, IL; OB/Gyn, Boston University, Boston, MA.

OBJECTIVE: Intraventricular hemorrhage (IVH) is a major cause of perinatal neurological morbidity in premature infants. Our objective was to use the neonatal piglet model of brain hemorrhage to assess the qualitative and quantitative properties of near infrared optical monitoring.

STUDY DESIGN: Ten anesthetized, instrumented, and ventilated newborn piglets were subjected to A) subcortical (n=5), and B) intraventricular (n=5) brain injections of 1 - 2 cc of autologous blood. Optical monitoring was performed with an ISS tissue oximeter (ISS Inc., Champaign, IL) that uses 110 MHz modulated light at two NIR wavelengths (752 and 830 nm). A custom-made optical probe (held by a stereotaxic frame) was applied to the scalp at the injection site (left frontal region). Pathology served to validate optical data.

RESULTS: The detection limit of 0.010 ml of injected blood was identified for both groups. For subcortical hematomas, the detection sensitivity increased with the increasing volume, being linear with the surface or cross sectional area of the hematoma rather than with the quantity of the injected blood. The ability of the system to quantify the amount of injected blood was limited to subcortical hematomas, with decreasing sensitivity to small injections once the total of all injections was large. In case of intraventricular blood injections, as the solid hematoma did not form, the monitor could detect the disseminated blood (through the ventricular system) even in the contralateral brain hemisphere.

CONCLUSION: Monitoring of cerebral hemodynamics and oxygenation, and the detection of germinal matrix – IVH, would be important steps towards the prevention of perinatal brain injury. Past attempts to detect IVH using NIR light have been hampered by the incapability of the NIR instruments to quantitate, i.e. to tell the difference between normal and abnormal brain. However, the most recent innovations in technology support the possibility of developing new tools to make these measurements. We demonstrate that frequency domain optical monitoring can: 1) detect the minute amounts of intracranial blood, and 2) distinguish subcortical hematomas from IVH.

521 OPTICAL IMAGING OF EXPERIMENTAL BRAIN HEMORRHAGE IN THE NEONATAL PIGLETS. MR Stankoski, S. Fantini, D. Mauilik, W. Rosenfeldt, MA Franceschini, D. Huerbe, D. Wallace, PG Stubblefield. Ob/Gyn & Pediatrics, Winthrop University Hospital, NY; Dept. Physio, University of IL & ISS Inc. Urbana-Champaign, IL; OB/Gyn, Boston University, Boston, MA.

OBJECTIVE: Perinatal brain injury could be prevented or ameliorated if the preceding and/or accompanying disturbances in cerebral hemodynamics and oxygenation could be monitored. Our objective was to use the optical brain imaging (OBI) to study cerebrovascular pathophysiology accompanying experimental brain hemorrhage. OBI is based on the unique property of near infrared light to non-invasively penetrate through the intact scalp and skull and provide information on brain hemoglobin concentrations, i.e. perfusion and oxygenation.

STUDY DESIGN: Nine anesthetized, instrumented, and instrumented newborn piglets underwent left subcortical injection of 2 cc of autologous blood. The images were acquired continuously in 7 piglets, every 160 ms, with the prototype ISS optical imager, and a custom 3.5 cm x 3.5 cm optical probe containing 2 light detectors. The images were acquired continuously in 7 piglets, every 160 ms, with the prototype ISS optical imager, and a custom 3.5 cm x 3.5 cm optical probe containing 2 light detectors and 16 sources (8 for each of the 758 and 830 nm, wavelengths). A stereotaxic instrument was used to assure an optimal optical (probe-to-scalp) coupling and reproducible brain hematomas, as confirmed ex-vivo, by pathology.

RESULTS: The presented images report changes in brain absorption from baseline (Fig 1). Left frontal brain hematoma appeared as an increase in brain absorption (intensity changed by 35.8% for 1 cc, and 65.4% and 2 cc of injected blood) (Fig 2-5), accompanied by the transient contralateral and ipsilateral decrease in absorption (intensity changed by 3.7%, and 12.2% for 1 cc and 2 cc of injected blood) (Fig 2-5), followed by the generalized bilateral increase in absorption (intensity changed by 21.5% 90s, and 38.9% and 180s) (Fig 4-5).

CONCLUSIONS: OBI readily detected brain hematomas and accompanying splatalateral and contralateral cerebrovascular changes, i.e., transient brain ischemia due to a rise in intracranial pressure (Fig 5) followed by reperfusion and hyperemia (Fig 4-5), with reasonably good spatial, and high temporal resolution.
522 POLYAROMATIC HYDROCARBONS CAUSE INTRAUTERINE GROWTH RESTRICTION AND ALTER FETAL PULMONARY DEVELOPMENT. C.A. Albuquerque, F. Royce, K. Stephens, W.M. Gilbert and K.E. Pinkerton. Dept. of OB/GYN, Dept. of Pediatrics and Institute of Toxicology and Environmental Health, Univ. of California, Davis.

OBJECTIVE: Structural maturation of the lungs is influenced by amniotic fluid within the developing airways. Polycyclic hydrocarbons, such as β-naphthoflavone are potent metabolic inducers and affect fetal development. Our aim was to test the hypothesis that maternal administration of β-naphthoflavone, can affect fetal development by alteration of amniotic fluid volume.

STUDY DESIGN: The experimental rats were administered β-naphthoflavone at a dose of 80 mg/kg body weight dissolved in corn oil intraperitoneally 72 and 48 hr prior to the examination. The pups (n=25) were delivered by cesarean section on gestational day 21. The control pups (n=19) were administered corn oil at the same dose and time and similarly delivered. The fetal weight, placental weight and amniotic fluid volume were measured. Morphometric analysis on fetal lungs for assessment of nuclear density and epithelial thickness of the fetal airways were performed.

RESULTS: β-naphthoflavone exposed pregnant rats caused a decrease in amniotic fluid volume at 21 days gestation (0.85 ± 0.14 vs. 1.51 ± 0.17 cc) (P<0.05). The fetal weight was also decreased at 21 days gestation (4.02 ± 0.15 vs. 4.62 ± 0.21 g) (P<0.05). β-naphthoflavone caused a decrease in placent weight compared to control fetuses (1.12 ± 0.22 vs. 1.16 ± 0.1g). Morphometric analysis demonstrated that the mean number of airway epithelial cells per basal lamina length was 18.6 ± 0.8 cells/100μ in exposed compared to 16.7 ± 0.4 cells/100μ in control fetuses (P<0.05).

CONCLUSION: Environmental toxicants such as polycyclic hydrocarbons may affect fetal development by causing (1) intrauterine growth restriction (2) decreased amniotic fluid volume and (3) alteration in airway cellular multiplication.

523 EFFECTS OF INTRAUTERINE GROWTH RESTRICTION ON LUNG LIQUID IN THE OVINE FETUS. C.A. Albuquerque, M.L. Tester, S. Hooper, R. Hardinge. Dept. of OB/GYN, Univ. of California Davis, Davis and Fetal & Neonatal Research Group, Department of Physiology, Monash University, Victoria, Australia.

OBJECTIVE: Intrauterine growth restriction (IUGR) contributes to perinatal mortality and morbidity, and is associated with impaired respiratory function after birth. Structural maturation of the fetal lung is influenced by the lung liquid within the developing airways. Hence, our aim was to evaluate the effects of IUGR on lung liquid in the ovine fetus.

STUDY DESIGN: Pregnant ewes underwent surgery at 116 days post-mating (term ~147d) for implantation of vascular and tracheal catheters in treated (n=5) and control (n=4) fetuses. Placental insufficiency was induced from 120 to 140 days of gestation by daily umbilico-placental embolisation using 40-70 pin microspheres. During embolisation fetal PiH was reduced by 8 mmHg or more below pretreatment PiH, while LLP rate was unchanged from controls (167±64 ml/h vs. 226.4±67.2 ml/h), while LLP rate was unchanged from controls.

RESULTS: Fetal body weight was reduced in treated fetuses (3.3±0.1 kg) compared to controls (5.3±0.1 kg) at 140 days gestation. At 140d LLV was significantly decreased in treated fetuses compared to controls (114±4±19±0 vs. 226.±67.2 ml/h), while LLP rate was unchanged from controls (16±6±22.7±65.5 ml/h). When adjusted for body weight, LLV and LLP in treated fetuses at 140d were not significantly different from control values.

CONCLUSION: IUGR does not significantly affect fetal lung liquid production and volume. We speculate that the secretory function of the fetal lung apparently adapts to chronic hypoxemia and placental insufficiency.

524 BLOOD PRESSURE IS ELEVATED IN NORMOTENSIVE PREGNANT WOMEN WITH INTRAUTERINE GROWTH RETARDATION. Tranquilli AL, Rezai B*, Garbati EY, Valensic HI, Garzetti GG*, Romaniello C. Department of Obstetrics and Gynecology, University of Ancona and Rome-Tor Vergata, Ancona and Rome, Italy.

OBJECTIVE. To assess the relationship between blood pressure pattern and intrauterine growth retardation in normotensive pregnant women.

STUDY DESIGN. Twenty-four-hour automated ambulatory blood pressure monitoring (readings every 30 minute) was performed between 92 and 34 weeks in 139 normotensive, non-proteinuric, primigravidae with intrauterine growth retardation (IUGR) (abdominal circumference lesser than 10th centile at third trimester sonogram) and 140 primigravidae, matched for age and gestation, who were and remained normotensive throughout pregnancy and whose fetuses had regular fetal growth at serial sonograms, who served as controls. From 24h blood pressure report, we calculated 24h average, daytime and nighttime means, that were compare and tested for statistics with t-test; significance assessed at p<0.001.

RESULTS. Although all measures were within the normotensive range, blood pressure of mothers with IUGR were significantly higher than controls. Twenty-four-hour mean, daytime, and nighttime systolic (mean ± SD) were 119.9 ± 11.9, 122.6 ± 11.7, 114.4 ± 13.3 mmHg, in women with IUGR and 108.0 ± 7.4, 109.2 ± 7.3, 102.1 ± 8.5 mmHg, in normal pregnant women. Twenty-four-hour diastolic average, daytime, and nighttime diastolic (mean ± SD) 78.1 ± 9.3, 69 ± 10.6, 67.5 ± 9.0 mmHg, in women with uterine malformations and 64.1 ± 5.7, 66.0 ± 5.7, 58.2 ± 6.3 mmHg, in normal pregnant women. All differences p<0.0001.

CONCLUSIONS. Even in the absence of overt hypertension or preeclampsia, pregnant women with IUGR anomalies have blood pressure higher than normal. Although within clinic normotensive range, slightly higher levels of blood pressure can alter uterine and placental perfusion and determine fetal growth retardation.
526 THE SIGNIFICANCE OF FETAL HC/AC ASYMMETRY IN SGA INFANTS ACCORDING TO GESTATIONAL AGE AT DELIVERY. J.S. Dashe, M.J. Lucas, D.M. McIntyre, K.J. Leveno, Dept. Ob/Gyn, Univ. TX Southwestern Med. Ctr., Dallas, TX

OBJECTIVE: To assess the perinatal consequences of asymmetric fetal growth restriction in relation to gestational age at delivery.

STUDY DESIGN: Retrospective cohort study of liveborn singletons who underwent antepartum sonography within 4 weeks of delivery and who were small-for-gestational age (SGA), based on birthweight ≤ 10th percentile for our hospital population. We applied HC/AC nomograms from our sonographic database and defined asymmetric HC/AC as ≥ the 95th percentile for gestational age. Statistical analysis was performed using chi-square.

RESULTS:

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<tr>
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<th>26-36 weeks</th>
<th>37-41 weeks</th>
<th>≥ 42 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Asym</td>
<td>Sym</td>
<td>Asym</td>
</tr>
<tr>
<td>Infants</td>
<td>111</td>
<td>280</td>
<td>157</td>
</tr>
<tr>
<td>(28%)</td>
<td>(72%)</td>
<td>(17%)</td>
<td>(83%)</td>
</tr>
<tr>
<td>Malform.</td>
<td>14%*</td>
<td>5%</td>
<td>15%*</td>
</tr>
<tr>
<td>C/S, fetal distress</td>
<td>23%*</td>
<td>14%</td>
<td>8%</td>
</tr>
<tr>
<td>PPH</td>
<td>36%</td>
<td>42%</td>
<td>22%</td>
</tr>
<tr>
<td>RDS</td>
<td>25%</td>
<td>20%</td>
<td>4%*</td>
</tr>
<tr>
<td>IVH, 3 or 4</td>
<td>3%</td>
<td>2%</td>
<td>1%*</td>
</tr>
<tr>
<td>Neonatal death</td>
<td>2%</td>
<td>2%</td>
<td>2%*</td>
</tr>
</tbody>
</table>

* Significant, p < 0.01.
+ Outcomes are corrected for malformations.

CONCLUSIONS: 1) Asymmetric SGA infants are more likely preterm, but perinatal neonatal morbidity is not increased. 2) Asymmetric SGA infants at term experience increased neonatal morbidity and mortality.

527 THE SIGNIFICANCE OF ASYMMETRIC HC/AC IN THE SGA FETUS. J.S. Dashe, M.J. Lucas, D.D. McIntyre, K.J. Leveno, Dept. Ob/Gyn, Univ. TX Southwestern Medical Center, Dallas, TX

OBJECTIVE: To describe outcomes in small-for-gestational age (SGA) fetuses according to symmetry or asymmetry of HC/AC parameters.

STUDY DESIGN: Retrospective cohort study of liveborn singletons who underwent antepartum sonography within 4 weeks of delivery and who were SGA based on birthweight ≤ 10th percentile for our hospital population. We applied HC/AC nomograms from our sonographic database and defined asymmetric HC/AC as ≥ 95th percentile for gestational age. Statistical analysis was performed using chi-square.

RESULTS: 20% of SGA fetuses had asymmetric HC/AC; 80% were symmetric. Asymmetric SGA fetuses were significantly more likely to have birthweight <10th percentile for our hospital database and defined asymmetric HC/AC as ≥ 95th percentile for gestational age. Statistical analysis was performed using chi-square.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Asymmetric</th>
<th>Symmetric</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C/S, fetal distress</td>
<td>34 (14)</td>
<td>81 (8)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>PPH</td>
<td>65 (28)</td>
<td>246 (24)</td>
<td>0.18</td>
</tr>
<tr>
<td>RDS</td>
<td>96 (41)</td>
<td>266 (25)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>IVH, Grade 5 or 4</td>
<td>29 (12)</td>
<td>63 (6)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Neonatal death</td>
<td>4 (1.7)</td>
<td>4 (0.4)</td>
<td>0.02</td>
</tr>
</tbody>
</table>

CONCLUSION: SGA fetuses that demonstrate asymmetry of HC/AC parameters are at increased risk for congenital anomalies and corrected rates of intrapartum and neonatal complications.
FETAL GENDER AND MECONIUM IN TERM PREGNANCIES. Amos Grandenbaum, MD, St.Luke’s-Roosevelt Hospital, New York

OBJECTIVE: Meconium stained amniotic fluid may be a sign of advanced maturity as it increases beyond term. Presumably because of advanced fetal lung maturation, female babies generally do better in the NICU. However, little is known concerning intrauterine differences between male and female fetuses. The objective of this study was to assess differences of meconium stained amniotic fluid between male and female babies.

STUDY DESIGN: Retrospective review of computerized records of 49,947 live singleton births delivering between 1987 and 1997 from 35 to 43 weeks gestation. Multiple stepwise regression analysis.

RESULTS: There was a progressive increase of meconium stained amniotic fluid with advancing gestational age. Multiple regression analysis showed that meconium stained amniotic fluid was significantly associated with advancing gestational age, fetal weight, and fetal gender. After 39 weeks, female babies were significantly more likely to have meconium stained fluid when compared to male babies.

CONCLUSION: Female fetuses have an increased incidence of meconium stained amniotic fluid when compared to male fetuses, specifically after week 39 gestation. This study raises important questions about the physiology of pregnancy, post-dates, and the management of pregnancies in relation to the fetal gender.

NEONATAL OUTCOME IN GROWTH RESTRICTED VERSUS APPROPRIATELY GROWN PRETERM INFANTS. M. Simchen, X J. Kuint, x PhD, Turku, FI

OBJECTIVE: To examine if growth-restricted preterm infants have a different neonatal outcome than appropriately grown infants.

STUDY DESIGN: All consecutive, singleton preterm deliveries between 27 and 35 weeks' gestation were included during a 4-year period between January 1994 and December 31, 1997. Infants with congenital anomalies and infants of diabetic mothers were excluded. Infants were categorized as small-for-gestational-age (SGA) when birth weight was at or below the 10th percentile, and appropriate-for-gestation-age (AGA) when birth weight was between the 10th and 90th percentiles. Outcome variables included neonatal deaths, IVH, and necrotizing enterocolitis (NEC). Neonatal morbidity and mortality were evaluated by stepwise multivariate logistic regression analysis. Factors controlled for during the analysis included maternal age, gestational age, mode of delivery, presence of preeclampsia, HELLP syndrome, prolonged FROM, placental abruption or placenta previa, prenatatal steroid exposure, infant gender, and low Appgar score at 5 minutes.

RESULTS: The SGA group included 77 infants, and there were 209 in the AGA group. Small-for-gestational-age infants had a higher mortality rate even when confounding variables were controlled for (P = 0.003). SGA infants also had more culture-proven sepsis episodes (P = 0.001). The multivariate logistic regression model showed no significant differences between the two groups with respect to RDS, IVH, and NEC. The results were similar when analyzed separately for the group of infants at or below 32 weeks.

CONCLUSIONS: Growth-restricted preterm infants were found to have a higher mortality rate than appropriate preterm infants. Small-for-gestational-age infants had an increased mortality risk may be explained by the increased risk of sepsis in this group. Growth restriction in the preterm neonate is not a protective factor against other neonatal outcomes associated with prematurity. When considering elective preterm delivery for this high risk group of pregnancies, the increased risks in the neonatal period should be taken into account.

OBJECTIVE: To evaluate the clinical value of an antibody dependent cell-mediated cytotoxicity (ADCC) assay in the management of Rh alloimmunized pregnancies.

STUDY DESIGN: Data from 215 Rh-D alloimmunized pregnancies were analyzed retrospectively. The accuracy of the highest antibody titer and the highest ADCC result during pregnancy was assessed, to predict the need for fetal blood sampling, intrauterine transfusion, and neonatal exchange transfusion.

RESULTS: An antibody titer ≤ 1:32 and an ADCC result of ≤ 30%, correctly predicted absence of fetal disease in 99/99 and 86/86 pregnancies, respectively. Antibody titer > 1:32 correlated poorly with the severity of fetal or neonatal disease. In 19 pregnancies, the highest ADCC result was > 80%, with 71 fetuses requiring intrauterine transfusions, and another 22 neonates received exchange transfusions.

CONCLUSIONS: With the use of an ADCC assay in the management of Rh-D alloimmunization, selection of patients for referral and invasive testing may be improved significantly.

535 SPECTRAL ANALYSIS OF THE FETAL ELECTRO-ENCEPHALOGRAM: DIRECT EVIDENCE FOR THE EXISTENCE OF SLEEP CYCLES IN THE HUMAN FETUS. J. Thaler, Department of Obstetrics and Gynecology, Rambam Medical Center, Technion-Israel Institute of Technology, Haifa, Israel.

OBJECTIVE: Electroencephalography (EEG) is used as a primary indicator of sleep states in adults and infants and in the ovine and primate fetus. It is the only method available for direct monitoring of fetal cerebral function during labor. In recent years, automated methods were developed and validated to recognize behavioral states based on relationships between the EEG and other physiologic variables. In this study we employed such methods to determine whether sleep cycles are present in the human fetus at term.

STUDY DESIGN: EEG activity was recorded in 14 human fetuses by applying two suction-cup electrodes to the fetal scalp during labor. The spectral edge frequency (SEF) indicating the highest dominant frequency in the EEG signal was calculated in real-time and presented using the density spectral array technique. Fetal heart rate (FHR) and uterine contractions were also recorded and simultaneously displayed.

RESULTS: Two distinct EEG patterns were recognized: high-voltage slow activity (HVSA) and low-voltage fast activity (LVFA). The SEF was found to be highly sensitive in identifying the transition between the two states. The SEF was predominantly in the range of the sigma wave-band (12-14 Hz) during fast EEG activity and in the range of the theta (4-7 Hz) and alpha (8-11 Hz) wave-bands during slow EEG activity. During LVFA the FHR demonstrated increased variability and periodic accelerations. During HVSA the FHR had a lower baseline and a decrease in short-term variability while FHR accelerations were typically absent.

CONCLUSIONS: This is the first time human fetal sleep states are classified by real-time spectral analysis of the EEG, substantiating the existence of behavioral states in the human fetus. The SEF is effective in demonstrating the cyclic behavior of the fetal EEG by discriminating between HVSA (corresponding to state 1F) and LVFA (corresponding to states 2F and 3F).

536 ESTIMATION OF MACROSCOPIC PATHOLOGICAL LESIONS OF PLACENTA IN PATHOLOGICAL PREGNANCIES WITH MORPHOMETRIC GIRD. Krekora M., Hince P., Wizynski J. Dep. of Fetal-Maternal Medicine, PMMH, Lodz, Poland.

OBJECTIVE: The aim of the study was the evaluation of the quantitative morphologic changes in the placenta that may have an influence on the course of pregnancy, labor and neonatal state using our own idea's morphometric gird.

STUDY DESIGN: Our study included 280 placentas from pathological pregnancies. We examined placentas from preterm deliveries, pregnancies complicated by diabetes mellitus, epilepsy, preecclampsia (PE), pregnancy induced hypertension (PIH), intrauterine growth restriction (IUGR) and fetal distress (FD). Control group included 73 placentas from physiological pregnancies. All placentas were examined with specially projected morphometric gird, which makes it possible to estimate the size and the type of changes. There were four types of changes: deposition of fibir, hemorrhages, infarcts and calcification.

RESULTS: We observed more frequently the presence of macroscopic pathological changes of placenta in pregnancies complicated by DM-II (hemorrhages 17% vs. 4.1%), IUGR (infarcts 27.3% vs. 6.8%), PE (infarcts 24.1% vs. 6.8%), IUGR (infarcts 27.3% vs. 6.8%) and FD (infarcts 23.9% vs. 6.8%). We did not find statistical differences in the occurrence of macroscopic pathological lesions in placentas from pregnancies complicated by DM-R, DM-RF and PIH.

