

278 MATERNAL-FETAL HLA RELATIONSHIPS AT DRB LOCI IN PREECLAMPSIA HILARY S. GAMMILL¹, TESSA M. AYDELOTTE², J. LEE NELSON¹, ¹University of Washington, Seattle, Washington, ²Fred Hutchinson Cancer Research Center, Clinical Research, Seattle, Washington

OBJECTIVE: Normal pregnancy depends on maternal tolerance of the semi-allogeneic fetus. Preeclampsia (PE) may reflect impaired maternal tolerance of the fetus. We sought to investigate whether maternal-fetal HLA relationships at Class II DRB loci are altered in PE. In addition to the DRB1 locus, we aimed to evaluate the supertypic DRB loci DRB3, DRB4, and DRB5, which represent evolutionary HLA lineages.

STUDY DESIGN: Women meeting ACOG/NHLBI criteria for PE were recruited at diagnosis. Maternal peripheral and cord blood was collected. DNA was extracted by standard techniques. HLA genotyping was performed using a polymerase chain reaction/sequence-specific oligonucleotide probe technique for DRB1. Genotype for the DRB loci, DRB3, DRB4, or DRB5 was inferred based on known tight linkage disequilibrium with DRB1.

RESULTS: Maternal-fetal relationships at the DRB1 locus and at the DRB3, DRB4, and DRB5 loci were classified as incompatible, bidirectionally compatible, or unidirectionally compatible from the maternal or fetal perspective. There was no difference in the distribution of classifications between patients with PE (n=33) and controls (n=365) (overall compatibility at DRB1 35.5% and 34.4%, and at DRB345 78.1% and 81.6%, respectively). Analyses of homozygosity at DRB1 and DRB345 showed a trend toward decreased homozygosity at DRB345 in PE (15.2% vs 25.8% in controls, p=0.17). Supertypic genotypic classification suggested a trend toward increased prevalence of haplotypes that lack an HLA Class II supertype, i.e. homozygous or heterozygous null (39.4% in preeclampsia vs 29.1% in controls, p=0.32).

CONCLUSION: Preliminary results do not suggest excessive maternal-fetal HLA sharing at DRB loci in PE. However, haplotype analysis according to DRB3, DRB4, DRB5, or null supertypic groups suggests a potential role that merits further investigation.

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279 FIRST TRIMESTER 3D POWER DOPPLER OF THE INTERVILLOUS SPACE IN PATIENTS WITH DECREASED PAPP-A LEVELS AND INCREASED UTERINE ARTERY PULSATILITY INDEX JULIANA GEBB¹, FRANCINE EINSTEIN², IRWIN R. MERKATZ¹, PEER DARI¹, ¹Montefiore Medical Center/Albert Einstein College of Medicine, Obstetrics & Gynecology and Women's Health, New York, New York, ²Montefiore Medical Center/Albert Einstein College of Medicine/, Obstetrics & Gynecology and Women's Health, New York, New York

OBJECTIVE: Decreased PAPP-A levels and increased uterine artery pulsatility index (UAPI) in the first trimester have been correlated with preeclampsia (PEC) risk and have been hypothesized to be markers of abnormal placentation. Using 3D power Doppler (3DPD) as an estimate of intervillous blood vessel density and corpuscle volume, we sought to compare 3DPD intervillous parameters in women with 1) low vs. normal maternal serum PAPP-A levels and 2) elevated vs. normal UAPI.

STUDY DESIGN: We conducted a prospective observational study of singleton pregnancies presenting for first trimester screening. 3DPD spherical volumes were analyzed using the VOCAL™ program to determine the Vascularization Index (VI), Flow Index (FI) and Vascularization Flow Index (VFI). UAPI and PAPP-A levels were measured. The 10th percentile of PAPP-A was determined and considered low. The 90th percentile of UAPI was determined and considered elevated. 3DPD indices were then compared between groups using the student's t-test. P<0.05 was considered statistically significant.