CONCLUSIONS: 1. Placental infarcts were the most prevalent macroscopic lesions in the studied pathological pregnancies. 2. The highest frequency of placentas lesions were found in pregnancies complicated by preecclampsia and fetal distress. 3. Our method seems to be a useful and practical tool for quick estimation of macroscopic pathological lesions in the chorionic plate of placenta.

Acknowledgement: the study was supported by Polish Committee for Scientific Research (KBN) - grant number 4PO3E 010 09.
POSTER SESSION V

Saturday, January 23, 1999
10:30 am - 12:30 pm

Yosemite and Franciscan Rooms

CATEGORIES
Antepartum Fetal Testing
Fetus/Neonate
Ultrasound

Poster Numbers
537-651

Judges: Barbara V. Parilla, MD
        Susan M. Ramlin, MD
        George R. Saade, MD
537 SERIAL TRANSABDOMINAL AMNIOINFUSIONS IN THE MANAGEMENT OF SECOND TRIMESTER OLIGOHYDRAMNIOSES: PRELIMINARY EXPERIENCE. D. Ogungbemi, Morristown Memorial Hospital, Morristown, NJ.

OBJECTIVE: Oligohydramnios is associated with poor pregnancy outcome and is usually an indication for delivery, regardless of gestational age. The aim of this study was to evaluate the role of transabdominal amniinfusion in relieving oligohydramnios and improving pregnancy outcome.

STUDY DESIGN: Patients with oligohydramnios (AFI<5) between 17-29 weeks gestation were enrolled. Normal fetal anatomy was confirmed on targeted sonogram. Infection and labor were excluded. Informed consent was obtained. Under ultrasonic guidance, a 20 gauge needle was inserted in the uterine cavity and normal saline was infused until the AFI was normal. Repeat amniinfusion was done weekly if oligohydramnios recurred.

RESULTS: There were 13 cases. Oligohydramnios was associated with PPROM in 9 cases, with IUGR in 2 and Factor V Leiden mutation in another 2 cases. The mean gestational age at first procedure was 22.9 weeks (range 17-29). The mean pre-procedure AFI was 1.6 cm (range 0-4) and the mean post procedure AFI was 12.4 cm (range 7-17). The mean number of infusions was 2.4 (range 1-5). The mean first infusion to delivery interval was 29.4 days (range 4-71). The mean gestational age at delivery was 27.3 weeks (range 23-35). There were 4 neonatal deaths; 1 stillbirth and 8 babies were discharged home. The neonatal survival was 50% in the 10 cases enrolled < 25 weeks and 100% in the 3 cases enrolled > 25 weeks gestation.

Two neonates had lacerations which may have been procedure related.

CONCLUSION: In selected cases of oligohydramnios, transabdominal amniinfusion may be associated with fluid retention and pregnancy prolongation.

538 THE ROLE OF A MATERNAL-FETAL MEDICINE UNIT IN THE PRENATAL DIAGNOSIS OF FETAL ANOMALIES IN A REGIONAL TERTIARY CENTER. D. Ogungbemi, S. Boyske, Morristown Memorial Hospital, Morristown, NJ, Rutgers University, Piscataway, NJ.

OBJECTIVE: The aim of this study was to determine the accuracy of anomalies detection in a regional center and to evaluate the role of the maternal fetal unit.

STUDY DESIGN: This was a retrospective study of all patients with a diagnosis of a birth defect in a 12 month period. Records were reviewed for site of ultrasound (US) performance, reports and delivery outcome. Patients were divided into: 1) if US was performed in the Perinatal Diagnostic Testing Center (PDTC), 2) OTHERS, if US was performed by a radiologist or by the obstetrician. Fisher's exact test was used for statistical analysis.

RESULTS: Birth defects were present in 141 (3.9%) neonates. There were 198 distinct birth defects. In 72 (36%) the defect was not amenable to prenatal diagnosis; in 113 (57%) prenatal diagnosis was possible and in 11 (5 %) late prenatal diagnosis was possible. PDTC correctly diagnosed 24/31 (77%) of cases with the possibility of prenatal diagnosis as compared with 41/99 (41%) in OTHERS (p<.0001). There were 12 cases of intestinal obstruction and 1 case of skeletal dysplasia in which late diagnosis was possible and of these 2 cases of intestinal obstruction were diagnosed at 29 and 27 weeks in PDTC.

CONCLUSIONS: Maternal fetal medicine specialist involvement improves accuracy of prenatal diagnosis. A repeat third trimester ultrasound may be useful in detecting late evolving anomalies.

539 CAN AMNIOTIC FLUID INDEX PREDICT MACROSOMIA IN DIABETIC PREGNANCIES? Mansina Kene, MD†, Karen Dotman, RN, MD†, Raul Vidal, MD†, Janice Byrne, MD†, Tony Wen, MD‡ 1Dept. Ob/Gyn, Baylor College of Medicine, Houston, Texas 2Dept. Ob/Gyn, The University of Texas Health Science Center at San Antonio, Texas.

OBJECTIVE: To determine if the amniotic fluid index (AFI) in uncomplicated insulin requiring diabetic pregnancies could be used to predict those gestations destined to deliver macrosomic infants.

STUDY DESIGN: 200 insulin requiring class A2 and class B singleton gestations between 1992 and 1997 underwent routine weekly or twice weekly biophysical profile (BPP) testing by the same ultrasoundographer starting at 32 weeks. Last AFI values within 1 week prior to delivery were correlated with the infant's birth weight. Data analyses were performed with Mann-Whitney test, Chi-Square test and Receiver Operator Curve.

RESULTS: 192 class A2 and 28 class B diabetics fulfilled inclusion criteria. AFI values proximate to delivery were determined to significantly correlate with increasing birthweight. Infants were divided into those weighing <4000g (N=155; 70.5%), >4000g(N=65; 29.5%) and >4250g (N=36; 16.4%). No statistically significant difference in maternal age, race, gravidity, class of diabetes, gestational age, or infant sex was noted between the birthweight categories. The cesarean section rate for <4000g, >4000g, >4250g infants were 32.2%, 46.2%,58.3%, respectively (p <.001). A receiver operator curve performed for birthweight and AFI found that similar AFI cutoff value of 15.5 cm within one week of delivery to have a relative risk of 3.7 (95%CI:2.6-5.3) and 0.9 (95%CI:3.8-12.9) for delivery of an infant with birthweight greater than 4000g and 4250g, respectively. The AFI cutoff value of 15.5 cm has a sensitivity of 52% and 60% and a specificity of 85% and 86% for predicting birthweight greater than 4000g and 4250g, respectively in pregnancies complicated by insulin requiring diabetes.

CONCLUSIONS: Amniotic fluid index correlates well with infant birthweight in class A2 and B diabetic pregnancies. AFI is routinely performed as part of the BPP testing for antenatal surveillance, making it readily available as a possible screening tool for macrosomia. An AFI ≥15.5cm, measured within one week of delivery has a relative risk of 3 and 6.9 for delivery of infants with birthweight greater than 4000g and 4250g, respectively in pregnancies complicated by insulin requiring diabetes.

540 EVALUATING THE CLINICAL UTILITY OF COLOR DOPPLER TO CALCULATE THE AMNIOTIC FLUID INDEX IN TERM PREGNANCIES. D. Abramowicz, B. C. Mather, B. M. Sibai, B. M. Mercer, Dept. of Obstetrics and Gynecology, University of Tennessee, Memphis.

OBJECTIVE: To determine the clinical value of the amniotic fluid index (AFI) calculated by the 4 quadrant traditional method to that with color Doppler (CD).

STUDY DESIGN: 100 women with singleton pregnancies, intact membranes and ≥40 weeks' gestation were prospectively evaluated by two methods to calculate AFI: (1) the traditional 4 quadrant technique in grayscale (GS) ultrasound, and (2) the same technique using CD to visualize the cord and measure the deepest fluid pocket not traversed by the visible umbilical cord. All decision making was done using information retrieved from the GS ultrasound. An AFI ≤5 cm was considered "oligohydramnios" and was used as an indication to induce labor regardless of cervical Bishop score. The patients were followed until delivery and data were collected for the following variables: Apgar score, cesarean section for fetal distress, variable decelerations requiring amnioinfusion, meconium staining, and NICU admission.

RESULTS: Mean AFI (±SD) calculation without CD was 11.5±5.0 cm, with an AFI ≤5 cm in 12% of patients. Mean AFI (±SD) using CD was 9.5±5.0 cm, with an AFI ≤5 cm in 24%. Outcomes for patients with an AFI <5 cm grayscale are compared to those additional patients with an AFI <5 cm color Doppler only and those with a normal AFI by both (Table).

CONCLUSION: AFI calculated with color Doppler will double the frequency of the diagnosis of oligohydramnios (AFI ≤5 cm), but identify additional patients at risk for perinatal complications.
541 MAGNESIUM SULFATE TRANSIENTLY INCREASES FETAL BREATHING MOVEMENTS BUT NOT BODY MOVEMENTS. M. Halilak, J. Martinez-Pover, M.L. Kruger, M. King, E. Russell, Y. Sorokin. Division of MFM, Dept. of Ob/Gyn, Wayne State Univ, Detroit, MI.

OBJECTIVE: To determine the effect of magnesium sulfate (MgSO4) on fetal breathing movements (FBM) and movements (FBM) during the third trimester of normal pregnancies.

STUDY DESIGN: Normal, healthy, not laboring, pregnant patients at >30 weeks gestation were recruited. Baseline biophysical profile (BPP) for 30 minutes was performed. After 800 kcal meal patients were randomized to MgSO4 and saline groups. Unlabeled IV bags were previously prepared by a pharmacist. A loading dose of intravenous 6 g of MgSO4 or saline was followed with a maintenance dose of 2 g/hr IV drip for 3 hours. BPP was repeated at 1 and 3 hours of MgSO4 infusion. Cumulative length of times of FBM & FBM were recorded on line by the investigator using 2 stopwatches. All BPPs were videotaped. Maternal blood was drawn at 0, 1 and 3 hours for magnesium, glucose, and insulin levels. MANCOVA was applied with glucose, insulin, estimated fetal weight, gestational age, maternal weight, and MgSO4 administration interval as covarates.

RESULTS: MgSO4 transiently increased FBM but not FM (table). MgSO4 treatment was elevated (>200%) at 1 and 3 hours in the study group only.

<table>
<thead>
<tr>
<th>Saline (n = 19)</th>
<th>MgSO4 (n = 17)</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of baseline</td>
<td></td>
</tr>
<tr>
<td>1 hour</td>
<td>3 hours</td>
</tr>
<tr>
<td>Fetal Breathing Movements</td>
<td></td>
</tr>
<tr>
<td>974 ± 210</td>
<td>91.6 ± 21.0</td>
</tr>
<tr>
<td>Fetal movements</td>
<td></td>
</tr>
<tr>
<td>157.7 ± 202.5</td>
<td>190.0 ± 253.8</td>
</tr>
</tbody>
</table>

CONCLUSIONS: FBM were significantly increased after 1 hour of MgSO4 administration and were back to baseline level after 3 hours. FM were not significantly affected by MgSO4. These results should be considered when assessing fetal well being in mothers treated with MgSO4.

542 MAGNESIUM SULFATE EFFECT ON FETAL HEART RATE (FHR) PARAMETERS: A RANDOMIZED, PLACEBO CONTROLLED TRIAL. M. Halilak, J. Martinez-Pover, M.L. Kruger, S. Hassan, S.G. Blackwell, Y. Sorokin. Division of MFM, Dept. of Ob/Gyn, Wayne State University School of Medicine, Detroit, Michigan.

OBJECTIVE: To determine the effect of magnesium sulfate (MgSO4) on FHR baseline, variability and accelerations/decelerations pattern.

STUDY DESIGN: Normal, not laboring, pregnant patients at >30 weeks gestation who scored an AFI (< 5) were induced until Amniotic fluid index measurement was recorde. Anesthesia was induced and allowed until Amniotic fluid index measurement was recorde. Any patient that scored an AFI > 5 was excluded.

RESULTS: MgSO4 administration resulted in decreased FHR baseline and variability in the 3rd hour (table). MgSO4 blocked the positive correlation between gestational age (GA) and number of accelerations found in controls. No significant decelerations were identified.

<table>
<thead>
<tr>
<th>*p&lt;0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saline (n=16) / MgSO4 (n=18)</td>
</tr>
<tr>
<td>% of baseline</td>
</tr>
<tr>
<td>(Mean ± SD)</td>
</tr>
<tr>
<td>0 hour</td>
</tr>
<tr>
<td>Baseline</td>
</tr>
<tr>
<td>(bpm)</td>
</tr>
<tr>
<td>Variability</td>
</tr>
<tr>
<td>(F/F)</td>
</tr>
<tr>
<td>Acceleration</td>
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<tr>
<td>(*/h)</td>
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</tbody>
</table>

CONCLUSIONS: Prolonged administration of MgSO4 was associated with decreased FHR baseline & variability. In light of the small magnitude of these changes the clinical significance of these findings is questionable. MgSO4 inhibition of the increasing number of FBM accelerations with GA needs to be considered when assessing fetal well being.
545 ROUTINE THIRD TRIMESTER ULTRASOUND INCREASES THE RISK OF C/S WITH NO IMPROVEMENT IN OUTCOME U. Magrath, J.A. Copel. Dept OB/GYN, Yale Univ, New Haven, CT.

OBJECTIVE: To determine whether a routine third trimester ultrasound (US) for growth and amniotic fluid improves outcome.

STUDY DESIGN: The study group all had an obstetric US from 15 to 26 gestation to confirm dates and diagnose anomalies. US were performed on an ATL Ultramark 4 in the resident clinic by a rotating group of sonographers. All images were reviewed by the attending perinatologist at the end of the session. Patients who underwent a termination of pregnancy or who had an anomaly or twins were excluded. Patients with appointments in the morning clinic were offered an US for growth. Patients in the afternoon clinic were not offered a third trimester US unless indicated. Obstetric and neonatal charts were reviewed in all cases.

RESULTS: There were 861 women followed over an 18 month period who met criteria. There was no difference in age, gravidity, smoking or drug use.

<table>
<thead>
<tr>
<th>No 3rd Term US</th>
<th>Routine US</th>
<th>Indicated US</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>505</td>
<td>175</td>
</tr>
<tr>
<td>Age</td>
<td>23.3 ± 5.4</td>
<td>23.7 ± 5.0</td>
</tr>
<tr>
<td>Gravidity</td>
<td>3.1 ± 2.0</td>
<td>3.0 ± 1.9</td>
</tr>
<tr>
<td>Smoking</td>
<td>32.1%</td>
<td>36.6%</td>
</tr>
<tr>
<td>Drug Use</td>
<td>10.6%</td>
<td>10.6%</td>
</tr>
<tr>
<td>Antepartum Testing</td>
<td>1.8%</td>
<td>9.9%*</td>
</tr>
</tbody>
</table>

* p<0.001. **p<0.01

CONCLUSIONS: In the absence of anomalies or twins, routine third trimester US is associated with an increase in antepartum testing and C/S with no difference in birthweight or neonatal outcome and therefore should be discouraged.

546 USER'S AWARENESS OF HOW TO COMPLY WITH U.S. FOOD AND DRUG ADMINISTRATION RECOMMENDATIONS FOR THE SAFE USE OF OBSTETRICAL ULTRASOUND. Sherri A. Longo, Jon Yeni\^xi, Tulane University School of Medicine, New Orleans, LA, Women's Hospital, Long Beach Memorial Medical Center, Long Beach, CA and University of California, Irvine, Orange, CA.

OBJECTIVE: To determine if an opportunity existed to improve ultrasound users' awareness of the U.S. Food and Drug Administration (FDA) recommendations pertaining to safe utilization of ultrasound.

STUDY DESIGN: A 31 question survey was mailed to the 1760 current members of the Society for Maternal-Fetal Medicine to determine their awareness of the control of ultrasound acoustic output which was the subject of the American College of Obstetrics and Gynecology Committee Opinion Number 180, November 1996 "New Ultrasound Output Display Standard". Specific terms that were detailed included thermal index (TI), mechanical index (MI), acoustic output, and as low as reasonably achievable (ALARA) output. There were 156 completed questionnaires returned, representing 9% of the total sample population.

RESULTS: 67% of respondents were aware that some ultrasound machines purchased after 1992 have the capability of exceeding recommended maximum allowable acoustic output for obstetrical applications. But, only 40% were aware of the acoustic output being monitored during the exam and only 23% reduced acoustic output to the lowest range. The table lists 6 example topics of the questionnaire and percent of members who answered correctly:

<table>
<thead>
<tr>
<th>TI</th>
<th>MI</th>
<th>ALARA</th>
</tr>
</thead>
<tbody>
<tr>
<td>31%</td>
<td>22%</td>
<td>25%</td>
</tr>
</tbody>
</table>

The average cumulative correct score was 47% (95% CI: 44% - 50%). Only 40% reported reading the ultrasound safety portion of their user manual and 10% had been invited to an in service pertaining to ultrasound safety. Yet, 85% desired accessiblity to a person knowledgeable in ultrasound safety.

CONCLUSION: It is our opinion, that increasing awareness of users to current FDA safety standards for ultrasound equipment will ensure that recommended limits of acoustic output for fetal exposure will not be exceeded and thus, decrease the potential for adverse bioeffects of ultrasonography. Future endeavors pertaining to the implementation of accessible educational resources are necessary.

547 ULTRASONOGRAPHIC DETERMINATION OF SINGLETION ESTIMATED FETAL WEIGHT: HOW DOES IT COMPARE TO ESTABLISHED ACTUAL BIRTH WEIGHT PERCENTILE CURVES. DA McLean, Cy Ananth\^x, ER Guzman, AM Vintzileos. UMDNJ-Robert Wood Johnson Medical School/ St. Peter's Medical Center, New Brunswick, NJ.

OBJECTIVE: The determination of estimated fetal weight is an important clinical decision-making tool. The estimated fetal weight (EFW) is usually compared to birth weight percentiles to diagnose fetal growth restriction (FGR). The purpose of this study was to compare the estimated fetal weight percentile curves as established from a large number of ultrasound (US) exams in our institution, with previously published actual birth weight curves and to determine whether this common clinical practice is a valid comparison.

STUDY DESIGN: Ultrasonographic data collected on singleton fetuses from 10/94-05/98 in the Antenatal Testing Unit of our institution were reviewed. The estimated fetal weight was calculated using the method described by Hadlock et al. (Radiology 1984; 152:497501). The normogram for estimated fetal weight was developed using gestational age only in cases where there was agreement within 2 weeks between last menstrual period (LMP) and US derived gestational age. The normogram for estimated fetal weight curves the 10th percentile of singleton birth weight were consistently underestimated by the ultrasound determined estimated fetal weight. The difference in weight is illustrated:

CONCLUSIONS: There is a significant difference in the 10th percentile for sonographically estimated estimated fetal weight compared with actual birth weight throughout the gestational duration. This difference may lead to an underestimation of the true incidence of FGR. The diagnosis of FGR should be based on percentile curves derived from sonographically estimated fetal weight as opposed to actual birth weight.

548 PREGNATAL DIAGNOSIS OF ABNORMAL PLACENTAL INVASION IS NOT FOOLPROOF. C.A. Burch\^r, A.D. Hull, A.L. Scioscia. Department of Reproductive Medicine, University of California San Diego, La Jolla, CA.

OBJECTIVE: To review the accuracy of prenatal diagnosis of placenta accreta (PA), increta (PI) or percreta (PP) in a high risk population.

STUDY DESIGN: 26 patients underwent cesarean hysterectomy because of abnormal placental invasion (n = 13 PA, 5 PI, 8 PP). All patients were in increased risk of abnormal placenta because of previous cesarean section and/or placenta previa. All subjects underwent prenatal ultrasound (US) examination including color flow doppler studies, 10 subjects also underwent magnetic resonance imaging (MRI) with gadolinium contrast.

RESULTS: Abnormal placental invasion was suspected prenatally in 12/25 subjects based on US findings (46% detection rate). 14/26 patients were incorrectly identified as having normal placenta (54% false negative rate). No cases of PP were identified as such prior to delivery.

Prenatal Diagnosis by US & MRI

<table>
<thead>
<tr>
<th>Actual pathology (n)</th>
<th>PA (13)</th>
<th>PI (5)</th>
<th>PP (8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PP</td>
<td>0 [2]</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Conclusions: Despite the combination of a high-risk population, high index of suspicion and excellent imaging techniques only 6% of patients were correctly identified as having abnormal placental invasion prior to delivery. MRI confirmed 8/10 cases suspected on US, but was falsly negative in 2/10 cases. Both US and MRI underestimated the degree of placental invasion. We do not yet have a perfect tool for the prenatal diagnosis of abnormal placental invasion. Surgeons should be prepared for the worst, even in the presence of apparently negative studies.
549 PC BASED PERINATAL ULTRASOUND ARCHIVING: A COST EFFECTIVE SOLUTION. I.E. Zadoian, L. Chik, M. Treadwell, H. Wolfe, S. Berry, T. Jones. Dept. OB/GYN, Wayne State University/Hutzel Hospital, Detroit, MI.

OBJECTIVE: The performance of a personal computer (PC) based program for a perinatal ultrasound image archive was investigated. The objective was to provide improved management and easy access to ultrasound images from departmental PCs instead of a dedicated picture archive computer system (PACS).

STUDY DESIGN: Six dedicated scanners (ATL 3000/5000 models) with standardized "DICOM" storage class user interface were connected to the departmental subnet for direct communication with bedside PCs and other sites. A PC file server was used for image storage. A DICOM storage class provider (SCP) program (Digital Jacket) was used to create the image archive. Another program (OSIRIS) was used for image browsing. Upon clinical review, scanned images were "pushed" from the scanners to the server, as well as printed as usual. The supervising perinatologists assessed the image quality.

RESULTS: During a 10-day assessment period, images of 398 patients were collected, averaging 10 static images per patient exam. No image was lost or corrupted due to network traffic; no network traffic jam was created. Comparison of the standard thermal printer picture and the digital images (512 x 512 pixels) indicated a superior quality of the latter. An uncompressed single static image required 300KB. A 32-Gigabyte server would accommodate our workload of 40 patients/day for a calendar year (about 1 CD-ROM per week).

CONCLUSIONS: PC-based ultrasound image archiving appears effective in a networked perinatal service. Instead of costly dedicated PACS systems (cost >$15000), existing departmental workstations and servers can be placed in service by adding a low cost DICOM SCP program (cost <$1500).

This in turn allows a more efficient perinatal ultrasound data management.

551 ASSOCIATION BETWEEN FETAL GROWTH RESTRICTION AND UNEXPLAINED STILLBIRTH AT TERM. J. Gardos*, A. Francis*, R. Settare*, PRAM, QMC-University Hospital, Nottingham, and West Midlands Perinatal Audit Unit, UK.

OBJECTIVE: Unexplained stillbirth is the single largest category of perinatal mortality in developed countries. Recent evidence has suggested an association with fetal growth restriction, predominantly in the perinatal period, and we wanted to investigate whether this relationship also holds for fetal deaths at term.

STUDY DESIGN: Case control study with 124 controls live born at 37+ weeks. Gestational age was calculated from routine early pregnancy ultrasound, and an average two days were deducted from gestational age at delivery to get the approximate age at fetal death. Weight centiles were calculated using the local birthweight standard.

RESULTS: There were 58 stillbirths, of which 38 (65.5%) were 'unexplained' and 20 (34%) of known causes (most often maternal diabetes or placental abruption). There were no significant differences in maternal weight, parity and smoking, but more women with stillbirths were of short stature (OR 2.4, CI 1.3-4.6) and of non-European ethnic background (OR 3.0, CI 1.6 - 5.9). The median weight percentile was 48% in the control group, 55 amongst stillbirths with known causes (n.s.), but only 29 for unexplained stillbirths (p<0.01, Mann-Whitney U test). 13% of babies in the control group were SGA (<10th percentile), compared to 15% of stillbirths with known causes (n.s.) and 34% of 'unexplained' stillbirths (OR 3.6, CI 1.5-8.5). The relationship between unexplained fetal death and SGA also holds true when birthweight limits are individually adjusted for pregnancy characteristics such as maternal height, weight, ethnic group and parity but not smoking.

CONCLUSIONS: Many stillbirths at term currently categorized as 'unexplained' have evidence of preceding growth failure.

550 PREDICTIVE VALUE OF CUSTOMISED FETAL WEIGHT LIMITS FOR THE ANTENATAL DETECTION OF GROWTH RESTRICTION. C.L. de Jong*, A. Francis*, HP van Geijn, J. Gardosi. Dept OB/GYN, University Hospital, Vrije Universiteit, Amsterdam, NL and PRAM, QMC-University Hospital, Nottingham, UK.

OBJECTIVE: Adjustable birth weight standards have recently been shown to enhance the association between smallness-for-gestational-age (SGA) and pathological outcome. We wanted to define optimal cut-off limits for adjustable fetal weight centiles, and determine their predictive value for fetal growth restriction and associated events.

STUDY DESIGN: 215 women at risk of unexplained insufficiency were referred to a research clinic for serial ultrasound scans. Ultrasound fetal weights were derived using standard formulae. Fetal weight percentiles were calculated retrospectively after individual adjustments for pregnancy characteristics, including maternal weight in early pregnancy, maternal height, ethnic group, parity and sex.

RESULTS: One or more antenatal scans indicative of fetal weight below the 10th or 90th centiles were significantly predictive of SGA at birth (p<0.001), operative delivery for fetal distress (p<0.01) and admission to neonatal intensive care (p<0.01) but not for a low umbilical artery pH (p=0.6). Receiver operator curves showed the optimal customised fetal weight limit for predicting an SGA neonate to be the 18th percentile (sensitivity 83%, specificity 75%, positive predictive value 33%, negative predictive value 92%). For prediction of operative delivery for fetal distress and admission to neonatal intensive care, the optimal customised cut-off was the 28th percentile.

CONCLUSION: The assessment of fetal weight using ultrasound and an individually adjusted standard is predictive of growth restriction and perinatal events associated with hypoxia and diminished reserve. The optimal predictive values are close to the 18th percentile which is therefore an appropriate limit for clinical use. For antenatal prediction of a birth weight <10th percentile, a customised fetal weight limit of the 20th percentile should be used.

552 CUSTOMISED VS. UNCUSTOMISED WEIGHT LIMITS IN THE ASSESSMENT OF FETAL GROWTH RESTRICTION BASED ON POST-MORTEM. J. Gardos, A. Francis*, R. Settare*, PRAM, QMC-University Hospital, Nottingham.

OBJECTIVE: Individually adjusted or "customized" birthweight improves the detection of fetal growth restriction (FGR). We wanted to evaluate customized centiles in term stillbirths with post-mortem.

STUDY DESIGN: The database consisted of 38 unexplained stillbirths at term who had a postmortem. An average two days were deducted from gestational age at delivery to get the approximate age at fetal death. Weight centiles were calculated by 1. a scan-dated local birthweight standard and 2. a customized weight standard, adjusted for individual pregnancy characteristics, including maternal weight at booking, maternal height, ethnic group and parity.

RESULTS: There were 38 'unexplained' stillbirths, including 13 (34%) with features of FGR seen at post-mortem. The graph shows ROC-curves for general and customized weight limits. The unadjusted 10th centile had sensitivity of 69% and specificity of 84%, and the 10th customized centile had a sensitivity of 77% and specificity of 88% for detecting FGR as diagnosed on post-mortem.

CONCLUSIONS: Unexplained stillbirths at term have a higher rate of growth failure as evidenced by post-mortem. Customized standards for weight-for-gestational age improve the assessment of FGR.
553  A STANDARD FOR NORMAL FETAL GROWTH IN TWIN PREGNANCY
J Gardosi, A Francis*, PRAM, QMC-University Hospital, Nottingham, UK
OBJECTIVE: To date, birthweight standards are used to assess growth in twins. They are usually derived from normal as well as pathological pregnancies and include both twins.

STUDY DESIGN: From a total of 305 twin deliveries, we selected 105 cases in which 1. both twins were live born; 2. pregnancy was dated by ultrasound; 3. gestation at delivery was at least 34.0 weeks gestation 4. spontaneous onset of labour 5. no twin-twin discordance (>15% difference in birth weight) 6. two or more third trimester ultrasound ‘growth’ scans. We used a standard weight formula and a previously described log polynomial model to derive individual curves which were averaged. The standard was based on twin A.

RESULTS: The average birthweight was 2741 g (SD=276) at the median gestational age of 255 days. The distribution was normal. The growth curve showed continued weight gain and minimal flattening at term. The graphs show birthweights from pregnancies with discordance (>15%), plotted on the twin fetal weight standard.

CONCLUSIONS: Twins are at increased risk of growth deficit. However, a substantial proportion have no evidence of growth failure and growth continues until delivery. Fetal growth charts specific to twins and derived from uncomplicated pregnancies ought to improve the distinction between normal and abnormal growth in twins.

554  ASSOCIATION BETWEEN LENGTH OF THE PRE-CONCEPTUAL FOLLICULAR PHASE AND THE SEX OF THE BABY / J Gardosi, A Francis*, PRAM, QMC-University Hospital, Nottingham, UK
OBJECTIVE: It has recently been suggested that the sex ratio at birth may be associated with the length of the follicular phase of the cycle. We investigated this with a scan dating formula derived from IVF pregnancies with known dates. We have previously shown that the biparietal diameter (BPD) measurements of male and female fetuses in the second trimester are indistinguishable.

STUDY DESIGN: 20,812 consecutive singleton pregnancies from a general maternity population, with certain LMP dates and routine second trimester scan but otherwise unselected. The day of conception was based on the BPD, and the menstrual - scan discrepancy was used to calculate the interval between LMP and conception, i.e. the length of the follicular phase.

RESULTS: There was a difference of 2 days in follicular phase length between the sexes, with a median length of 14 days for boys (interquartile range [IQ] 10-19) and 16 days for girls (IQ 12-21). This shift was associated with a decreasing male/female ratio: it was high (mean 1.51) when the follicular phase length was <14 days, and low (0.78) when it was prolonged (>16 days) (OR 1.93, CI 1.81 - 2.06)

CONCLUSIONS: Follicular phase length is related to sex ratio, and males are on average conceived 2 days earlier within the conception cycle. This difference between the sexes has ramifications for the assessment of the length of pregnancy at prenatal diagnosis, prematurity delivery, and post term pregnancy.

555  EFFECT OF BETAMETHASONE ON HEART RATE VARIATION IN PRETERM GROWTH RETARDED FETUSES IN RELATION TO INDECIES OF REDISTRIBUTION OF FETAL BLOOD FLOW. T Prasad, M.Soregaroli, A.Vakamunio, L.Scalvi, R.Bonera, U.A.Bianchi. Department of Obstetrics and Gynecology, University of Brescia, Italy

OBJECTIVE: to verify changes in computerized cardiotocography (CTG) in relation to betamethasone treatment for fetal lung maturation in growth retarded (GR) fetuses - to compare the CTG variations in GR fetuses with and without sign of blood redistribution.

DESIGN AND METHODS: 48 fetuses < 34w GR (ultrasound abdominal circumference <2nd SD of normal Italian population) received 2 intramuscular injection of 12 mg betamethasone 24 hours apart. Fetal velocimetry of umbilical (U) and middle cerebral (C) artery were studied before any treatment by means of Aloka 1800. U/C ratio >1 was considered sign of fetal blood redistribution. FHR was recorded by Sonicaid System 8002 before the first injection (Day 0), within 24 hours (Day 1) and at 24 hours (Day 2), and two days after end of the betamethasone administration (Day 4). FHR movements (FM), basal heart rate (HR), short term variation (STV), long term variation (LTV), numbers of small accelerations (SA), percentage of time spent in high variability (PHV) were the CTG parameters calculated.

RESULTS: significant reductions of FM on day 2 and 3, of LTV and PHV on day 3 were found, while no significant changes in STV, basal HR and small accelerations were recorded. 28 fetuses (58%) had abnormal U/C ratio (Group A), clinical characteristics were not different from group B (normal U/C ratio). Results of the analysis in the two groups are reported:

<table>
<thead>
<tr>
<th></th>
<th>FM</th>
<th>STV</th>
<th>LTV</th>
<th>PHV</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>D0</td>
<td>41±26</td>
<td>36±18</td>
<td>6.8±2.2</td>
<td>6.2±1.4</td>
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<tr>
<td>D1</td>
<td>36±27</td>
<td>36±28</td>
<td>7.5±2.2</td>
<td>6.8±1.6</td>
</tr>
<tr>
<td>D2</td>
<td>25±17*</td>
<td>29±19*</td>
<td>6.2±1.1</td>
<td>5.2±1.1</td>
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<tr>
<td>D3</td>
<td>26±18*</td>
<td>25±20*</td>
<td>5.8±1.7</td>
<td>5.1±1.7</td>
</tr>
<tr>
<td>D4</td>
<td>29±16*</td>
<td>40±15</td>
<td>6.0±1.9</td>
<td>6.2±2</td>
</tr>
</tbody>
</table>

*p<0.05 if compared to Day0

No differences in basal HR and small accelerations were recorded.

CONCLUSIONS: GR fetuses show reduction of FM, LTV and PHV during and after (Day 5) treatment with betamethasone. GR fetuses with abnormal U/C show significant reduction of FM until the Day 4, and of STV and LTV on Day 5. Clinical decisions in GR fetuses on and after betamethasone treatment should not be taken solely on the basis of CTG parameters and should take into account the presence of fetal blood flow redistribution indices.

556  ANTEPARTUM AMNIOTIC FLUID INDEX AS A PREDICTOR OF ADVERSE PERINATAL OUTCOME. E. Vroman, S. Tran*, D. Wing. Dep. Ob./Gyn, University of Southern California School of Medicine, Los Angeles, CA.

OBJECTIVE: The purpose of this study was to determine whether antepartum amniotic fluid index (AFI) <5.0 cm is a predictor of adverse perinatal outcome.

STUDY DESIGN: The antepartum testing records of 525 women seen over a ten-month period were reviewed. Of these, 465 had an AFI >5 and 80 had an AFI ≤5. Inclusion criteria included a nonanomalous fetus and delivery within seven days of the last antepartum surveillance (modified biophysical profile). Data was compared using Chi Square analysis, Fisher’s exact test, and t-tests where appropriate. P values <0.05 were considered significant.

RESULTS: Patients with oligohydramnios (AFI ≤5.0) were more likely to have a nonreactive antepartum test (p=0.005) and a lower fetal heart rate pattern than those with normal AFI (p<0.05). They were also more likely to have oligohydramnios (AFI ≤5.0) than those patients with an AFI >5 (p=0.005). There was no significant difference in overall incidence of cesarean section (23.1% vs. 16.7% for the AFI >5 and the AFI ≤5 groups respectively). There was no significant difference in overall incidence of cesarean section (23.1% vs. 16.7% for the AFI >5 and the AFI ≤5 groups respectively). There was no significant difference in overall incidence of cesarean section (23.1% vs. 16.7% for the AFI >5 and the AFI ≤5 groups respectively). There was no significant difference in overall incidence of cesarean section (23.1% vs. 16.7% for the AFI >5 and the AFI ≤5 groups respectively). There was no significant difference in overall incidence of cesarean section (23.1% vs. 16.7% for the AFI >5 and the AFI ≤5 groups respectively). There was no significant difference in overall incidence of cesarean section (23.1% vs. 16.7% for the AFI >5 and the AFI ≤5 groups respectively).

CONCLUSIONS: Antepartum oligohydramnios is associated with an increased risk of fetal heart rate abnormalities and a slightly higher incidence of cesarean for fetal distress. However, it is not predictive of adverse perinatal outcome as measured by low Apgars and NICU admissions.
557 GROWTH PATTERN OF FETAL ALCOHOL SYNDROME FETUSES.  
J. Martinez-Poyer, H.M. Wolfe, S. Martier, R. Sokol, Dept Obstetrics and Gynecology and Dept of Psychology, Wayne State University, Detroit, MI  
OBJECTIVE: To establish the pattern of intranatal growth of fetal alcohol syndrome examinations (FAS). 
STUDY DESIGN: The ultrasonographic examinations of 47 FAS fetuses were reviewed retrospectively. Inclusion criteria were known gestational dating and a minimum of two ultrasounds per patient more than three weeks apart. Biparietal diameter (BPD), head circumference (HC), femur length (FL), and abdominal circumference (AC) were recorded for each case. Estimated fetal weight (EFW) was calculated based on all four parameters. Each parameter was expressed as its percentile equivalent for gestational age on the basis of our hospital population. Examinations were grouped for analysis as second trimester (13-26 weeks) and third trimester (27-40 weeks). Medians were calculated for each parameter and compared between the two gestational periods using the Wilcoxon Signed Rank test. 
RESULTS: Eleven patients met inclusion criteria. Mean gestational age for the second and third trimester examinations were 21.8 weeks (range 15-36) and 33.8 weeks (range 29.6-37), respectively. A mean reduction of 19% was observed in the BPD (p=0.04, one tail), with a weekly percentile reduction of 1.6%. EFW, FL, was the parameter most and earliest affected by alcohol exposure. No impact was seen in AC. 

<table>
<thead>
<tr>
<th>Second Trimester (N=11)</th>
<th>Third Trimester (N=11)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GA</td>
<td>BPD</td>
</tr>
<tr>
<td>21.5</td>
<td>23</td>
</tr>
<tr>
<td>(Median Percentiles)</td>
<td>(Mean %)</td>
</tr>
</tbody>
</table>

CONCLUSIONS: The growth restriction of FAS is of early onset. The marked reduction in FL observed throughout the last two trimesters is probably an expression of early alcohol-induced cellular insult with a net effect on body length. The observed decrease in BPD is consistent with alcohol impact on brain growth in the third trimester and may offer the potential for late intervention to improve neurobehavioral outcome.

559 DISCORDANCE IN SONOGRAPHICALLY DETERMINED ESTIMATED FETAL WEIGHTS AND BIRTH WEIGHTS IN TRIPLET PREGNANCIES ACROSS GESTATIONAL AGE.  
J. Rodis, L. Arkay*, AF Borgida, JFX Egans, WA Campbell. Division of MFM, Dept. of Ob/Gyn, Univ. of CT Health Center, Farmington, CT.  
OBJECTIVE: To report our single center's 11 year experience with sonographically determined estimated fetal weight (EFW) and birthweights (BW) in triplet gestations across gestational age in order to define discordance in triplets. 
STUDY DESIGN: All women with triplet pregnancies who had ultrasound examinations by our Division from 1987-1997 were identified. Gestational age was confirmed by 1st trimester ultrasound in all cases. At each ultrasound examination, fetal lie, presentation, sex, and placental location were determined so that each triplet could be distinguished from its 2 siblings. Estimated fetal weights were calculated using Shepard's formula (BPD and AC) and Hadlock's formula (FL and AC) at each ultrasound examination along with other fetal biometric parameters. Birthweights were obtained on all infants. EFW and BW discordance was calculated between Triplet A&B, B&C, and A&C for each ultrasound examination and at birth by the formula: (weight of the larger infant-weight of the smaller infant)/weight of the larger infant x 100%. EFW as well as percent discordance was plotted against gestational age and 5th and 95th percentiles were derived using linear regression. 
RESULTS: Ultrasounds were available in 33 sets of triplets from 13-35 weeks; each had 2-8 ultrasounds (mean of 4). Birthweights ranged from 635-2515 grams. Estimated fetal weight from 15-35 weeks is shown below (left). Percent discordance in triplet pregnancies, graph below (right), is gestational-age dependent (R^2=0.059).

CONCLUSIONS: Percent discordance of estimated fetal weights in triplets is gestational-age dependent. The 95th percentile confidence interval for percent discordance is 25% at 18 weeks and rises to 52% by 32 weeks.

560 RECEIVER OPERATING CHARACTERISTIC CURVE ANALYSIS OF FACTORS USEFUL FOR PREDICTION OF CESAREAN DELIVERY IN PROLONGED PREGNANCIES.  
C. O'Reilly-Green, M.Y. Divon. Dept. of Ob/Gyn, Albert Einstein College of Medicine, Bronx, NY and Lenox Hill Hospital, New York, NY.  
OBJECTIVE: To evaluate cervical dilatation (D), hours on labor floor (H), parity (P), increasing maternal age (A), prepregnancy weight (P), and pregnancy weight gain (G) as predictors of cesarean delivery in prolonged pregnancy using receiver operating characteristic (ROC) curve analysis. 
STUDY DESIGN: In 740 patients with prolonged pregnancy, ROC curves for D, H, P, A, PRE, FIN, G, LGA and SGA as predictors of cesarean delivery were evaluated for significance. Selected curves were compared in two tailed matched pair analysis. 
RESULTS: 

<table>
<thead>
<tr>
<th>Area under ROC curve</th>
<th>Standard Error</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dilation</td>
<td>0.7581^a</td>
<td>0.0190</td>
</tr>
<tr>
<td>Hours</td>
<td>0.6579^a</td>
<td>0.0232</td>
</tr>
<tr>
<td>Parity</td>
<td>0.6133^b</td>
<td>0.0228</td>
</tr>
<tr>
<td>Age</td>
<td>0.5479^c</td>
<td>0.0244</td>
</tr>
<tr>
<td>Final Wt</td>
<td>0.5967^d</td>
<td>0.0211</td>
</tr>
<tr>
<td>Gain</td>
<td>0.5922</td>
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</tr>
<tr>
<td>LGA</td>
<td>0.5140</td>
<td>0.0270</td>
</tr>
<tr>
<td>SGA</td>
<td>0.4853</td>
<td>0.0270</td>
</tr>
</tbody>
</table>

CONCLUSIONS: This is the most comprehensive set of fetal growth measurements in triplets from women in the USA. The generated tables and graphs of BPD, HC, BCD, AC, FL, TL, and EFW can be used to assess longitudinal fetal growth of triplets.

558 COMPREHENSIVE FETAL ULTRASOUND GROWTH MEASUREMENTS IN TRIPLET GESTATIONS.  
J. Rodis, L. Arkay*, AF Borgida, JFX Egans, WA Campbell. Division of MFM, Department of Ob/Gyn, Univ. of CT Health Center, Farmington, CT.  
OBJECTIVE: To create tables and graphs of ultrasonically derived fetal growth parameters in triplet gestations from a single U.S. center. 
STUDY DESIGN: All triplet pregnancies managed by our MFM division from 1987-1998 were identified. All patients had 1st trimester dating sonograms and had complete obstetric ultrasound examinations performed by members of our division using 3.5 or 5.0 MHz curvilinear transducers with freeze-frame capability and on-screen calipers. Our standard protocol for triplets includes serial ultrasound studies to assess fetal growth every 2-4 weeks from 16-18 weeks until delivery. Fetal parameters obtained at each sonogram included: biparietal diameter (BPD), head circumference (HC), biacromial diameter (BCD), abdominal circumference (AC), femur length (FL), humerus length (HL) and tibia length (TL). Estimated fetal weights (EFW) were calculated using Shepard's and Hadlock's formula. Regression analysis of each variable with the ultrasound examination along with other fetal biometric parameters. Birthweights were obtained on all infants. EFW and BW discordance was calculated between Triplet A&B, B&C, and A&C for each ultrasound examination and at birth by the formula: (weight of the larger infant-weight of the smaller infant)/weight of the larger infant x 100%. EFW as well as percent discordance was plotted against gestational age and 5th and 95th percentiles were derived using linear regression. 
RESULTS: Ultrasounds were available in 33 sets of triplets from 13-35 weeks; each had 2-8 ultrasounds (mean of 4). Birthweights ranged from 635-2515 grams. Estimated fetal weight from 15-35 weeks is shown below (left). Percent discordance in triplet pregnancies, graph below (right), is gestational-age dependent (R^2=0.059).

CONCLUSIONS: Percent discordance of estimated fetal weights in triplets is gestational-age dependent. The 95th percentile confidence interval for percent discordance is 25% at 18 weeks and rises to 52% by 32 weeks.
561 RECEPTOR OPERATING CHARACTERISTIC (ROC) CURVES OF SONOGRAPHIC ESTIMATED FETAL WEIGHT (EFW) FOR PREDICTION OF THE SMALL FOR GESTATIONAL AGE (SGA) NEWBORN IN PROLONGED PREGNANCIES  C. O'Reilly-Green, K. Lescale, M.Y. Dixon Dept. of Ob/Gyn, Albert Einstein College of Medicine, Bronx, NY and Lenox Hill Hospital, New York, NV

OBJECTIVE: Recent studies have documented increased perinatal morbidity and mortality in the SGA post-term fetus and neonate. Our purpose was to evaluate the ROC curve of sonographic EFW as a predictor of the SGA newborn in prolonged pregnancies.

STUDY DESIGN: Sonographic EFW was obtained within 9 days of delivery (mode 1 day) in members of a cohort of 410 patients with prolonged pregnancies (>41 weeks). EFW was compared with birthweight (BWT) in ROC curve analysis.

RESULTS: The ROC curve for EFW as a test for predicting BWT <10%ile (3125 grams in this population) had an area of 0.89, and for predicting birthweights <5%ile (2930 grams in this population), it had an area of 0.96. Both areas were significantly different (p<0.000001) from 0.5, the area under an ROC curve for a usefss test. The index point for the curve for predicting BWT <3125 grams occurred at an EFW <3570 grams, and for predicting BWT <2930 grams, it occurred at an EFW <3200 grams. Using these test cutoff values, the specificity, sensitivity, and positive and negative predictive values for EFW as a predictor of birthweights <3125 grams were 84%, 79%, 29% and 98% respectively, and as a predictor of birthweights <2930 grams, they were 94%, 88%, 26% and 99.7% respectively. Using these cutoff values, the relative risk for EFW predicting BWT less than the 10%ile was 14.55 (95% confidence intervals (CI) 6.25, 33.83), and for EFW predicting BWT <5%ile, the relative risk was 89.81 (95% CI 12.13, 665.03).

CONCLUSIONS: Sonographic EFW is a useful test for predicting SGA newborn weight, defined either as birthweight <10%ile or <5%ile in prolonged pregnancy. Test cutoff values selected by this method can be utilized in a randomized prospective trial of mode of management of the post-term SGA fetus.

562 PRENATALLY DIAGNOSED CARDIAC MALFORMATIONS HAVE A HIGH RATE OF CHROMOSOMAL ABNORMALITIES, M.G. Pinette, J. Blackstone, M. Blackstone, S.G. Pinette. Dept. Ob/Gyn, Maine Medical Center, Portland, ME

OBJECTIVE: A retrospective study was performed on fetuses with prenatally diagnosed cardiac defects to determine the incidence of chromosomal abnormalities in fetuses with single cardiac defects, complex cardiac defects and cardiac plus extracardiac defects.

STUDY DESIGN: Fetuses with prenatally diagnosed cardiac malformations were subdivided into isolated (a single cardiac defect), complex (more than one defect) cardiac defects, and extracardiac (cardiac plus malformation of different organ system). Karyotype results, when available, were obtained.

RESULTS: 102 women (59% nulliparous) were studied at a mean of 19.6 weeks' gestation. The EV method was associated with a subjectively "acceptable" ultrasound examination. Unselected consenting women at 15-23 weeks' gestation were each sequentially determined the correlation between these two techniques in the mid-trimester.

RESULTS: A prospective, blinded comparison of endovaginal (EV) and transperineal (TP) cervical ultrasound examinations. Unselected consenting women at 15-23 weeks' gestation were each sequentially examined by two experienced sonologists using a GE 3200 unit with 5 MHz EV and 5.0 MHz curved linear (TP) probes. For each patient the initial sonologist and method (EV or TP) were randomly assigned, and the results were blinded between sonologists. The sample size was selected to have at least 80% power to detect a mean difference in cervical length (CL) of 5 mm.

RESULTS: 102 women (59% nulliparous) were studied at a mean of 18.9 weeks' gestation. The EV method was associated with a subjectively better image quality (96% vs 25% coded as "clear", p<0.001). In 13 cases a TP CL could not be measured versus 18 using the EV method. However, the most common reason for non-measurement of the EV CL was a poorly defined lower segment (obliteration of the internal os as a valid landmark), with artifact and poorly defined landmarks were cited most often with the TP method. In only 77 cases could both EV and TP CL be determined. Although the mean CL's were similar (EV=35.0 mm vs. TP=33.5 mm, p<0.001), the correlation was poor (r=0.38). Moreover, the difference between the EV CL and TP CL was 20% or greater in one third of the cases.

CONCLUSIONS: Transperineal ultrasonographic evaluation of the cervix is an unsatisfactory alternative to the endovaginal technique in the mid-trimester.
565 COMPARISON OF TRANSPERINEAL AND TRANSVAGINAL SONOGRAPHY IN THE ASSESSMENT OF CERVICAL LENGTH AT TERM. P.M. Bas, R.A. Bowersoxa, E.A. Dorneme, C.J. M van de Venb Dept. of Ob/Gyn and Dept of Radiology, Univ. of Michigan, Ann Arbor, MI.

OBJECTIVE: To compare transperineal (TPS) with transvaginal sonography (TVS) for the measurement and visualization of the cervix, at term.

STUDY DESIGN: Sonographic examination of the cervical length (CL) was performed in 90 patients between 35 and 42 weeks (mean 40 wks). Measurements were obtained by the first investigator and the uncertainty was reviewed by the second investigator who was blinded to the initial measurements. Three patients had the CL measured by TPS and sixty patients by both TPS and TVS. Statistical analysis was performed using paired tests, Pearson's correlation coefficient and $\chi^2$ analysis.

RESULTS: Comparison of cervical length between 1st and 2nd investigators

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean (± SD)</th>
<th>Mean difference</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TPS</td>
<td>25.6 cm (± 0.8)</td>
<td>2.54 cm (± 0.8)</td>
<td>0.3 mm</td>
</tr>
<tr>
<td>TVS</td>
<td>3.65 cm (± 0.8)</td>
<td>3.06 cm (± 0.9)</td>
<td>0.2 mm</td>
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Comparison of cervical length between TPS and TVS

<table>
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Technical adequacy of visualization of the cervix

<table>
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<tr>
<th>Adequate</th>
<th>Inadequate</th>
<th>p value</th>
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<tbody>
<tr>
<td>TPS (n=90)</td>
<td>66 (72%)</td>
<td>25 (28%)</td>
</tr>
<tr>
<td>TVS (n=60)</td>
<td>57 (95%)</td>
<td>3 (5%)</td>
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</table>

CONCLUSIONS: Measurement of CL by either TPS or TVS revealed a good correlation between investigators. TPS resulted in a consistent shorter measurement of CL difference of 0.5 cm. This may be due to acoustic shadowing from the rectum, contributing to the poor correlation between TPS and TVS at term. Transvaginal sonography appears to provide a more accurate visualization of the cervix.

566 EARLY TRANSVAGINAL SONOGRAPHY VS. EARLY CERCLAGE IN WOMEN WITH AN QUESTIONABLE HISTORY OF INCOMPETENT CERVIX. A. Sciscione, S. Koby, M. Pollock, D. Manley, J. Manley, P. Shlomson, W. Mulla, C. LeFebvre, G. Colmorgen, Division of Maternal-Fetal Medicine, Children's Hospital, Newark, DE.

OBJECTIVE: Many women present with a questionable history for the diagnosis of incompetent cervix (inc. cervices). As a result, a cerclage may be placed in women who do not have the true diagnosis. Transvaginal sonography (TVS) is a new tool, which may aid in the diagnosis of inc. cervices.

STUDY DESIGN: We sought to compare outcomes in women with a questionable history of inc. cervices, who were followed with early TVS, to those women who had an early cerclage placed.

RESULTS: Comparison of cervical length between TVS and TPS (n = 60)

<table>
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CONCLUSIONS: Cervical length measurements with the pre-formatted gynecological ultrasound instrument correlated closely (r = 0.97, S.E. of Estimate = 2.2 mm, comparable to previously reported intraobserver variability in standard cervical length measurements).
569 TWIN GESTATION: ROUTINE SECOND TRIMESTER CERVICAL LENGTH IN THE PREDICTION OF PRETERM LABOR. Leesle K. Dobuis D, O’Reilly-Green C, Drion MY. Dept of Ob/Gyn. Lenox Hill Hospital, New York, N.Y.

OBJECTIVE: Several studies have demonstrated an association between sonographic measurement of cervical length (CL) at 24 to 28 weeks of gestation and gestational age (GA) at delivery in twin gestation. We sought to determine the association between CL and GA at delivery when measured during a routine, second trimester “rule-out anomalies” ultrasound exam.

STUDY DESIGN: A review of all twin pregnancies who underwent a second trimester “rule-out anomalies” ultrasound exam at our institution was performed. Cases in which CL had been obtained were further analyzed. Pregnancies with congenital or chromosomal anomalies were excluded. Potential confounding variables such as cervical cerclage, tocolytic use, steroid prophylaxis, and bed rest were also recorded. Statistical analysis included linear regression and ROC curve analysis.

RESULTS: Twenty-nine patients formed our study population. The mean (±SD) GA at the time of sonography was 20.0 ± 1.7 weeks. The mean CL was 34.6 ± 10.4 mm (range of 10 mm to 60 mm). The mean GA at delivery was 35.1 ± 3.0 weeks (range of 23 to 39 weeks’ gestation). Linear regression analysis revealed a statistically significant association between CL and GA at delivery. GA at delivery (weeks) = 28.5 + 0.19*CL (mm); p<0.0001, R² = 0.342. ROC curve analysis revealed that the sensitivity, specificity, positive and negative predictive value of a CL ≥37 mm for predicting delivery at <36 weeks’ gestation were 93.8%, 73.3%, 78.9%, and 91.7%, respectively.

CONCLUSIONS: 1) There is a statistically significant association between CL and GA at delivery in twin gestation. 2) Approximately 42% of the variability in GA at delivery in twin gestation can be explained by CL as measured at 18 to 20 weeks.3) A CL of ≤37 mm has a PPV of 78.9% for delivery prior to 36 weeks’ gestation.


OBJECTIVE: To study the association between cervical length and gestational age at delivery in twin and triplet pregnancies.

STUDY DESIGN: All women with twin or triplet gestation from 1/97 to 8/98 were followed prospectively with serial measurements of cervical length by transvaginal ultrasound exams. Cervical lengths at 20, 24, 28 and 32 weeks were correlated with gestational age at delivery and rate of preterm delivery at ≤34 weeks. Statistical analysis used Fisher’s exact test, univariate analysis of variance, and correlation, with p<0.05 considered significant.

RESULTS: Mean ± SD gestational age at delivery was 35.0 ± 3.2 wks among twins (n=29), and 32.8 ± 2.4 wks among triplets (n=18). Both in twin and in triplet gestations there was a significant and progressive decrease in cervical length with advancing gestation. Among triplets, cervical lengths at 20 wks (p<0.01), 24 wks (p<0.01), and 28 wks (p<0.01) were correlated with gestational age at delivery. No significant correlations were observed among twins (20 wks: p=0.06; 24 wks: p=0.37; 28 wks: p=0.09, respectively).

When we compared mean cervical lengths in women delivered at ≤34 vs >35 wks, significant differences were present only among triplets at 24 wks (p=0.01), but not at 20 (p=0.54), or 28 wks (p=0.06), nor among twins at any gestational age (20 wks: p=0.27; 24 wks: p=0.41; 28 wks: p=0.06).

CONCLUSIONS: Ultrasonographic measurement of cervical length is correlated with gestational age at delivery, and is a predictor of preterm birth in triplet, but not in twin gestations.

571 WHICH ARE THE BEST SECOND-TRIMESTER SONOGRAPHIC MARKERS FOR THE DETECTION OF TRISOMY 21? A. Locatelli, F. Vergani, A. Ghidini, N. Strobel, M.G. Piccoli, F. Mariani, J.C. Pezzullo. Department of Ob/Gyn, University of Milan, ISBM San Gerardo, Monza, Italy; and Georgetown University Medical Center, Washington, D.C.

OBJECTIVE: To establish the independent predictive ability of second trimester sonographic markers for Down syndrome (DS) in the diagnosis of fetal trisomy 21.

STUDY DESIGN: All genetic sonograms (1/1/1990 and 12/31/1995) performed at 14-22 weeks in women at increased risk for fetal aneuploidies were analyzed retrospectively. The screening efficacy of structural anomalies, cardiac abnormalities (diagnosed at four-chamber view and outflow tracts), nuchal fold thickness (NFT) ≥6 mm, bowel echogenicity, choroid plexus cysts (CPC) and renal pyelectasis were evaluated. Statistical analysis included Fisher’s exact test, and logistic regression analysis using DS as the dependent variable.

RESULTS: A total of 918 women with euploid fetuses and 22 with DS underwent a genetic sonogram at a mean gestational age of 17.0 weeks (range 14-22). With the exception of bowel echogenicity and CPC, the remaining sonographic markers were more common in DS than euploid fetuses (all p≤0.001). Logistic regression analysis demonstrated that cardiac anomalies (OR=255, 95% CI 25, 2592), other structural anomalies (OR=2, 95% CI 6, 97), and NFT ≥6 mm (OR=13, 95% CI 3, 50) were the only independent predictors of DS. When any of the above markers was present, the sensitivity for the diagnosis of DS was 55% and the false positive rate was only 2%.

CONCLUSIONS: There is considerable overlap of sonographic markers among DS fetuses. Use of the markers which are independent predictors of fetal DS would result in a lower false-positive rate than using any of those that are not independent predictors.

572 ADJUSTING THE AGE-RELATED RISK OF DOWN SYNDROME IN WOMEN LESS THAN 35 YEARS OF AGE WITH THE USE OF SONOGRAPHIC MARKERS. A. Locatelli, F. Vergani, A. Ghidini, N. Strobel, M.G. Piccoli, F. Mariani, J.C. Pezzullo. Department of Ob/Gyn, University of Milan, ISBM San Gerardo, Monza, Italy; and Georgetown University Medical Center, Washington, D.C.

OBJECTIVE: To establish the independent predictive ability of second trimester sonographic markers. We calculated the factor by which the individual woman’s prior risk based on her age would be altered by the presence of specific sonographic markers.

STUDY DESIGN: All consecutive genetic sonograms (1/90 and 12/90) performed at 14-22 weeks were analyzed retrospectively. Statistical analysis included one-way analysis of variance and Fisher’s exact test, with p<0.05 considered significant. Likelihood ratios were calculated as sensitivity/false positive rate (or prevalence of each sonographic marker in the trisomy 21 population divided by the prevalence among euploid fetuses).

RESULTS: The sonographic markers were performed at a mean gestational age of 17.0 weeks; 23 fetuses had Down syndrome and 918 were euploid. Presence of structural anomalies, cardiac abnormalities (diagnosed at four-chamber view and outflow tracts), nuchal fold thickness ≥6 mm (NFT), and pyelectasis were significantly different between euploid and trisomy 21 fetuses (all p<0.001), while bowel echogenicity, isolated choroid plexus cysts, and femur length were not. The likelihood ratio for cardiac abnormalities was 77 (95% CI 74-79), for structural abnormalities 19 (95% CI 17-22), for NFT 15 (95% CI 13-17), and for pyelectasis 9 (95% CI 7-11). Presence of any of the significant markers increased the prior odds of DS by a factor of 18 (95% CI 16-20).

CONCLUSIONS: The individual sonographic markers have different ability in the prediction of DS. The magnitude of change in the risk of DS associated with the presence of each marker can be obtained by multiplying the maternal age-related odds by the specific likelihood ratio.
573 OPTIMAL THRESHOLD OF NUCHAL FOLD THICKNESS TO REDUCE THE RISK OF DOWN SYNDROME IN WOMEN 35 YEARS OF AGE OR OLDER.

OBJECTIVE: Nuchal fold thickness (NFT) is one of the best ultrasonographic predictors of fetal Down Syndrome (DS). However, the same threshold of NFT has not been used to increase the predictive odds of DS in a low risk population and to decrease it in a high risk population. Because a lower false negative rate is desired in a high risk population, we have evaluated the optimal threshold of NFT in a homogeneous series of women at risk for fetal aneuploidies because of maternal age 35 years or older.

STUDY DESIGN: We prospectively measured the NFT in women with age ≥35 years at delivery undergoing ultrasound exam at 14-22 weeks without prior knowledge of the fetal karyotype. Nuchal cystic hygromas were excluded from analysis. Statistical analysis included one-way ANOVA and receiver operating characteristic (ROC) curve analysis to establish the optimal threshold of NFT in the detection of fetal DS.

RESULTS: Mean gestational age at ultrasound was 17.0 weeks (range 14-22). Mean standard deviation NFT in euploid fetuses (n=891) was greater than in DS cases (n=23) (3.2 ± 0.9 vs 4.8 ± 1.6 mm, p<0.001).

CONCLUSIONS: In a population at high risk of DS because of maternal age, use of a NFT threshold ≥6 mm improves the detection rate of DS by 48% compared with a NFT 6 mm, but it increases the false positive rate by 28%, and it would warrant amniocentesis in 30% of women.

574 SECOND TRIMESTER SONOGRAPHIC LONG BONE LENGTH IN FETAL DOWN SYNDROME: IS IT A RELIABLE PREDICTOR ACROSS ETHNIC GROUPS?

OBJECTIVE: The risk of fetal Down syndrome (DS) can be increased by maternal age, maternal obesity, maternal diabetes mellitus, and ethnic group. As a result, screening programs for DS are based on gestational age- and ethnic group-specific reference curves. However, it is not clear whether DS fetuses have unique long bone lengths across ethnic groups.

STUDY DESIGN: Using data from a prospective double blind randomized clinical trial, 49 women with a history of recurrent pregnancy loss and at least one autoantibody were followed through their pregnancies. The participants were randomized to receive either daily Prednisone administration specifically on amniotic fluid volume and the development of cardiovascular compromise or hydroptic change is uncommon, regardless of size. The degree of mediastinal shift per se should not be considered an unfavorable prognostic factor in fetuses with an echogenic lung mass.

576 PREDNISONE DOES NOT AFFECT THE BIOPHYSICAL SCORE IN PREGNANT WOMEN WITH AUTOANTIBODIES.

OBJECTIVE: To examine prospectively the effects of systemic maternal Prednisone administration specifically on amniotic fluid volume and other parameters of fetal biophysical score.

STUDY DESIGN: Using data from a prospective double blind randomized clinical trial, 49 women with a history of recurrent pregnancy loss and at least one autoantibody were followed through their pregnancies. The participants were randomized to receive either daily Prednisone administration or placebo. The demographics of both groups were similar. A paired student t-test and Wilcoxon rank sums test were used.

RESULTS: 24 of 25 patients in the treatment group and 24 of the 25 patients in the placebo group had at least 4 parameters of the modified BPS. Specifically, there was no significant difference in the amniotic fluid volume of the two groups.

CONCLUSION: In contrast to previous reports on the short term effects of both Betamethasone or Dexamethasone upon different parameters of the biophysical score, Prednisone did not appear to affect these parameters. This is probably explained by the limited transfer of Prednisone across the placenta.
577 SCREENING ULTRASOUND for DOWN'S SYNDROME (S.U.D.S.): A PROSPECTIVE STUDY IN THE ADVANCED MATERNAL AGE POPULATION-REVISITED.


OBJECTIVES: To prospectively evaluate the sensitivity and specificity of a simple screening ultrasound protocol for Trisomy 21 (T21) in the Advanced Maternal Age (AMA) population.

STUDY DESIGN: All patients coming for genetic amniocentesis for AMA alone were approached for this study. If enrolled, the patient had the following markers of aneuploidy sought for and recorded: 1) Humera and Femur/Foot Ratio (HFFR), 2) Nuchal thickness (NT) in the transverseplane, and 3) Obvious structural congenital anomalies (hydrops, cystic hygroma, abdominal wall defects, open neural tube defects, choroid plexus cysts, echogenic bowel for example) excluding cardiac. Fetal karyotype was available for all participants. The screen was considered positive if 1) HFFR < 1.75, 2) NT > 5 mm or any obvious anomaly (3). Results were correlated to fetal karyotype when data was gathered and entered.

RESULTS: 1194 patients had a completed ultrasound screen as described. There were 17 T21. The SUDS was positive in 14 of 17 T21 (Sensitivity = 82%). SUDS was negative in 1065 of 1177 fetuses. (Specificity = 86%). When ROC curves were done for each of the 5 markers, HFFR was the weakest. Reanalysis of Proximal bone ratios found that of the 3 possible ratios: 1) HFFR, 2) Femur/Foot Ratio (FFR), and 3) Humera/Foot Ratio (HFR), the HFR had the highest likelihood ratio (L)). Using a HFR cutoff of 0.85 instead of HFR < 1.75, the specificity was greatly improved. Using the modified SUDS protocol in 1197 patients with complete data, Sensitivity was 83% (14 of 18 DS) with a Specificity of 96% (1069 of 1197).

CONCLUSIONS: In its original form, SUDS has a Sensitivity of 85% and a Specificity of 96%. Using modified SUDS, the Sensitivity is maintained (84%) but there is great improvement in Specificity (96%). SUDS may be useful as an alternative to amniocentesis in the AMA population.

578 INTRAUTERINE DECOMPRESSION OF FETAL HYDROCEPHALUS USING THE VENTRICULO-AMNIOTIC SHUNT. K. Szaflik*, J. Wolf, J. Walszyński. Department of Ultrasonography in Obstetrics and Gynecology, Department of Pediatric Neurosurgery, Research Institute Polish Mother's Memorial Hospital, Łódź, Poland

OBJECTIVE: Ultrasonography allows diagnosis of fetal hydrocephalus already between 15th and 18th week of gestation. Because of its severity and complexity, hydrocephalus is difficult diagnostic and therapeutic problem.

STUDY DESIGN: In our Department 30 fetuses with congenital hydrocephalus have been decompressed intrauterine. Shunts were already between 15th and 20th week of gestation (range 33 - 38 weeks). The minimum drainage time was 111 hours while major GU anomalies did not change significantly.

RESULTS: Of the 24,731 USN reviewed, 7,086 exams on 3,466 women were analyzed. Of these, 1,203 (10.5%) were anomalously increased, while major GU anomalies did not change significantly.

CONCLUSIONS: Early bladder drainage (before the 24th week of gestation) enables diagnosis of newborns with a good perinatal outcome, without pulmonary hypoplasia. This method of therapy limits renal damage and allows time for normal development of the fetal lungs.

579 FETAL BLADDER CATHERISATION IN SEVERE OBSTRUCTIVE UROPATHY BEFORE THE 24TH WEEKS OF PREGNANCY. K. Szaahik*, J. Walszyński, D. Borowski*, Research Institute Polish Mother's Memorial Hospital, Lódź, Poland

OBJECTIVE: Fetal obstructive uropathy is simple to diagnose before the 24th week of gestation. Drainage of the pathologically enlarged fetal bladder prevents development of hydrocephalus and destruction of kidneys and, obviously, prevents development of secondary oligohydramnios and pulmonary hypoplasia.

STUDY DESIGN: From January 1997 we diagnosed 6 cases of fetal obstructive uropathy before 24th week of gestation. In all cases oligohydramnios or oligohydramnios and pulmonary hypoplasia was also observed. After evaluation of the renal function on the basis of fetal urine samples we shunted 5 fetuses.

After routine preparation of operative field a special puncture needle was put through abdominal walls of mother and fetus into the fetal bladder. Through the needle a fetal bladder catheter was inserted between the fetal bladder and the amniotic sac. After shunt placement, fetal urine fills the amniotic sac and the fetal bladder is decompressed. After the procedure the patients were hospitalized and serial sonographic examinations were performed to evaluate shunt function. Bladder size, presence and size of hydrocephalus and volume of amniotic fluid were evaluated.

RESULTS: The Rocket Medical catheters have an excellent "shape memory". All but 1 newborns had a good perinatal outcome. Mean Apgar score was 8 points at 1 minute, weight at delivery was 1700 - 3100 grams. No pulmonary hypoplasia was observed. All deliveries were after the 33rd week of gestation (range 35 - 38 weeks). The minimum drainage time was 11 weeks, maximum 18 weeks. In 2 cases premature delivery occurred because of premature rupture of the membranes. One newborn died of respiratory distress syndrome.

CONCLUSIONS: Early bladder drainage (before the 24th week of gestation) enables diagnosis of newborns with a good perinatal outcome, without pulmonary hypoplasia. This method of therapy limits renal damage and allows time for normal development of the fetal lungs.
GASTROCHISIS AND TEENAGE PREGNANCY: A LOCAL GEOGRAPHIC STUDY IN EASTERN NORTH CAROLINA. H. Hardi, D. Strickland. Dept. of Ob/Gyn, East Carolina University School of Medicine, Greenville, NC.

OBJECTIVE: Our purpose was to examine the role of maternal age on the incidence of gastrochisis in a local homogeneous geographic area.

STUDY DESIGN: In a retrospective study the total number of deliveries between 1990-1997 were obtained using NC vital statistics. Total number of gastrochisis were reviewed and maternal characteristics, i.e., age, parity, education level, gestational age at delivery, birth weight, history of smoking cigarettes and use of illicit drugs as well as maternal complications of pregnancy were studied using maternal obstetric records.

RESULTS: There were a total of 272,000 live births during the study period. Fifty-three cases of fetal gastrochisis were identified (0.19/1000 live births). Maternal age distribution and cases of gastrochisis were as follows: age 15-19, 28 cases; age 20-24, 18 cases; age 25-19, 4 cases; age >30, 3 cases. The incidence of gastrochisis was significantly higher in maternal age of 15-19 years. Incrasing maternal age was associated with decreasing number of gastrochisis. The incidence of preterm labor was 55% vs. 12% in normal population. There were 18 (35.9%) fetal growth restriction.

CONCLUSION: This study shows that gastrochisis is most commonly seen in teenage pregnancies. Association of this condition with preterm deliveries and fetal growth restriction is significant. There is an increasing incidence of gastrochisis associated with cigarette smoking during pregnancy. However, distribution of cigarette smoking in different age groups was not significantly different.
587 CORRELATION OF SONOGRAPHIC SIGNS OF ABRUPTIO PLACENTA WITH PERINATAL OUTCOME IN PATIENTS PRESENTING WITH VAGINAL BLEEDING. L. Im, AM Vintzileos, ER Guzman, SW Shen-Schwarz, CV Ananth*. (SCMUH, Robert Wood Johnson Medical School, New Brunswick, NJ)

OBJECTIVE: To determine if the sonographic diagnostic accuracy of abruptio placenta (AP) is compromised in patients with premature rupture of the membranes (PROM).

STUDY DESIGN: This prospective study (1/97-8/98) enrolled patients presenting with vaginal bleeding in the 2nd or 3rd trimesters of pregnancy. Targeted ultrasounds (US) were performed every 3-4 days on undelivered patients to detect the presence of the following sonographic signs of AP: 1) pre-placental collection, 2) retroplacental collection, 3) marginal collection, 4) subchorionic membrane thickening, and 5) intra-amniotic hematoma. A positive US was defined as the presence of one or more of the above findings. Only the findings of the last sonogram were used to determine the presence of AP. Perinatal outcomes were defined as gestational age and birth weight at delivery, rate of low birth weight (LBW, <2500 grams), rate of preterm births (<37 weeks), Apgar scores (1 and 5 minutes) and method of delivery.

RESULTS: The diagnostic efficiency of targeted US was not affected by PROM, as seen in either the delivering obstetrician or by a single placental pathologist. Significance in AP was defined as the presence of any one of the above findings, confirmed at Caesarean section or by the delivering obstetrician. Perinatal outcome measures between positive and negative US findings for AP are shown in the table below.

<table>
<thead>
<tr>
<th>Perinatal outcome</th>
<th>Positive US</th>
<th>Negative US</th>
<th>OR (95% CI)</th>
<th>P value</th>
</tr>
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<tbody>
<tr>
<td>Birth weight (gms)</td>
<td>4400 (50%)</td>
<td>2900 (48%)</td>
<td>1.2 (0.9-1.5)</td>
<td>0.23</td>
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<td>Rate LBW (&lt;2500 gms)</td>
<td>21 (48%)</td>
<td>18 (42%)</td>
<td>1.2 (0.7-1.9)</td>
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<td>Rate PTB (&lt;37 wks)</td>
<td>29 (68%)</td>
<td>14 (32%)</td>
<td>2.8 (1.6-5.0)</td>
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<td>Rate Cesarean birth</td>
<td>26 (59%)</td>
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CONCLUSIONS: Patients presenting with vaginal bleeding and positive US signs of AP were more likely to have fetuses with lower gestational age at birth and lower birth weights at delivery, rate of preterm births, LBW, Apgar scores, and rate of Cesarean deliveries. Therefore, when US is positive in AP patients with vaginal bleeding, close surveillance is indicated.

588 THE SONOGRAPHIC DIAGNOSTIC ACCURACY OF ABRUPTIO PLACENTA VS. CONTACT MEMBRANES. L. Im, SW Shen-Schwarz, CV Ananth*, CV Vintzileos, ER Guzman, AM Vintzileos, R Guzman, SCMUH, Robert Wood Johnson Medical School, New Brunswick, NJ

OBJECTIVE: To determine if the sonographic diagnostic accuracy of abruptio placenta (AP) is compromised in patients with premature rupture of the membranes (PROM).

STUDY DESIGN: This prospective study (3/97-8/98) enrolled patients presenting with vaginal bleeding in the 2nd or 3rd trimesters of pregnancy. Targeted ultrasounds (US) were performed every 3-4 days on undelivered patients to detect the presence of the following: 1) pre-placental collection, 2) retroplacental collection, 3) marginal collection, 4) subchorionic membrane thickening, and 5) intra-amniotic hematoma. A positive US was defined as the presence of one or more of the above findings. Only the findings of the last sonogram were used to determine the presence of AP. Perinatal outcomes were defined as gestational age and birth weight at delivery, rate of low birth weight (LBW, <2500 grams), rate of preterm births (<37 weeks), Apgar scores (1 and 5 minutes) and method of delivery.

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CONCLUSIONS: Patients presenting with vaginal bleeding and positive US signs of AP were more likely to have fetuses with lower gestational age at birth and lower birth weights at delivery, rate of preterm births, LBW, Apgar scores, and rate of Cesarean deliveries. Therefore, when US is positive in AP patients with vaginal bleeding, close surveillance is indicated.

588 THE VALUE OF A COMPLETE SONOGRAPHIC SURVEY IN DETECTING FETAL ABNORMALITIES. L. Im, AM Vintzileos, ER Guzman, SW Shen-Schwarz, DL Day-Salvatorex, UMNNJ, Robert Wood Johnson Medical School, New Brunswick, NJ

OBJECTIVE: To determine if the sonographic diagnostic accuracy of abruptio placenta (AP) is compromised in patients with premature rupture of the membranes (PROM).

STUDY DESIGN: This prospective study (3/97-8/98) enrolled patients presenting with vaginal bleeding in the 2nd or 3rd trimesters of pregnancy. Targeted ultrasounds (US) were performed every 3-4 days on undelivered patients to detect the presence of the following sonographic signs of AP: 1) pre-placental collection, 2) retroplacental collection, 3) marginal collection, 4) subchorionic membrane thickening, and 5) intra-amniotic hematoma. A positive US was defined as the presence of one or more of the above findings. Only the findings of the last sonogram were used to determine the presence of AP. Perinatal outcomes were defined as gestational age and birth weight at delivery, rate of low birth weight (LBW, <2500 grams), rate of preterm births (<37 weeks), Apgar scores (1 and 5 minutes) and method of delivery.

RESULTS: The diagnostic efficiency of targeted US was not affected by PROM, as seen in either the delivering obstetrician or by a single placental pathologist. Significance in AP was defined as the presence of any one of the above findings, confirmed at Caesarean section or by the delivering obstetrician. Perinatal outcome measures between positive and negative US findings for AP are shown in the table below.

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<thead>
<tr>
<th>Perinatal outcome</th>
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<th>OR (95% CI)</th>
<th>P value</th>
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<tr>
<td>Birth weight (gms)</td>
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<td>1.2 (0.9-1.5)</td>
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<td>0.70</td>
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<td>Rate PTB (&lt;37 wks)</td>
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OBJECTIVE: There is increased perinatal morbidity related to the diagnosis of a two vessel umbilical cord. The goal of this study is to evaluate the accuracy of antenatal ultrasound in diagnosing a two vessel umbilical cord.

STUDY DESIGN: Antenatal ultrasound exams over a ten year period at two tertiary referral centers were reviewed to identify pregnancies with a diagnosis of a two vessel umbilical cord (2VC). 112 cases of 2VC with complete follow-up available were identified. The obstetrical charts, neonatal charts, and placental pathology reports were reviewed to confirm the number of vessels in the umbilical cord and the associated fetal anomalies.

RESULTS: Of the 112 cases of 2VC identified on antenatal ultrasound, 70 cases were confirmed postnatally. The positive predictive value of ultrasound diagnosis of 2VC was 62.5%. The false-positive rate was 37.5%. In 2 cases, the pathology of the umbilical cord revealed portions with 2 vessels and other portions with 3 vessels.

CONCLUSION: There is a significant false-positive rate of a 2VC following in-utero ultrasound diagnosis. This indicates the need for improved methods for diagnosis. The umbilical cord should be imaged at various sites to easily branch and fusion of the umbilical artery. Increased accuracy of the diagnosis of 2VC will allay undue concern in many cases and allow appropriate fetal surveillance when indicated.


OBJECTIVE: Non-invasive screening for Down syndrome in twin gestations is controversial. Multiple gestations in which one fetus is normal and the other fetus has Trisomy 21 comprise a unique cohort in which to study ultrasonographic markers of Trisomy 21. We used this cohort to evaluate the ability of ultrasound to identify Trisomy 21 in a multiple gestation.

STUDY DESIGN: Twenty-six women with multiple gestations presenting to two tertiary referral centers for second trimester selective termination were evaluated. There were 25 twin gestations with one fetus having Trisomy 21 and one triplet gestation with two Trisomy 21 fetuses. The ultrasounds performed immediately before selective termination were reviewed. For each Trisomy 21 euploid fetus, a paired t-test was used to compare established ultrasonic markers for Trisomy 21.

RESULTS: The mean gestational age at ultrasound was 19.6 weeks. When compared to its normal coexisting fetus, the Trisomy 21 fetus had a smaller biparietal diameter (BPD), shorter femur length (FL), shorter humerus length (HL), and increased frequencies of mild ventriculomegaly and observed/expected FL ratio <0.9:1.

<table>
<thead>
<tr>
<th>Normal Fetuses (N = 26)</th>
<th>Trisomy 21 Fetuses (n = 27)</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>mean BPD</td>
<td>45.5 mm</td>
<td>44 mm</td>
</tr>
<tr>
<td>mean FL</td>
<td>29.4 mm</td>
<td>26.8 mm</td>
</tr>
<tr>
<td>mean HL</td>
<td>29.5 mm</td>
<td>26.7 mm</td>
</tr>
<tr>
<td>Mild Ventriculomegaly</td>
<td>(astra 10-15 mm)</td>
<td>0%</td>
</tr>
<tr>
<td>Observed/expected FL</td>
<td>40.7%</td>
<td>81.5%</td>
</tr>
</tbody>
</table>

*Paired t-test
**Fisher exact test

An intrapair femur length difference of ≤3 mm detected 29.0% of Trisomy 21 fetuses. A humerus length difference of ≤3 mm detected 60.0% and ventriculomegaly detected 32%. Using the presence of any one of these markers predicted 74% (20/27) of the Trisomy 21 fetuses. The specificity was 100% resulting in no false-positive diagnoses.

CONCLUSION: In twin gestations, ultrasound evaluation, with particular emphasis on twin pair differences, has a sensitivity of 74% in identifying Trisomy 21 fetuses. If prospectively proven in the general population, these intrapair differences may be exploited to modify the Trisomy 21 risk in twins.

OBJECTIVE: To report the fetal and neonatal outcome in 500 fetuses with intracardiac echogenic foci (IEF).

STUDY DESIGN: 1) Chromosomal studies and comprehensive ultrasounds were performed on 500 fetuses with echogenic foci within the heart. 2) Maternal TORCH serologies were obtained in 112 cases. 3) The incidence of aneuploidy in fetuses with isolated IEF were compared to the incidence in fetuses with associated anomalies.

RESULTS: Isolated IEF were detected in 412 fetuses (82.4%). 91% of IEF were located in the left ventricle; while 7% were in the right ventricle, and 2% were in both ventricles. In 88 cases (17.6%), IEF were associated with other abnormalities (pyle ASIC, short femurs, cystic hygromas, choroid plexus cysts, etc.). Two out of 412 fetuses with isolated IEF had aneuploidy (0.48%) versus 6 out of 88 (6.8%) with associated anomalies (p<0.001). No association was found between with location of IEF within the heart and aneuploidy. Viral studies were negative in all cases.

CONCLUSIONS: Isolated IEF do not seem to be a risk factor for fetal aneuploidy. IEF in combination with other anomalies are an indication for karyotyping.

TRANVAGINAL SONOGRAPHIC DETECTION OF FETAL CARDIAC ANOMALIES AT 14-16 WEEKS GESTATION. EZ Zimmer, M. Brutschine1 Dept Ob/Gyn, Ramhan Medical Center, Haifa, Israel.

OBJECTIVE: To assess the incidence of fetal cardiac anomalies detected by transvaginal ultrasound (TVS) in early pregnancy.

STUDY DESIGN: A detailed TVS examination was performed in 29,984 consecutive pregnant women at 14-16 weeks gestation. The cardio-vascular evaluation included the four chamber view and the inlet and outlet tracts.

RESULTS: 149 fetuses had a cardiac anomaly (1 in 200 pregnancies), 80% were in low risk pregnancies. In 90 fetuses (60%) there were no associated anomalies, while in 42 fetuses (28%) there was an associated chromosomal anomaly.

<table>
<thead>
<tr>
<th>Anomaly</th>
<th>No</th>
<th>Incidence/ pregnancies</th>
<th>% of cardiac anomalies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypoplastic left heart</td>
<td>28</td>
<td>1:1000</td>
<td>18%</td>
</tr>
<tr>
<td>Aortic arch anomaly</td>
<td>21</td>
<td>1:1400</td>
<td>14%</td>
</tr>
<tr>
<td>Tetralogy of Fallot</td>
<td>19</td>
<td>1:1600</td>
<td>12%</td>
</tr>
<tr>
<td>Transposition great arteries</td>
<td>15</td>
<td>1:1200</td>
<td>10%</td>
</tr>
<tr>
<td>Congestive heart failure</td>
<td>13</td>
<td>1:2500</td>
<td>8.7%</td>
</tr>
<tr>
<td>Common A-V canal</td>
<td>10</td>
<td>1:2500</td>
<td>6.7%</td>
</tr>
<tr>
<td>Truncus arteriosus</td>
<td>8</td>
<td>1:3750</td>
<td>5.4%</td>
</tr>
<tr>
<td>Ebstein anomaly</td>
<td>3</td>
<td>1:10000</td>
<td>2%</td>
</tr>
<tr>
<td>Tricuspid atresia</td>
<td>2</td>
<td>1:15000</td>
<td>1.37%</td>
</tr>
</tbody>
</table>

Excluding cases of cardiac anomalies which are not yet detectable in utero, as well as cases of isolated ventricular septal defect, only one case of hypoplastic left ventricle was missed by TVS and diagnosed later in midpregnancy.

CONCLUSION: The detection rate of cardiac anomalies with TVS is similar to the reported detection rate with transabdominal scanning in midpregnancy. The incidence of various cardiac anomalies in early pregnancy differs from their reported incidence at birth.

DOES MATERNAL-FETAL MEDICINE CONSULTATION AND PREGNANCY SURVEILLANCE BENEFIT INFANTS WITH GASTROSCHISIS? B.K. Runyon, D.A. Terrone, C. Idler, J.E. Larmon, K.G. Perry, Jr., W.F. Roberts. Department of Ob/Gyn, University of Mississippi Medical Center, Jackson, MS.

OBJECTIVE: To determine if maternal-fetal medicine consultation and surveillance decreases the incidence of neonatal complications in infants born with gastroschisis.

STUDY DESIGN: Retrospective investigation of all infants with gastroschisis who received perinatal care at the University of Mississippi between September 1992 and June 1998. Medical records were reviewed for maternal age, gravidity, parity, gestational age at diagnosis and delivery, number of visits to a perinatal center, ultrasound findings, mode of delivery, delivery in a tertiary vs. non-tertiary care center, Apgar scores, cord pH, and neonatal morbidity including the incidence of sepsis, respiratory distress syndrome, and peritonitis, number of days of antibiotics and parenteral nutrition, and survival to discharge. Statistical analysis was performed using x^2, Fisher's exact test, and ANOVA as appropriate.

RESULTS: Thirty four infants with isolated gastroschisis were identified and analyzed. Infants who had maternal-fetal medicine consultation and surveillance prior to labor were more likely to be diagnosed by ultrasound than delivery (p<0.001), to be diagnosed earlier (19 vs 35 weeks, p<0.001), to have meconium stained amniotic fluid (92% vs 33%, p<0.001), and start enteral feedings earlier (day 17 vs day 28, p<0.001). There was no significant difference in the mode of delivery, birthweight, Apgar scores, incidence of neonatal sepsis, respiratory distress syndrome, or peritonitis, total days of parenteral feeding, total hospital days, or survival to discharge (all p values, 0.05).

CONCLUSION: There was no decrease in neonatal morbidity or improved perinatal outcome associated with maternal-fetal medicine consultation in pregnancies with isolated gastroschisis. The major role of the maternal-fetal medicine subspecialist is to confirm the diagnosis, exclude additional anomalies, and counsel the parents.

IS AMNIOCENTESIS TRULY INDICATED FOR PRENATALLY DIAGNOSED ISOLATED CLUBFOOT? P.D. Malone, D.W. Bianchi, P. Johnston, M.E. D’Alton. Division of Maternal-Fetal Medicine, Tufts University School of Medicine, New England Medical Center, Boston, MA.

OBJECTIVE: Controversy exists over whether to offer amniocentesis for fetal karyotyping when certain isolated abnormalities, such as clubfoot, are diagnosed on prenatal sonography. The objective of this study is to evaluate the necessity of offering invasive prenatal diagnosis of fetal karyotype in amniocentesis, following the prenatal sonographic diagnosis of isolated unilateral or bilateral clubfoot.

STUDY DESIGN: A database of all fetal abnormalities diagnosed by ultrasound at a single tertiary referral center from 1994 to 1998 was reviewed for the diagnosis of either unilateral or bilateral clubfoot. All fetuses with additional prenatally diagnosed anomalies following targeted sonographic fetal anatomy survey were excluded. Outcome results obtained included fetal karyotype, as diagnosed by amniocentesis, or newborn physical examination, as performed by a pediatrician.

RESULTS: During the 5 year study period, 4,864 fetal abnormalities were diagnosed at this center, from a total of over 27,000 targeted prenatal ultrasound examinations. In this database there were 48 cases of isolated clubfoot. The mean maternal age at diagnosis was 30.5 years. Twenty-one of the 48 patients (44%) were at high risk for aneuploidy based on maternal age or abnormal serum screening. Six patients (13%) had a strong family history of clubfoot. There were 17 (35%) cases of bilateral clubfoot, and 31 (65%) cases of unilateral clubfoot. For cases of unilateral clubfoot, 18 (58%) affected the left limb and 13 (42%) affected the right limb. The male:female ratio was 1.7:1. Twenty-two fetuses (46%) had karyotype results available, all of which were normal. Outcome data for the remaining 26 infants (54%) was based on a newborn physical examination performed by a pediatrician, with no additional dysmorphic features suggestive of aneuploidy discovered in any case. Newborn physical examination confirmed the diagnosis of clubfoot in all cases.

CONCLUSIONS: Following the prenatal diagnosis of isolated unilateral or bilateral clubfoot there is no indication to offer or perform an amniocentesis, provided that a detailed sonographic fetal anatomy survey is normal and there are no other additional indications for invasive prenatal diagnosis.

OBJECTIVE: To evaluate sonography for the identification of fetal Down syndrome compared to maternal age (>34 years at estimated date of confinement) and serum screening (AFP+HCG).

STUDY DESIGN: Women with a singleton pregnancy and an indication for an antenatal ultrasound examination between 14 and 21 weeks' gestation were prospectively screened for eight potential markers of fetal Down syndrome. A positive ultrasound screen was defined as a nuchal fold >2 mm; a major congenital malformation; or any two of the following: (1) a low ratio of measured to expected femur length; (2) a low ratio of measured to expected humerus length; (3) renal pelvis dilation > 4 mm; (4) echogenic bowel; (5) a two-vessel umbilical cord; and, (6) choroid plexus cysts.

RESULTS:

<table>
<thead>
<tr>
<th>Advanced age</th>
<th>Abnormal serum screen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>Normal serum screen</td>
</tr>
<tr>
<td>Down syndrome</td>
<td>11</td>
</tr>
<tr>
<td>Down syndrome</td>
<td>2</td>
</tr>
<tr>
<td>(n = 496)</td>
<td>(n = 2961)</td>
</tr>
</tbody>
</table>

CONCLUSIONS: Ultrasound is less sensitive than age and serum screening in detecting Down syndrome and a normal ultrasound should not be used to lower risk based upon these factors. In 334 women with an abnormal ultrasound but no other risk factors, only one additional pregnancy with Down syndrome was detected.

958 SMALL FOR GESTATIONAL AGE (SGA): MALFORMED INFANTS COMPARED TO THOSE WITHOUT ANOMALIES. R.M. Ramus, D.D. McIntire*, K.J. Leveno. Dept. Ob/Gyn, Univ. Texas Southwestern Medical Center, Dallas, TX.

OBJECTIVE: To determine the incidence of SGA in infants with major or minor malformations compared to infants without anomalies.

STUDY DESIGN: Retrospective analysis of 140,522 singleton livebirths occurring during the third trimester and delivered between January 1, 1988 and December 31, 1997. Statistical analysis was performed using chi-square contingency tables. Minor malformations were defined as those not considered to be life-threatening or those not requiring major surgical procedures. SGA was defined as birthweight < 10th percentile for gestational age in our study population of normal infants.

RESULTS:

![Graph showing incidence of SGA in infants with anomalies vs. those without anomalies.]

Conclusions:

- Horizontal line = percent expected SGA in infants without anomalies
- Conclusions: Infants with major malformations were significantly more likely to be SGA between 30 and 41 weeks gestation. A similar SGA effect, though less pronounced and limited to 30 to 35 weeks, was found for infants with minor anomalies. We conclude that third trimester fetal growth is impaired in infants with either major or minor malformations.
PREGNANCY OUTCOME AFTER PRENATAL DETECTION OF UMBILICAL VEIN VARIX


OBJECTIVE: To determine whether the prenatal sonographic detection of an umbilical vein varix (UVV) is associated with other fetal anomalies or poor perinatal outcome.

STUDY DESIGN: We searched our obstetrical ultrasound database, and identified 25 cases studied between 1988 and 1998 in which an umbilical vein varix was described. We then reviewed medical records and computed data and described the 22 cases for which pregnancy and infant outcome were available.

RESULTS: In the 22 cases, 11 had a normal outcome with a full-term delivery, appropriate birth weight, and no evidence of fetal anomalies. In the remaining 11 pregnancies, the following complications were identified: preterm delivery (n=2), hypotonia (n=1), Kell immunization requiring postnatal transfusion (n=1), triploidy (n=1), multiple congenital anomaly syndromes (n=4), and isolated cardiac defects (n=2). In the absence of fetal anomalies, we did not find an increased risk of fetal demise.

CONCLUSIONS: Prenatal detection of UVV is associated with an increased risk of associated fetal anomalies, and should prompt a thorough sonographic evaluation of the fetal anatomy and consideration of karyotyping. Although we did not have cases of fetal demise in this setting, our numbers were too small to assess the risk of fetal death.

FOOT LENGTH IN FETUSES WITH SKELETAL DYSPLASIAS. N. Metwally, CV Ananth, JC Smulian, ER Guzman, AM Vintzileos. UMDNJ-Robert Wood Johnson Medical School/St. Peter’s Medical Center, New Brunswick, NJ.

OBJECTIVE: Sonographic fetal foot length (FFL) has been shown to be an accurate predictor of gestational age (GA) beyond the first trimester. Pathologists have assumed that FFL is not significantly affected by growth restriction. However, this assumption has not been studied in the antepartum period. The aim of this study was to determine whether large for gestational age (LGA) fetuses have large feet.

STUDY DESIGN: Foot length was measured by ultrasound in 5362 singleton fetuses between Oct. 1994 and Apr. 1998 in the plantar view from the heel to the first or second toe (whichever was longer). A nomogram of FFL versus GA between 15-37 weeks was constructed from our ultrasound database using the last measurement before delivery for each fetus (cross sectional design). Inclusion required concordant menstrual and ultrasound dating (within two weeks) at an initial ultrasound. Fetuses with abnormal extremities were excluded. The relationship between FFL and GA was determined by multivariable linear regression analysis and the 5th, 10th, 50th, 90th and 95th percentiles were derived. Records from 1994-1998 were retrospectively reviewed for fetuses with neonatally confirmed skeletal dysplasias who had FFL measurements available. The last measurement prior to delivery for each fetus was plotted against the 5th, 10th, 50th, 90th and 95th percentile curves as in the FFL nomogram described above. The sensitivity of FFL <10th percentile for detecting fetuses with skeletal dysplasias was determined.

RESULTS: Three hundred fetuses with skeletal dysplasias were identified [median GA (range) 25 (16-37) weeks]; achondroplasia (n=4), osteogenesis imperfecta type II (n=3), Ellis-van Creveld syndrome, hypochondroplasia, Cate-Manzke syndrome, short rib-polydactyly syndrome, chondrodysplasia punctata, and an undefined syndrome. Nine of the 13 fetuses with skeletal dysplasia had FFL measurements <10th percentile for GA (sensitivity 99%). Five out of 13 (85%) FFL measured after 28 weeks and four out of 10 (40%) FFL measured prior to 28 weeks were <10th percentile for GA. All of the 13 cases had FFL measurements 50th percentile for GA.

CONCLUSION: The majority of fetuses with skeletal dysplasias have small feet. Therefore, foot length measurements should be included in the prenatal assessment of fetuses suspected of having a skeletal dysplasia. On the other hand, FFL is not a reliable predictor of gestational age in this setting, particularly in the third trimester.

FOOT LENGTH IN THE SMALL FOR GESTATIONAL AGE FETUS. N. Metwally, CV Ananth, JC Smulian, ER Guzman, AM Vintzileos. UMDNJ-Robert Wood Johnson Medical School/St. Peter’s Medical Center, New Brunswick, NJ.

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RESULTS: In the 25 cases studied between 1988 and 1998 in which an umbilical vein varix (UVV) was described, we did not find an increased risk of fetal demise.

CONCLUSIONS: Prenatal detection of UVV is associated with an increased risk of associated fetal anomalies, and should prompt a thorough sonographic evaluation of the fetal anatomy and consideration of karyotyping.
607 ILIAC WING ANGLE MEASUREMENTS AT THREE LEVELS IN FETAL PELVIS: A PROSPECTIVE STUDY

*Santo JA, Chauhan SP, Reynolds DF, Humphrey JF, lotz JF. Spartanburg Regional Medical Center, Spartanburg, SC.

OBJECTIVE: Iliac wing angle (IWA) measurements greater than 90 degrees in the second trimester fetus has been associated with an increased risk of Trisomy 21. Our purpose was to determine if iliac wing angle measurements are dependent on the level of measurement in the fetal pelvis.

METHODS: Using axial view of the fetal pelvis, mid-trimester fetuses at risk of aneuploidy had measurements of IWA at three levels (1st - the most cephalad, 2nd - mid pelvis, 3rd - the most caudal plane). Trisomy 21 was diagnosed by karyotype from cultured amniocytes or newborn examination with karyotype if trisomy 21 was suspected based on phenotype. Repeated measures analysis of variance (RM ANOVA) with Tukey-Kramer multiple comparison post-test was used. χ² test was used for categorical variables and P < 0.05 was considered significant.

RESULTS: Over 2 years 193 patients, referred for sonographic evaluation in second trimester, underwent measurements of IWA at the three levels. The mean maternal age was 27.6 ± 7.3 years, and gestational age 19.3 ± 2.4 weeks. RM ANOVA indicates that the mean IWA at 1st, 2nd and 3rd levels (70.5 ± 19.0°, 59.9 ± 20.4° and 50.0 ± 20.7°, respectively) were significantly different from each other (P < 0.0001). The post-test indicates that the IWA at 1st vs 2nd level were significantly different (P < 0.01), as were the angles between 1st vs 3rd (P < 0.01) and 2nd vs 3rd (P < 0.01). At the 1st level 22% (45/193) of the patients had IWA > 90° at 1st (24/105) and at 2nd, 5% (10/193; p < 0.0001). Down syndrome was detected in 3(1.5%) and all three fetuses had IWA > 90° at 1st and 2nd levels; one fetus had an IWA of 70° at the 3rd level.

CONCLUSIONS: The IWA differs significantly at the three levels, as does the frequency of those who will be considered to have abnormal condition (> 90°).

608 ILIAC ANGLE AS MARKER FOR DOWN SYNDROME IN 2ND TRIMESTER: A PROSPECTIVE STUDY AT TWO COMMUNITY HOSPITALS

*Santo J, Dellinger B, Dibona D, Chauhan SP, Spartanburg Regional Medical Center, Spartanburg, SC, Greenville Hospital SC; Greenville SC.

OBJECTIVE: To ascertain if measurements of iliac wing angle (IWA), in the 2nd trimester, can identify the fetus at risk for Down syndrome (DS).

STUDY DESIGN: Prospectively at two community hospitals (1st CH, 2nd CH), 2nd trimester patients at risk for DS had axial measurements of IWA prior to genetic amniocentesis. DS was diagnosed by karyotype of cultured amniocytes or leukocytes, if indicated by neonatal examination. From the data obtained at 1st CH, a receiver-operating characteristic curve (ROC) was generated, its area (± SD) calculated and diagnostic threshold determined. These results were then applied to 2nd CH. Neither the sonographers nor the maternal-fetal medicine specialist were the same at the two hospitals. Student t test was used and p < 0.05 was considered significant. Sensitivity (Sens), likelihood ratio (LR), and true positive rate (TPR) were calculated along with their 95% confidence interval.

RESULTS: At the 1st CH, 223 patients were evaluated and among them 7 (3%) had DS. The maternal age among those with DS (31.5 ± 7.0 yr) was significantly higher than those without (25.0 ± 6.7; p < 0.008) but the gestational age (GA) was similar (p = 0.88). The IWA was significantly higher among those with DS (96.9 ± 19.5°) than those without DS (69.6 ± 21.3°; p < 0.0001). The area under the ROC (0.51 ± 0.07) was significantly different than the area under the non-diagnostic line (p < 0.005). IWA > 85° was the optimal diagnostic threshold and it's associated with a true positive rate of 71% and false positive rate of 38%. At the 2nd CH, 188 patients at risk for DS were evaluated and among them 5 (1.6%) had trisomy 21. The Sens of IWA > 85° to detect DS was 100% (29/100%), PPV 6% (1-16%), and LR 3.9. Using this threshold 16 amniocenteses would be necessary to detect each case of DS.

CONCLUSIONS: This prospective study indicates 1) IWA is a good diagnostic test for detection of DS 2) IWA > 85° is an acceptable diagnostic threshold and 3) the findings at one community hospital may be applicable at another.

OBJECTIVE: We have anecdotally observed that the visualization of echogenic intracardiac foci (EIC) depends on the orientation of the four chamber fetal heart views obtained during ultrasound examination. Since EIC are suggested to be an aneuploidy marker, we undertook this study to compare the frequency of visualization of EIC in different cardiac views.

STUDY DESIGN: Women presenting for ultrasound examination in our institution between October 1997 and July 1998 were included if EIC were visualized. The following information was recorded: maternal age, gestational age at ultrasound, number of EIC's, location (left ventricle, right ventricle or both), and the orientation of the fetal heart in which the EIC's were seen (apical or lateral four chamber heart). Both apical and lateral four chamber views were obtained in all patients regardless of the presence or absence of EIC.

Statistical analysis used the binomial test for proportions.

RESULTS: Overall, EIC's were seen in 91 fetuses. The mean (SD) maternal age was 28.6 (6.9) years, and the mean gestational age at ultrasound examination was 21.9 (4.4) weeks gestation (range 16-36 weeks). Eighty-eight fetuses (97%) had a single EIC (85 in the left ventricle (LV), 3 in the right ventricle (RV), and 3 (3%) had two EIC's (1 had 2 EIC's in the LV and 2 had 1 EIC in each ventricle). The EIC was seen in the apical four chamber view in 91 (100%) and in the lateral four chamber view in 27 (30%), (P<0.001) of which 7 (8%) were judged difficult to visualize. The EIC was not easily visualized in the lateral four chamber view in 64 (70%).

CONCLUSION: EIC's are more frequently seen in the apical four chamber view of the fetal heart than in the lateral four chamber view. Studies which suggest increased risk of aneuploidy from EIC must specify the orientation of the four chamber view used.


OBJECTIVE: The purpose of this study was to determine the correlation between lateral ventricle measurements obtained from prenatal ultrasound and post-natal imaging studies in cases of fetal ventriculomegaly.

METHODS: A retrospective chart review was undertaken of 88 cases of fetal ventriculomegaly identified in the Fetal Board database at the University of Louisville, Department of Obstetrics and Gynecology, Division of Maternal-Fetal Medicine, from 1992 to present. Complete information was obtained and statistical analysis performed on 26 cases of severe ventriculomegaly, 20 of which (81%) were associated with moderate to severe ventriculomegaly (defined as an atrial diameter of >1.5 cm). A prenatal ventriculo-peritoneal shunt was placed in 19 out of 21 of these cases. Atrial diameters were measured from the fetal ultrasound at the time of initial diagnostic ultrasound and correlated to the comparable anatomic measurements from post-natal imaging studies (computerized tomography studies were used in most cases). If the neonate was treated with a shunt, comparisons were made to both the pre-shunt and post-shunt studies. The Pearson correlation was used for statistical analysis. The sample size was sufficient to detect a correlation of 0.5 or greater with 80% power.

RESULTS: The correlation between the prenatal ultrasound atrial diameter to the initial post-natal imaging study was 0.659 (p = 0.001, n = 20) on the right and 0.521 (p = 0.009, n = 24) on the left, both statistically significant. There was no significant correlation between prenatal diameters and those measured on post treatment (those measured on post shunt imaging studies: 0.325 (p = 0.184, n = 18) on the right and 0.360 (p = 0.1) n = 18) on the left.

CONCLUSION: This study of fetuses with ventriculomegaly demonstrates a correlation between the atrial diameters measured at the time of initial diagnostic ultrasound and those obtained on initial postnatal imaging studies. This correlation dissipates when imaging is performed after shunt placement, consistent with variable response to shunting. Further studies will be needed to determine if there is a correlation between initial prenatal imaging appearance and long-term neurodevelopmental outcome.

612 THE DETECTION OF FETAL TRISOMY USING GENETIC ULTRASOUND. A. Hunt, A. Timmons, H. Brown, T. Spelbring, A Shade. Dept. Ob/Gyn, St. Vincent Hospital, Indianapolis, IN

OBJECTIVE: To determine the sensitivity of genetic ultrasound in the detection of fetal trisomy and the effect of its availability on the percentage of women requesting genetic amniocentesis.

STUDY DESIGN: Genetic ultrasonography was introduced at our institution on Jan. 6, 1977 and followed prospectively through Aug. 1, 1986. The following markers were used to screen for the presence of fetal trisomy: structural malformations, increased nuchal fold thickness, short femur, short humerus, echogenic bowel, pyelectasis, choroid plexus cysts, and finger anomalies, foot anomalies, cardiac echogenic foci, increased I/A ratio, and a 2-vessel umbilical cord.

RESULTS: 654 genetic ultrasound examinations were prospectively followed. The mean gestational age at the time of the examination was 17.8 weeks. The incidence of trisomy was 2.4%. 154 (20.5%) genetic ultrasound examinations had at least one abnormality. 227 (43.7%) patients with a normal ultrasound exam and 61 (45.5%) patients with an abnormal genetic ultrasound underwent amniocentesis. 16 trisomies were diagnosed (5 trisomy 21, 3 trisomy 13, and 3 trisomy 18). All 10 of the trisomic fetuses had two or more markers. The sensitivity, specificity, positive predictive value, and negative predictive value when one marker was present were 100%, 78.2%, 10.3%, and 100%, respectively. The false positive rate was 18.5%. The sensitivity, specificity, positive predictive value, and negative predictive value when two or more markers were present were 68.8%, 96.1%, 30.6%, and 99.2%, respectively. The false positive rate was 5.9%.

CONCLUSIONS: Genetic ultrasound is an excellent tool for screening pregnancies at risk for fetal trisomy. The percentage of women requesting amniocentesis was not reduced by the introduction of genetic ultrasonography. The false positive rate of genetic ultrasound examination can be reduced by requiring the presence of two or more markers; however, the sensitivity is compromised.
613 THE DIAGNOSTIC VALUE OF FETAL ECHOGENIC BOWEL ASSOCIATED WITH AN ELEVATED MATERNAL SERUM AFP. A. M. Siskind, D. E. Carlson, N. Greene, K. D. Gregory, C. A. Wallis, L. D. Plant. Dept. Ob/Gyn, Cedars Sinai Medical Center, UCLA School of Medicine, Los Angeles, CA.

OBJECTIVE: To determine the diagnostic value of fetal echogenic bowel (EB) associated with an elevated maternal serum alpha-fetoprotein (MSAFP) in the prediction of adverse fetal outcome.

STUDY DESIGN: The database from our institution's Prenatal Diagnosis Center was accessed for all singleton pregnancies in 1992-1997 with second trimester EB having a documented unexplained elevated MSAFP (>2.5 multiples of the median (MOM)). The incidence of perinatal mortality and morbidity was determined. Outcome was subject to Fisher's exact test for analysis; p < 0.05 was considered significant.

RESULTS: 116 cases of EB were identified. 35 of these pregnancies had a documented MSAFP result. 3 of these pregnancies were multiple gestation were included in the data analysis. Of the 30 remaining cases, 6 (20%) of the patients had an MSAFP > 2.5 MOM; 5 (50%) of which resulted in therapeutic abortions due to congenital malformations (congenital nephrotic syndrome, Dandy-Walker malformation, and multiple congenital anomalies). Of the 3 remaining fetuses, 1 (16.7%) neonatal death occurred in a fetus diagnosed with a triploid (68XXY 19 (22)); 2 (33.3%) had intrauterine growth retardation (IUGR); and 2 (33.3%) delivered preterm (<37 weeks gestation). Of the 30 singleton pregnancies with an elevated MSAFP and 4/24 (16.7%) pregnancies with EB and a MSAFP > 2.5 (p = 0.0005).

CONCLUSIONS: While only 28% of the population of fetuses with echogenic bowel in this investigation had a documented MSAFP, the identification of fetal EB associated with an unexplained high MSAFP appears to be an ominous finding in the second trimester fetus.

614 TRANSVAGINAL ULTRASOUND OF THE CERVIX IN PREGNANCIES WITH PROPHYLACTIC CERCLAGE. V. Berghella, G. Davis, R. J. Wapner. Division of Maternal Fetal Medicine, Department of Obstetrics and Gynecology, Jefferson Medical College of Thomas Jefferson University, Philadelphia, PA.

OBJECTIVE: To determine if asymptomatic pregnancies with prophylactic cerclage in place identified by transvaginal ultrasound (TVS) are at risk for preterm delivery (PTD).

STUDY DESIGN: Singleton pregnancies at high risk for PTD who received prophylactic cerclage were followed prospectively with TVs from 14 weeks gestation. Fifty women had cerclage. A dedicated 3-D vaginal probe (5.0-8.0 MHz, Voluson 530D, Medison America) was used to acquire a volume of ultrasound data, using a sagittal acquisition plane. The acquired volume was later resliced to obtain multplanar views of the cervix including the mid-sagittal, axial and the coronal plane. Using the same probe in 2-D mode, standard mid-sagittal 2DUS views were also obtained. Cervical measurements made from the 2DUS sagittal images and 3DUS sagittal and coronal images were compared for cervical length (CL), cervical width, funnel length, and funnel width. A 5 mm difference was considered significant. Cervix location was assessed on both 2DUS and 3DUS.

RESULTS: Of the 29 CI measurements in 3DUS sagittal plane, 6/29 were shorter and 2/29 were longer than in 2DUS varying by 1-17 mm, indicating that the true mid-sagittal plane was not obtained in 8/29 (27%) of 2D scans. Funneling was seen by both 2DUS and 3DUS in 8/17 exams; in 9 cases it was depicted only on 3DUS (6 on sagittal and coronal; 3 on coronal only). In 3DUS the cerclage was seen in its entirety in 6/9 (69%) exams in the axial plane.

CONCLUSIONS: 3DUS may offer more accurate and complete assessment of the cervix than 2DUS. 3DUS more completely visualized cervical cerclages in the reformatted axial plane. Funneling is seen more frequently with 3DUS but the clinical significance of funneling seen only in the coronal plane is unknown.
617 FETAL CNS ANOMALIES REVEALED WITH ULTRAFAST MR IMAGING. Deborah Levine, MD×, Patrick D. Barnes, MD×, Jodi Abbati, MD, Geoffrey P. Wong, MD, Robert R. Edelman, MD×, Dept Radiology and Ob/Gyn, Beth Israel Deaconess Medical Center, Boston, MA, Dept Radiology, Children’s Hospital, Boston, MA.

OBJECTIVE: Our purpose was to identify in which cases use of MRI can add additional information to that provided by sonography in fetuses with sonographically suspected CNS abnormalities.

METHODS: 53 women underwent MR examinations of the fetal CNS. Indications for examination were ventriculomegaly (N=19), suspected neural tube defect (N=11), large cysterna magna (N=46), cyst in brain (N=4), at risk for CNS anomaly (high AFP, teratogen, family history, N=4), small head (N=2), and miscellaneous (N=7).

RESULTS: Additional findings on MR compared to US were seen in 9 cases referred for VR (small cerebellum, multifocal hemorrhage, porencephaly, agenesis of the corpus callosum, partial agenesis of the septum pellucidum); in none of the cases of neural tube defect (although the normal appearing brain in one patient with a small encephalocele helped the patient decide to continue the pregnancy); MR findings not visualized with US included agenesis of the corpus callosum (N=5), cerebellar hypoplasia (N=2), cortical cleft (N=2), porencephaly (N=2), partial agenesis of the septum pellucidum (N=2) and one case each of polymicrogyria, holoprosencephaly, and multifocal hemorrhage. In two cases MR confirmed presence of corpus callosum in patients suspected to have absent corpus callosum. In all cases MR visualized the region of abnormality or suspected abnormality. In 25/53 cases (47%) the additional information provided by MR was of the type which changes patient counseling.

CONCLUSION: When a CNS anomaly is detected or suspected by US, then MR may demonstrate additional findings which can alter patient management.

618 ERROR IN UTERINE ARTERIAL Doppler ASSESSMENT CAUSED BY DIFFERENCES IN THE WAVEFORM OF THE UTERINE AND CERVICAL ARTERIES. W.H. Persutti×, J.C. Hobkins, Dept of Obstetrics and Gynecology, University of Colorado Health Sciences Center, Denver, CO.

OBJECTIVE: Doppler analysis of the uterine arteries in pregnancy is useful in screening for patients at risk for IUGR and preeclampsia. Generally, uterine arterial Doppler (UdD) evaluation is thought to be uncomplicated and results reproducible. Potential sources of error in UdD interrogation are from sampling the wrong vessel or sample site. Pelvic Doppler waveforms can be obtained from both the uterine artery (UA) and the cervical artery (CA). Using pulsed Doppler, we compared arterial blood flow from the UA with that from the CA.

STUDY DESIGN: In January 1998, we prospectively evaluated the UA and CA Doppler waveforms of 20 randomly selected uncomplicated pregnant patients between 18 and 30 weeks of gestation. The evaluation was performed with a state-of-the-art, commercially available ultrasonographic system (HDI 5000, Bothell, WA). In our opinion, this system was uniquely suited to perform such an evaluation because of its superior Color Doppler sensitivity. Resistivity Indices of bilateral uterine and cervical arteries were obtained (Figure 1). For analysis, we compared only the findings of the vessels on the right side of the pelvis. RI values were compared using a paired Signed Rank Test and a p<0.05 was considered significant.

RESULTS: In all cases, we found the Resistivity Index of the UA to be lower than the CA. Analysis of the pairs showed a significant difference (p<0.002). Collectively, the mean UA measurement (0.52 and range 0.35-0.70) was significantly lower than that of the CA (0.72 and range of 0.55-0.82; p<0.0001).

CONCLUSIONS: This study reveals a significant potential source of error in UdD assessment. Early Doppler studies were performed with non-imaging continuous-wave Doppler. Using that technology the precise site of sample is unknown and could have resulted in sampling the wrong vessel. If the UA was incorrectly evaluated in UdD, the normally high RI of the CA may have resulted in significantly overestimating the false positive rate in screening for late pregnancy complications.

619 QUADRUPLE SCREEN: ULTRASOUND BIOMETRY, SERUM MARKERS, AND AGE FOR DOWN SYNDROME. RO Bahado-Singh, U Oz×, E S. Gomez, O Deren×, E Kovanch×, J.C. Hobbins, Dept of Obstetrics and Gynecology, University of Colorado Health Sciences Center, Denver, CO.

OBJECTIVE: To compare the Down Syndrome screening efficiency of the standard serum triple analyte screen, to a quadruple screen which consists of a combination of ultrasound biometry and serum markers in the mid-trimester.

STUDY DESIGN: The Down syndrome screening efficiency of the triple screen (AFP, hCG, uE3 and maternal age) was compared to the quadruple marker algorithm, i.e., humerus length (HL), nuchal thickness, AFP, hCG, and maternal age. Receiver operator characteristics (ROC) curves were constructed for each algorithm and the areas under the curves were compared to determine which was superior. The sensitivity and false positive rates at different Down syndrome risk thresholds were also compared.

RESULTS: There were 35 Down syndrome and 2054 normal singleton pregnancies in which the triple screen and fetal biometry and karyotyping had been obtained. The gestational age range for the study was 14-22 weeks. The area (SE) under the ROC curves for Down syndrome detection were 0.8120 (0.04) and 0.9427 (0.02) for the standard triple vs the quadruple screen respectively. The difference was statistically very significant (p<0.00001). At a Down syndrome risk threshold of > 1/100 the sensitivity and false positive rates were 71.1% and 24.7% respectively for the standard triple screen while the corresponding values for the quadruple screen were 82.9% and 7.2% respectively.

CONCLUSION: A new algorithm combining humerus length and nuchal thickness measurement with serum AFP and hCG substantially improves the Down syndrome screening efficiency compared to the traditional triple screen. The superiority of the new screen was confirmed statistically. It appears to increase the detection rate while reducing the false positive rate compared to the triple screen. This algorithm should be evaluated for use in high-risk women who either decline or are reluctant to undergo genetic amniocentesis and want further refinement of their Down syndrome risk.


OBJECTIVE: To determine the screening efficiency of mid-trimester urinary β-core fragment hCG for subsequent IUGR and to compare its performance with serum AFP, hCG and uE3.

STUDY DESIGN: Urine β-core fragment was measured prospectively from patients < 20 weeks gestation in a prospective, randomized, double-blind study over 3 years. A single sample of maternal mid-trimester urine was obtained. A control group of patients with normal singleton fetuses was enrolled prospectively. The control group was compared to a group of patients who subsequently delivered preterm infants (< 37 weeks gestation), large for gestational age infants (> 90th percentile), or infants with IUGR. Statistical analysis was performed using the χ2 test and Student's t-test as appropriate.

RESULTS: There were 23 cases of IUGR (3.0%). The mean (±SD) gestational age at urine screening was 16.4 (1.3) weeks and the interval to delivery was 23.0 (2.2) weeks. There was a very significant correlation between elevated β-core fragment level and IUGR (Mantel - Haenszel test of linear association, p<0.000001). At a β-core level ≥ 2.0 MoM the RR (95% CI) was 2.9 (2.2 - 3.8). We found a 78.3% sensitivity and 70% specificity for IUGR. The area under the ROC curve for IUGR screening was 0.814 (p<0.00001). The strong association with IUGR persisted when pre-eclampsia were excluded. Among those also having a triple screen, stepwise logistic regression revealed β-core fragment to be the only significant independent marker (Chi-Square = 18.36, p<0.00001). In addition, an ROC curve was plotted based on different β-core fragment hCG threshold levels. In 19 patients serum triple screen was also obtained and backward stepwise logistic regression analysis was performed to determine the significant urine and serum analytes for IUGR detection.

CONCLUSIONS: There were 23 cases of IUGR (3.0%). The mean (±SD) gestational age at urine screening was 16.4 (1.3) weeks and the interval to delivery was 23.0 (2.2) weeks. There was a very significant correlation between elevated β-core fragment level and IUGR (Mantel - Haenszel test of linear association, p<0.00001). At a β-core level ≥ 2.0 MoM the RR (95% CI) was 2.9 (2.2 - 3.8). We found a 78.3% sensitivity and 70% specificity for IUGR. The area under the ROC curve for IUGR screening was 0.814 (p<0.00001). The strong association with IUGR persisted when pre-eclampsia were excluded. Among those also having a triple screen, stepwise logistic regression revealed β-core fragment to be the only significant independent marker (Chi-Square = 18.36, p<0.00001). In addition, an ROC curve was plotted based on different β-core fragment hCG threshold levels. In 19 patients serum triple screen was also obtained and backward stepwise logistic regression analysis was performed to determine the significant urine and serum analytes for IUGR detection.

CONCLUSION: Mid-trimester urine β-core fragment hCG had a high screening efficiency for IUGR comparable to that often reported in the third trimester ultrasound. It also proved to be superior to maternal serum analytes. Urine β-core fragment hCG appears to be a promising new tool for the early prediction of IUGR in a low risk population.
621 UMBILICAL ARTERY WAVEFORM NOTCHING: IS IT A MARKER FOR CORD AND PLACENTAL ABNORMALITIES? A. Abuhamad, A. Scharer*, M. Aguirre*, R. Morriani*, Dept. Ob/Gyn & Pathology, Eastern Virginia Medical School, Norfolk, VA.

OBJECTIVE: To determine whether umbilical artery waveform notching (UAN) on Doppler velocimetry is predictive of cord and placental abnormalities.

STUDY DESIGN: During a 6-month period, Doppler ultrasound of the umbilical artery was prospectively performed on all patients undergoing ultrasound examination at our facility at > 27 weeks gestation. Exclusions were maternal vascular disease, multiple gestations and fetal growth and morphologic abnormalities. A control group of patients with normal umbilical artery Doppler velocimetry was randomly selected for comparison. Obstetric and neonatal outcome variables, as well as detailed pathologic examination of the cord and placentas, were obtained on all controls and pregnancies with UAN.

RESULTS: A total of 1,256 ultrasound examinations were performed during the study period. Of those, 24 (1.8%) pregnancies had UAN. Patients with UAN had similar gestational age at diagnosis, gestational age at delivery, and neonatal birth weights compared to controls. Pregnancies with UAN had significantly increased cord and placental abnormalities including: 11/24 (45.8%) abnormal cord insertions (9 eccentric, 3 marginal), 5/24 (21%) accessory placental lobes, 3/24 (12.5%) cord knots (2 false, 1 true), 2/24 (8%) cord strictures, 1/24 (4%) marked cord edema and 1/24 (4%) subamniotic placental cyst.

CONCLUSION: In our study population UAN is a strong predictor of cord and placental abnormalities. To our knowledge, this is the first report of such association.

623 THE USE OF ACOUSTIC STIMULATION TO INSPECT THE FETAL MOUTH. Lee KY, Jang FR, Jun HA, Lee KI, Nagey DA. Dept. Ob/Gyn, Hallym University, Seoul, Korea, and The Johns Hopkins University, Baltimore, MD.

OBJECTIVE: Sonographic examination of the fetal mouth is facilitated if the mouth is open or moving. This study was designed to determine whether acoustic stimulation of the fetus would cause it to move its mouth.

STUDY DESIGN: 109 women with uncomplicated pregnancies between 20 and 39 weeks gestation consented to participate in this study. After routine sonographic evaluation of the fetal face and mouth was performed, the fetal mouth was observed for 5 minutes before and after vibratory acoustic stimulation was applied to the maternal abdomen near the fetal head. Stimulation was accomplished with a 74dB for 3 seconds. Fetal mouth movement was then classified as none, rhythmic lip movement, rhythmic jaw movement, and mouth opening. Withdrawal of the fetal hand from the mouth was also studied. All analysis were performed by studying videotapes of the procedure. Statistical analysis was performed by the Mann-Whitney U-test since the data are likely not normally distributed.

RESULTS: 18 of the 109 infants were excluded as fetuses were in fetal position or maternal body habitus precluded adequate examination of the fetal mouth for the 10 minute study. None of the fetuses exhibited no mouth movement. The average time to first fetal mouth opening after acoustic stimulation was 78 seconds with a range of 3 to 290 seconds. Hand withdrawal occurred in 64% after acoustic stimulation compared with 43% observed in the 5 minutes prior to acoustic stimulation.


OBJECTIVE: Because abdominal contents herniate into the thorax, it is uncertain whether standard tables of fetal abdominal circumference (AC) measurements are valid with congenital diaphragmatic hernia (CDH). Our objective was to determine whether AC measurements are significantly smaller in these fetuses.

STUDY DESIGN: Ultrasonic reports of fetuses with postnatal confirmation of CDH from 1995-1998 were reviewed for biometric confirmation of CDH from 1995-1998 were reviewed for biometric measurements between 16-39 weeks gestational age (GA). The AC measurements vs GA were plotted, and the growth curve compared that of Hadlock et al (AJR 139:367;1982). The mean AC measurement at each week was compared to the corresponding data from Hadlock et al. To assure that these fetuses were appropriately grown, birthweights were compared to the normal range for GA.

RESULTS: There were a total of 166 AC measurements in 36 fetuses (mean 4.6 measurements per fetus). The plots of AC vs GA were similar to the expected AC values. Analysis of the subgroups showed that there was no difference in AC measurements related to side of CDH (left vs. right). Presence of liver herniation into the thorax was not associated with smaller AC measurements. At each week, the AC measurements were not significantly smaller than normal values. Analysis of the subgroups showed that there was no difference in AC measurements related to side of CDH (left vs. right). Presence of liver herniation into the thorax (n=21), or in utero fetal treatment with tracheal occlusion (n=11). All newborns had birthweights falling between the 10th and 90th percentile for GA at delivery.

CONCLUSION: Ultrasonographic measurements do not appear to underestimate the true AC in fetuses with CDH. In otherwise normally grown fetuses with CDH, the measured AC should not be expected to deviate significantly from published norms regardless of side of diaphragmatic hernia, degree of liver elevation, or in utero treatment with tracheal occlusion.

STUDY DESIGN: This historical cohort study was based on 1,564 twin pregnancies between 32 and 39 weeks gestation from Baltimore, Miami, Charleston, and Ann Arbor. Intrauterine growth, based on ultrasonographic fetal weight measures, was modeled as a function of gestational age for each infant. Regression models with quadratic terms and no intercept were found to fit the growth pattern well. However, the ultrasonographic fetal weight measures near birth suggested a proportional bias (usually overestimating weight by 3-8%), depending on study site) compared to actual birthweights. The bias was estimated for each twin pair as the ratio of predicted fetal weights at birth based only on ultrasonographic measurements versus the actual birthweights. The intrauterine growth curves were then corrected for this bias, forcing the regression curve through the actual birthweight.

RESULTS: Weight percentiles (in grams) at 20, 28, and 36 weeks' gestation:

<table>
<thead>
<tr>
<th>Weeks</th>
<th>10th</th>
<th>25th</th>
<th>50th</th>
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<td>20</td>
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<td>2,152</td>
<td>2,576</td>
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CONCLUSIONS: This new standard of twin growth based on longitudinal fetal weight estimates and birthweight provides a more realistic comparison than standards based on birthweight alone. It also has an advantage over standards based on cross-sectional birthweight data because estimates at each gestational age are based on a combination of fetal and newborn measures, more accurately reflecting normal growth.

626 LOW ONE-HOUR GLUCOSE SCREENS AND INTRAUTERINE GROWTH RESTRICTION. Dooly AJ, Ural SH, Callan N, Witter F. Division of Maternal-Fetal Medicine, Johns Hopkins University School of Medicine, Baltimore, MD. OBJECTIVE: To determine if a one-hour glucose screen done between 26 to 29 weeks of gestation that is below the 5th percentile is predictive of intrauterine growth restriction (IUGR). 

STUDY DESIGN: Utilizing the Johns Hopkins Perinatal Database, deliveries for which a one-hour glucose screen was performed were retrospectively analyzed. Results from the glucose screens were categorized into percentiles. Group 1 (600 patients) had values below the 5th percentile or < 71 mg/dL. Values of 90 mg/dL to 128 mg/dL on the glucose screen comprised the 25th to 75th percentiles. Group 2 (6784 patients) had values within this range and comprised the control group. Patients in both groups were classified as having IUGR if their infants had birth weights less than the 10th percentile adjusted for gestational age, infant gender, and race. 

RESULTS: Groups 1 and 2 did not differ significantly in mean gestational age at delivery, 38.75 vs. 38.78 (student's t-test, p=NS). A significant difference was detected in the incidence of neonates weighing less than the 10th percentile when standardized for gestational age, infant gender, and race between groups 1 and 2, 16.2% vs. 12.8% (Fisher's exact test, p=0.0045). Groups 1 and 2 were comprised of unequal percentages of black patients, 83.2% vs. 68.8% (Fisher's exact test, p=0.00001). Because black race is a known risk factor for IUGR, logistic regression analysis was conducted to control for the data's racial imbalance. After adjustment for race, a one-hour glucose screen below the 5th percentile remained a significant independent risk factor for IUGR (adjusted OR=1.30, p=0.02; CI=1.04 to 1.61).

CONCLUSIONS: This retrospective analysis shows that a one-hour glucose screen below the 5th percentile is a significant independent risk factor for IUGR. We speculate that this is due to a maternal heightened sensitivity to maternal stores away from substrates required for fetal growth.

627 CONSISTENT FETAL BIOMETRY IMPROVES SONOGRAPHIC ESTI- MATE OF FETAL WEIGHT. J. Chiu, I.E. Zador, R. Chik, M.P. Dombrorski, R.J. Sokol. Dept of OB/Gyn, Hutzel Hosp./Wayne State Univ, Detroit, MI. OBJECTIVE: The widely used Hadlock's equations for estimated fetal weight (EFW) are based on sonographic measurements of fetal head, abdomen and femur. We investigated the reliability of EFW against the actual birthweight (BW) due to measurement deviations within a subject. 

STUDY DESIGN: Cases with birth dates within 7 days of EFW dates and no identified anomaly were used. Separate EFW were calculated for fetal head, abdomen and femur with equations derived from our data set. For each subject, a within subject EFW standard deviations (WSD) was then calculated. In addition, Hadlock's EFW (HEFW) and actual birth weight (BW) were compiled. The explained variances R² between BW and HEFW at different WSD cut points were compared. The hypothesis was that large WSD would result in unreliable EFW with reduced R².

RESULTS: In a data set of 1066, the mean WSD was 36±164 grams. Fifty-three cases had maternal diabetes mellitus, which did not produce confounding results.

<table>
<thead>
<tr>
<th>WSD, grams</th>
<th>&lt;100</th>
<th>100-428</th>
<th>&gt;428</th>
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<tr>
<td>Sample size</td>
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<td>1137</td>
<td>261</td>
<td>1656</td>
</tr>
<tr>
<td>R², HEFW vs BW</td>
<td>.97</td>
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</table>

CONCLUSIONS: Hadlock's EFW was most reliable (R²=.97) when the WSD was much smaller than average (<mean-lsd). When WSD was much larger than the average (>mean+lsd), the potential for an unreliable estimate of fetal weight is increased (R²=.76). Finding high variation in EFW from various fetal measurements should prompt a review of fetal biometry for measurement errors or a search for possible anatomic anomalies that could influence the measurements.

628 THE VALUE OF ULTRASOUND SURVEILLANCE OF TWIN GROWTH AFTER A NORMAL SCAN AT 20-24 WEEKS. W.A. Grobman, B.V. Parlik, Northwestern University Medical School, Chicago, IL. OBJECTIVE: To examine the interval between a normal fetal growth ultrasound at 20-24 weeks and subsequent growth abnormality in twin gestations, and to determine the positive predictive value (PPV) of that abnormal finding. 

STUDY DESIGN: All women who delivered twin gestations between January 1992 and March 1998, who had a normal fetal growth and anatomic survey on ultrasound at 20-24 weeks, and who had evidence of a subsequent ultrasound of a fetal growth abnormality were included. Growth abnormality on ultrasound was defined as either an abdominal circumference <5% or an estimated fetal weight <10% for at least one twin. Birth weights were assessed for evidence of discordance (>20% weight difference as a function of the heavier twin) and growth restriction (weight<10% according to twin growth curve criteria).

RESULTS: Of the 31 pregnancies that met inclusion criteria, the mean gestational age at the first scan was 21±1.5 weeks, and the mean interval between all subsequent scans was 3±1.9 weeks. The elapsed time until an abnormality was detected was 10±3.9 weeks. Among those pregnancies with continued normal growth at 28-32 weeks, and who had evidence of a subsequent ultrasound of a fetal growth abnormality were included. Growth abnormality on ultrasound was defined as either an abdominal circumference <5% or an estimated fetal weight <10% for at least one twin. Birth weights were assessed for evidence of discordance (>20% weight difference as a function of the heavier twin) and growth restriction (weight<10% according to twin growth curve criteria).

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OBJECTIVE: To determine the optimal gestational age for predicting birth weight (BW) by ultrasonographic measurements.

STUDY DESIGN: Patients with singleton pregnancies who underwent 2 or more third trimester sonograms between 5/1/94 and 4/30/98 formed the study group. Sonograms were divided by gestational age (GA) into 5 groups: 1) 33-36 weeks, 2) 36-39 weeks, 3) 33-35.9 weeks, 4) 36-38.9 weeks and 5) ≥39 weeks gestation. BW was predicted by the gestation-adjusted projection of estimated fetal weight (GAP) method of Mongelli and Gargioli (1996). The percent error between the predicted BW and actual BW was compared with a paired t test. This allowed each patient to serve as her own control and eliminated the potential effects of maternal body habitus and fetal proportions on the accuracy of the sonographic measurements.

RESULTS: 658 patients undergoing 1510 sonograms were included in the study. The overall accuracy of the GAP prediction of BW was similar to that originally described with an absolute error of 9.6%. The error of the predicted BW varied with GA as described in the table below.

<table>
<thead>
<tr>
<th>GA groups</th>
<th>n</th>
<th>1st GA group Mean ± error</th>
<th>2nd GA group Mean ± error</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 and 4</td>
<td>111</td>
<td>11.9 ± 8.3</td>
<td>0.0001</td>
</tr>
<tr>
<td>2 and 4</td>
<td>185</td>
<td>11.0 ± 8.1</td>
<td>0.00003</td>
</tr>
<tr>
<td>3 and 5</td>
<td>183</td>
<td>9.0 ± 7.8</td>
<td>0.030</td>
</tr>
<tr>
<td>5 and 4</td>
<td>20</td>
<td>7.5 ± 5.2</td>
<td>0.056</td>
</tr>
</tbody>
</table>

There were no statistically significant differences in the accuracy of the sonographic prediction of BW for GA groups 3 vs. 5, 2 vs. 3, 5 vs. 2, 2 vs. 1, 1 vs. 3 or 1 vs. 5.

CONCLUSIONS: Sonograms done between 36.0 and 38.9 weeks gestation allow for the most accurate prediction of BW. Though sonograms done after 38 weeks gestation to deliver a neonate of known GA are not accurate in predicting BW, this can be overcome by the GAP method. The precision of sonographic measurements later in gestation negatively affects the accuracy of the predicted BW and make sonograms performed at 39 weeks or later less useful in predicting BW.


OBJECTIVE: To determine whether the negative rate of the biophysical profile, characterize an eighteen-year variation in the false-negative rate, examine the relationship between the last normal profile score and death, and compare the false-negative rate of two perinatal populations.

METHODS: Retrospective review of cases from 1993-98.

RESULTS: There were 65 fetal deaths among 86,955 fetuses. Over an eighteen-year study period at one institution, the false-negative rate varied but not significantly. The cumulative false-negative rate was .748/1000 live births. The mean false-negative rate was .706/1000 at one medical center studied and 2.289/1000 at another disparate center. The average interval between last normal score and fetal death was 3.62 days and did not vary significantly between the medical centers.

CONCLUSIONS: False-negative fetal death reflects events that occur subsequent to the last normal test. Feto-maternal hemorrhage was the single most identifiable fetal etiology for false-negative death. The ratio of false-negative rate to perinatal mortality rate should be used as a more objective approach to reporting of this value, as false-negative rate likely reflects the underlying perinatal mortality.

OBJECTIVE: To compare the cost and benefits of prenatal diagnosis for Down syndrome (DS) between the British and the American approach.

STUDY DESIGN: An analytic approach was used for both strategies. The British strategy included screening by 1st trimester transvaginal ultrasound (U/S) at 10-14 weeks for nuchal translucency thickness (NTT) and offering CVS for those with abnormal NTT; 2) diagnosis in the 2nd trimester of all fetuses with abnormal NTT. For patients presenting for care in the 2nd trimester, the British strategy offered mid-trimester screening (maternal serum and fetal cell analysis) for DS; 3) 90% of those diagnosed with DS in the 2nd trimester had therapeutic abortion (T/A); and 4) only 60% of 1st trimester fetuses with DS and 70% of 2nd trimester fetuses with DS will be born alive.

RESULTS: The expected annual cost generated from using routine second-trimester ultrasound screening in the UK as compared to the current practice was $33.

CONCLUSIONS: Routine second-trimester ultrasound screening is associated with net benefits only if the ultrasound is performed in tertiary centers.

635 EFFICACIOUS SEALING OF FETOCUTIC ACCESS SITES WITH COLLAGEN PLUGS IN THE RABBIT MODEL. T Beazoglou, N* Yeildagiar, G Xu, Y Lam, WC Bui, Y Yasuda, N*, GC Xe, DEprest JA. Centre Surg. Technol. RUSL, Utah, UT, Belgium.

OBJECTIVE: To evaluate the efficacy of various uterine closure techniques in sealing the membrane defect following fetoscopy in the rabbit.

STUDY DESIGN: Following fetoscopy at 23 days gestation (GA, term=31 days) in pregnant rabbits, gestational sacs were assigned to different study groups. Group I: sacs were left unclosed; Group II: sacs were closed with commercially available extracommercial matrix (Matrigel®) plus a myometrial suture (n=23); Group III: plugging with collagen (Colgen®) plus a myometrial suture (n=22). At 30 days GA, membrane integrity, amniotic fluid presence and fetal body weight ratios (FWR) were assessed. The cure site was examined histologically.

RESULTS:

<table>
<thead>
<tr>
<th>Treatment Group</th>
<th>N</th>
<th>Amniotic Integrity</th>
<th>AF Presence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative controls</td>
<td>129</td>
<td>98% (95/97)</td>
<td>98% (95/97)</td>
</tr>
<tr>
<td>Group I: Positive Controls</td>
<td>24</td>
<td>41% (7/17)*</td>
<td>41% (7/17)*</td>
</tr>
<tr>
<td>Group II: Matrigel + suture</td>
<td>23</td>
<td>38% (7/18)</td>
<td>44% (8/18)*</td>
</tr>
<tr>
<td>Group III: Collagen + suture</td>
<td>22</td>
<td>82% (14/17)**</td>
<td>82% (14/17)**</td>
</tr>
</tbody>
</table>

*p<0.001 as compared to negative controls, **p = 0.05 as compared to positive controls.

Histology revealed cellular ingrowth over and into the collagen fibers. FWR was significantly lower (p<0.001) in fetuses from sacs with persistent membrane rupture (0.252±0.007) than in fetuses with treated sacs and restored membrane integrity (0.630±0.007).

CONCLUSIONS: These results provide preliminary evidence of the efficacy of collagen plugs to seal fetoscopic access sites and subsequently prevent oligohydramnios and pulmonary hypoplasia.

**OBJECTIVE:** To compare use of a specially-designed trocar for initial uterine entry with electrocautery in creation of a hysterotomy incision.

**STUDY DESIGN:** Ten patients underwent repair of fetal myelomeningocele through a fundal hysterotomy incision at 26-29 weeks gestation. In five patients, initial uterine entry was achieved with the aid of an electrocautery blade; in the other 5, initial uterine entry was accomplished by placement of a specially-designed trocar using a modified Seldinger technique.

**RESULTS:** Use of the Tulipan-Bruner trocar resulted in quicker uterine entry with less blood loss than standard entry with electrocautery.

**CONCLUSIONS:** The Tulipan-Bruner trocar represents an improvement in initial uterine entry when creating a hysterotomy incision.


**OBJECTIVE:** Traditionally prenatal diagnosis of single gene disorders (e.g. cystic fibrosis, thalassemia) has been achieved by DNA analysis using chorionic villus sampling (CVS). However, this procedure carries a risk of abortion of about 1%. The purpose of this study was to isolate fetal erythroblasts from the blood of pregnant women and to investigate whether the genetic mutations present in β-thalassemia could be detected by polymerase chain reaction (PCR) on single cells.

**STUDY DESIGN:** Couples heterozygous for the most common β-thalassemia mutations (β-codon 39, β' IVS 1-6, β' IVS 1-110, β IVS 2-745) in the region of Puglia, Italy, were recruited. All women underwent CVS in the first trimester of pregnancy. Before performing the invasive procedure 10ml of venous blood was collected from each patient. The blood samples were separated by a single density Percoll gradient following which the fetal erythroblasts were immuno-stained for zeta globin, isolated under a light microscope and analysed by PCR.

**RESULTS:** Of the six couples enrolled, fetal erythroblasts were detectable in four instances, in which the correct fetal gamma globin genotype was discerned by single cell PCR, as confirmed by the results obtained from CVS.

**CONCLUSION:** The non-invasive prenatal diagnosis of single gene disorders such as β-thalassemia by the isolation of fetal erythroblasts from maternal blood may be an alternative to CVS.

639 MATERNAL SERUM FERRITIN CONCENTRATION IN RELATION TO SMALL FOR GESTATIONAL AGE INFANTS. H Hao, S O’Brien, T. Tamura*, R Goldenberg. Dept of OB/GYN, Unv of Alabama at Birmingham, AL.

**OBJECTIVE:** To determine whether high maternal serum ferritin (Ft) concentrations are associated with small for gestational age (SGA) infants.

**STUDY DESIGN:** Serum Ft concentrations were measured twice at approximately 24 wks and 36 wks gestation in 497 multiparous women participating in a study of risk factors for SGA who delivered a singleton infant at 36 wks at our institution. Asymmetric (asy) SGA was defined by a ponderal index < 2.52.

**RESULTS:** Among 497 infants, 38 4(77%) were appropriate for gestational age (AGA), 61 (12%) were asy-SGA, and 52 (11%) were symmetric (sy) SGA. There were no differences in maternal hematocrit among these three groups. Overall, Ft concentration declined from 24 to 36 wks (mean 21.8±26.0 and 13.7±17.3 ng/ml, p=0.001). A higher Ft concentration was associated with black race, older maternal age, and smoking. Ft levels were higher in SGA than AGA mothers (28.4±32.4 vs 19.8±24.0, p=0.02) at 24 wks. Compared to sy-SGA mothers, asy-SGA mothers had a significantly higher mean Ft at both 24 wks (36.5±38.6 vs 20.0±21.5 ng/ml, p=0.01) and 36 wks (21.3±18.2 vs 7.9±9.2 ng/ml, p=0.001). The results were similar in both non-hypertensive (n=460) and hypertensive mothers (n=52). Ft ≥ 26 ng/ml (highest quartile at 24 wks) was significantly associated with asy-SGA. 48% of asy-SGA mothers had high Ft compared to 22% of AGA mothers, and 25% of sy-SGA mothers (p=0.01). Similar results were found at 36 wks. After adjusting for potential confounding factors such as maternal race, age, smoking, hypertension during pregnancy, and a prior history of SGA, the highest quartile of Ft at 24 and 36 wks was associated with an increased risk for asy-SGA [OR 3.6 (1.6-6.5) and [OR 2.4 (1.5-4.0)], respectively. No such association was found for sy-SGA.

**CONCLUSION:** High maternal serum Ft concentrations are associated with asymmetric but not symmetric SGA. High Ft, distinct from its relationship with hematocrit, is a biologic marker for asymmetric SGA regardless of whether hypertension is present.


**OBJECTIVE:** Tracheal occlusion until birth in a fetal lamb model with surgically induced congenital diaphragmatic hernia (CDH) causes excessive pulmonary growth and depletion of type II cells. This study was performed to test whether temporary tracheal occlusion of the hypoplastic lung leads to normal lung growth parameters.

**STUDY DESIGN:** A controlled surgical trial was performed in time-dated pregnant ewes with multiple pregnancy. 7 fetuses were subjected to creation of CDH at 75 days gestational age (GA; term = 145), tracheal clipping at 96 days, unclipping at 117 days and cesarean section at 140 days GA. Non-operated fetuses were used as normal controls. Pulmonary effects were assessed by lung-to-body weight ratio (LBWR) and morphometric measures such as mean terminal bronchial density (MTBD) and linear intercept (Lm). MTBD is a reflection of the number of terminal bronchioles per high power field, and inversely related to the number of alveoli per bronchiole. Linear intercept is an index of alveolar size.

**RESULTS:** In treated fetuses, the presence of CDH was confirmed at cesarean section. The non-invasive prenatal diagnosis of single gene disorders such as β-thalassemia by the isolation of fetal erythroblasts from maternal blood may be an alternative to CVS.

OBJECTIVE: In case of monochorionic (MC) twin pregnancy with one non-viable fetus compromising its co-twin, selective fetocide may be considered. We report on a simple, single port and ultrasound guided technique for cord occlusion using a readily available bipolar forceps, as an alternative to hysteroscopic cord ligation, embolisation of cord vessels or other techniques described.

STUDY DESIGN: Descriptive consecutive case series of the initial 10 cases from two referral units.

RESULTS: All gestations were MC and di-amnionic; 5 patients presented with a cardiac pregnancy, 5 with complicated twin-to-twin transfusion syndrome. Gestational age at intervention ranged from 18 to 24 weeks. Eight cases were performed under local anaesthesia. One patient underwent general anaesthesia, another was operated under spinal anaesthesia allowing an access technique by mini-laparotomy to place the port through the fundus. In two cases a 5 mm forceps was used, later on we used 3 mm (n=7) or 2.7 mm (n=1) instruments. In all cases the umbilical cord could be grasped, and coagulated successfully with power settings ranging from 20 to 50 Watts. In one case, the cord was occluded through the intert fertil membrane, because the target amnionic sac could not be accessed because of technical reasons. The intervention was done by ultrasound guidance and took no time to be about 15 minutes (range 5-30). The operators experienced the procedure as technically much easier than cord ligation. No complications occurred. One patient developed significant uterine activity postoperatively, but with mild uterine contractions within 10 days following the procedure; 2 patients asked for termination of pregnancy and one was still ongoing (the membranes of the normal twin still being intact). In the other cases, patients did not deliver prematurely and their babies are alive and well. (A video will be shown.)

CONCLUSION: Bipolar cord coagulation is a fast and effective single port procedure for selective fetocide in case of monochorionic twins. It does not require advanced hardware or endoscopic suturing skills. Although straightforward and performed through only one port, the risk for preterm prelabour rupture for the membranes remains high in this initial experience.


OBJECTIVE: To evaluate the degree of pulmonary hypoplasia following surgically induced oligohydramnios or congenital diaphragmatic hernia (CDH) in a mid-gestational rabbit model.

STUDY DESIGN: Rabbit pulmonary development mimics that of humans. A controlled surgical trial was performed in 37 time-dated does, operated on at 25 days gestational age (GA) which corresponds to the peak period of normal pulmonary development. The two undamaged gestational sacs were assigned to 1. Creation of amniotic-peritoneal shunt to induce chronic oligohydramnios (n=8), II. Creation of CDH (n=16), III. Sham operation (n=13). Other fetuses were used as controls. The second look operation was performed at 30 days GA (terms-92 days) to assess the effects on pulmonary growth, evaluated by wet lung-to-body weight ratio (LBWR) and morphometric parameters such as mean terminal bronchial density (MTBD) and linear intercept (Lm). MTBD is a reflection of the number of terminal bronchioles per high power field, and inversely related to the number of alveoli per bronchiole. Linear intercept is an index of alveolar size. Statistics were done with a multiple ANOVA, P=0.05 being significant (marked with *).

RESULTS: In both the oligohydramnios and CDH group, pulmonary hypoplasia was reflected by lower LBWR and higher MTBD. In the CDH group however, hypoplasia was more marked in the left lung, while the right side showed comparable pulmonary development as in normal fetuses. The linear intercept of treatment groups did not differ from controls, since alveolisation in the rabbit occurs only around and after birth.

LWBR  MTBD left  MTBD right  Lm left  Lm right
Normal fetuses   0.80±0.004  0.917±0.188  0.83±0.178  0.102±0.010  0.107±0.010
I. Oligoamnios   0.627±0.044  1.360±0.380  1.390±0.080  0.101±0.009  0.096±0.005
II. CDH         0.014±0.004  1.786±0.408  0.991±0.211  0.098±0.012  0.101±0.010
III. Sham       0.025±0.006  1.056±0.353  0.839±0.157  0.101±0.015  0.097±0.007

CONCLUSION: This study confirms that the rabbit can be used to induce pulmonary hypoplasia. Although both oligohydramnios and creation of CDH are frequently used to study experimental pulmonary hypoplasia, the consequences of both interventions on individual lung growth are not the same. Creation of CDH causes a more extreme pulmonary hypoplasia, particularly on the left side. This must be taken into account when studying pulmonary hypoplasia or its correction in utero.


OBJECTIVE: Embryo-fetoscopy is currently being revived, and most experiments are done with large animal models such as the pregnant sheep. For training and research purposes we wanted to develop a small and readily available animal model for fetoscopy.

STUDY DESIGN: In 12 time-dated pregnant rabbits at 22 days gestational age (GA), two amniotic sacs (n=24), one in each uterine horn, were used for a fetoscopic procedure. After laparotomy, a 2 to 3 mm microsurgical myometrial incision was made to expose the chorionic and amnionic membrane. Under microsurgical control, a 2 mm needle was inserted into the amnionic sac. Through this needle, a 1.2 mm 10,000 pixels endoscope was inserted to carry out fetoscopy during maximally 10 minutes, using 5 - 10 mL saline amnio-infusion. The untreated amnionic sacs served as negative controls. Mean outcome measurements were able to visualize the placenta, umbilical cord and the different fetal parts during fetoscopic exploration, as well as fetal survival and weight at second look operation at 30 days (test). Ultrasound and X-rays were used.

RESULTS: In all cases, fetoscopy could be carried out successfully. In the fetoscopic group, 100% of fetuses survived till delivery, while 85.7% in controls (not significant - NS). Mean weight of alive fetuses was 36.5 ± 3.27 g in the fetoscopy group while 33.2 ± 1.48 g in controls (NS). (A videotape will be shown.)

CONCLUSION: The mid-gestational rabbit can be used to perform fetoscopy.


STUDY DESIGN: We designed a multicenter retrospective study and considered for the analysis only pregnancies with IUGR neonates. A common protocol for maternal, fetal and neonatal data collection was adopted among neonatal centers involved in the study. IUGR was defined as a birthweight below the 10th centile for the Italian population. From 26 centers, 1319 IUGR neonates were recruited. Median gestational age at delivery was 38 weeks (range 25-42). Prenatal variables considered in the study were: multiple pregnancy, maternal infections, preeclampsia, perinatal diagnosis of IUGR and mode of delivery. For prenatal diagnosis of IUGR a fetal abdominal circumference (AC) below the 10th centile at 28-32 weeks, or a decrease of the AC of at least 10% in a subsequent ultrasound scan 8 weeks apart (24-28 to 32-36 weeks), was required. Severe neonatal morbidity was defined as the occurrence of at least one of the following: sepsis, pneumonia, 3rd or 4th grade respiratory distress syndrome, broncho pulmonary dysplasia, intraventricular hemorrhage, retinopathy or necrotizing enterocolitis. Mild neonatal morbidity was defined on the basis of at least one of the following: neonatal asphyxia, hypoglycemia, hypocalcemia, shake, or 1st or 2nd grade respiratory distress. Multiple logistic regression was used for univariate analysis.

RESULTS: Among the 1319 neonates, IUGR was discovered after birth in 817 (61.9%) cases; cesarean section was performed in 602 (46.6%) cases. Perinatal death occurred in 43 (3.3%) cases; severe morbidity in 87 (6.6%) cases; mild morbidity in 130 (9.9%) cases. Preeclampsia was present in 183 (34.1%) of the 418 neonates born before 37 weeks and in 50% of those born between 25 and 29 weeks and 41.5% of those born between 30 and 35 weeks. Among all prenatal variables, logistic regression showed that perinatal mortality was associated with maternal preeclampsia (p<0.05), while severe and mild morbidity were associated to preeclampsia and antenatal ultrasound evidence of IUGR (p<0.01).

CONCLUSIONS: Preeclampsia is the most important risk factor for perinatal mortality and morbidity in pregnancies complicated by IUGR. The antenatal evidence of IUGR further identifies a group of fetuses at high risk for neonatal morbidity.

OBJECTIVE: To determine the differences in placental characteristics of appropriate for gestational age (AGA) and symmetric and asymmetric small for gestational age (SGA) infants. (SGA, SAGA).

STUDY DESIGN: Detailed gross placenta examinations were done as part of an NIH sponsored study of SGA newborns. Pregnant women with risk factors for SGA and a random sample from the overall population were prospectively recruited. Placental length, width, thickness (TK) and cord length (CL) were measured. Placentas were trimmed, weighed and a qualitative assessment of the presence or absence of infarcts was made by a single pathologist. Length and width were averaged to obtain the diameter (D).

RESULTS: Of the 1211 infants, 1041 (85%) were AGA, 101 (8.3%) SAGA and 69 (5.7%) SGA. Placenta of the SGA infants were significantly smaller in D, W and TK than those of AGA infants. Placental D and W were not different between SSGA and SAGA. CL was shorter in SSGA and placentas were thinner in SAGA. Gross infarcts were present in 20% of placentas from SGA infants vs 12.9% of placentas from AGA infants. Further analysis showed that gross infarction was increased in placentas of preterm AGA infants vs preterm SGA infants (36.4% vs 9.4%, p<0.002) but not in placentas of term AGA, SAGA, and SGA infants (16.7%, 12.3% respectively).

CONCLUSIONS: Placenta associated with SGA infants were smaller, thicker, and with increased infarctions in those delivering preterm. Placentas associated with SAGA were smaller with shorter cords but were not thin or infarcted. These differences likely reflect the various factors that impact placental and fetal growth leading to symmetric or asymmetric SGA.

646 ACCURACY OF SONOGRAPHIC ESTIMATED FETAL WEIGHT WITH AND WITHOUT OLIGOHYDRAMNIONS: A CASE-CONTROL STUDY. Chauhan SP, Scardo JA, Magann EP, Hendrix NW, Morrison JCA, Spartanburg Regional Medical Center, Spartanburg, SC, University of Mississippi, MS.

OBJECTIVE: The null hypothesis is that the accuracy of sonographic estimated fetal weight (SEFW) is similar among those with and without oligohydramnios, defined as amniotic fluid index (AFI) < 5.0 cm.

STUDY DESIGN: If 50% of SEFW are within 10% of actual birth weight (BW), 500 parturients are necessary to demonstrate a 15% difference in the accuracy of SEFW. In the study, 2307 patients with reliable GA, OLIGO and sonographic measurements of estimated fetal weight (SEFW) were compared to actual birth weight (BW), 300 parturients are necessary to demonstrate a 15% difference in the accuracy of SEFW.

RESULTS: Of the 1211 infants, 1041 (85%) were AGA, 101 (8.3%) A-SGA, 69 (5.7%) SGA. Placenta of the SGA infants were significantly smaller in D, W and TK than those of AGA infants. Placental D and W were not different between SSGA and SAGA. CL was shorter in SSGA and placentas were thinner in SAGA. Gross infarcts were present in 20% of placentas from SGA infants vs 12.9% of placentas from AGA infants.

CONCLUSIONS: The accuracy of SEFW is not influenced by whether the patient has OLIGO or not. More importantly, the accuracy of identifying IUGR is not diminished among those with AFI ≤ 5.0 cm.
650 MOLECULAR AND FETAL TISSUE BIOPSY CAPABILITIES ARE NEEDED TO MAXIMIZE PRENATAL DIAGNOSIS OF FUNCTIONAL EPIDERMOLYSIS BULLOSA (JEB): FETAL SKIN BIOPSY USING A 2MM MICROENDOSCOPE. D.E. Seuberlich, B. Feldman, E.L. Krivchenia, M.I. Evans, J. Barki, M.P. Johnson. Division of Reproductive Genetics, Department of Ob/Gyn, Wayne State University/Hutzel Hospital, Detroit, MI, and Storz Corp, Geneva, Switzerland.

OBJECTIVES: To develop a new method for directly visualizing fetal skin biopsy which would have a lower complication rate than previously employed ultrasound or fetoscopic methods.

STUDY DESIGN: A patient at risk for JEB first underwent amniocentesis for optimal pt care.

RESULTS: The range of gestational ages sampled was 32-40 weeks. An LBC of 25,000 demonstrated a specificity and positive predictive value for mature LS of 92% and 99% respectively. When analyzed vs PG concentration >2%, specificity and positive predictive value of 71% and 87% respectively were demonstrated.

CONCLUSIONS: Our results suggest that LBC analysis is a rapid, inexpensive, readily available, and reliable method to assess fetal lung maturity. In our population, limiting LS and PG analysis to samples with 10,000 < LBC and < 25,000 would eliminate performing 82% of the LS and PG assays. This strategy is likely to enhance clinical care (improved availability and more rapid turn-around time) while reducing costs.

651 ELEVATED MATERNAL SERUM ALPHA FETOPROTEIN AND FETAL GROWTH PATTERNS IN THE THIRD TRIMESTER. C. Ingardia, R Conley, J. Steinfield, J. Wax. Division of Maternal Fetal Medicine, Hartford Hospital, Hartford, CT.

OBJECTIVE: To assess sonographic fetal growth parameters in gravidas with elevated maternal serum alpha fetoprotein (MSAFP) to evaluate the relationship between degree of elevation and pattern of fetal growth.

STUDY DESIGN: 84 gravidas seen in our division for unexplained elevated (≥ 2.0 MoM) midtrimester MSAFP performed at a single laboratory from 1/1/93 to 6/1/98 were evaluated. Exclusion criteria included maternal diabetes mellitus, chronic hypertension, antiphospholipid syndrome and a previous fetus with intrauterine growth restriction. Only those gravidas that had 2 or more ultrasounds at ≥ 28 weeks were included. Fetal growth percentiles (%tiles) for fetal weight (FW) abdominal circumference (AC), head circumference (HC) and femur length (FL) were calculated based on the last ultrasound performed at ≥ 35 weeks, and suboptimal growth categories were subdivided (<5th%tile, <10th%tile, <15th%tile). Receiver operator characteristic (ROC) curves were generated to determine an optimal cut-point.

RESULTS: Under IV sedation, aseptic conditions, and continuous ultrasound guidance, the Storz 2 mm endoscope was successfully employed. PG determinations. Receiver operator characteristic (ROC) curves were generated to determine an optimal cut-point.
January 1999

In a study to evaluate the potential of a single ion criteria to predict fetal growth and weight, 28 fetuses were evaluated at 28 weeks gestation. The values were subdivided into two groups: (1) HC and (2) LP. The results were analyzed by the Student's t-test and were also evaluated by the optimal AC index of the fetal weight. The differences were statistically significant (p < 0.05) and the correlation coefficients were also significant (p = 0.02).
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