RESULTS: 275 patients enrolled. The 10th percentile for PAPP-A was 0.6 MoM while the 90th percentile for UAPI was 2.8. 28/275 patients had low PAPP-A levels. Decreased VFI was identified in these patients (9.7±4.3 vs.12.7±8.0). Although these patients also had lower VI and FI (VI 19.3±8.4 vs.23.3±12.5, FI 50.0±6.5 vs.52.1±8.7), the differences were not statistically significant. UAPI measurements were adequately performed in 265/275 patients. 26/265 patients had UAPI>2.8. All 3DPD parameters were similar in those with elevated vs. normal UAPI.

CONCLUSION: Patients with low first trimester PAPP-A levels had reduced VFI supporting the hypothesis that low PAPP-A is associated with abnormal placentation. 3DPD parameters were not significantly different in women with increased first trimester UAPI suggesting that the uterine artery changes of PEC may not be directly related to abnormal placentation.

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280 THE DOPPLER TRANSITIONAL PHASE IN SEVERELY PREMATURE IUGR FETUSES JASON PICCONI¹, KATHRYN DRENNAN², FARHAN HANIF², GIANCARLO MARI³, ¹Wayne State University / Detroit Medical Center, Obstetrics and Gynecology, Detroit, Michigan, ²Wayne State University / Detroit Medical Center, Detroit, Michigan, ³University of Tennessee Health Science Center, Obstetrics and Gynecology, Memphis, Tennessee

OBJECTIVE: We recently demonstrated Doppler changes in the Ductus Venosus (DV) progress through an intermittent transitional phase before absent/reversed flow is persistent that can last from 1 to 57 days. The hypothesis for this work is that this phenomenon is not specific to the DV, but is a systemic pattern in worsening IUGR

STUDY DESIGN: Multivessel serial Doppler studies were prospectively performed in 15 IUGR fetuses (EFW < 10th percentile and umbilical artery pulsatility index > 95th percentile) from diagnosis until demise or delivery. At least 3 studies were performed in each fetus, each consisting of 3 different sets of waveforms for a total of at least 100 waveforms for each vessel. MCA Doppler waveforms assessed pulsatility index and peak systolic velocity, while umbilical artery, umbilical vein, and DV Doppler waveforms qualitatively assessed forward, absent, or reversed flow in diastole for UA and DV, and presence or absence of pulsation in the UV. A transitional phase for each vessel was defined when normal and abnormal flow patterns were identified during the same exam for that vessel.

RESULTS: 91 Doppler studies were performed (range: 3-15; Median: 5). Gestational age at entrance in the study was 22.2 to 30.2 weeks (Median: 25.4) and at delivery was 23.6 to 32.0 weeks (Median: 27.2). Birth weights were 396 to 1200 grams (Median: 550). There were 5 neonatal deaths, 7 neonates survived, and 3 fetal demises due to gestational age < 25 weeks or the parents declined intervention.

	Days of Respective Doppler Findings before Delivery or Fetal Demise											
	UA			MCA PI		MCA PSV		UV		DV		
	Intermittent	Absent	Reversed	Intermittent	Elevated PI	Intermittent	Elevated PSV	Intermittent	Pulsatile	Intermittent	Absent	Reversed
Mean	12	7	3	12	6	9	3	14	7	12	2	2
Median	9	6	2	12	6	7	1	13	7	9	2	1
Range	2-23	1-12	0-7	3-22	2-13	3-22	0-10	1-38	1-12	4-23	0-4	1-6

CONCLUSION: This data indicates the transitional phase previously identified in the DV is demonstrated throughout the fetal vascular tree in severely premature IUGR fetuses and emphasizes the importance of revisiting the way Doppler ultrasound is performed in the fetus.

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281 UMBILICAL VEIN PULSATILE FLOW CAUSED BY INCREASED RESISTANCE IN THE PORTAL CIRCULATION KATHRYN DRENNAN¹, JASON PICCONI², FARHAN HANIF¹, MARI GIANCARLO³, ¹Wayne State University, Obstetrics and Gynecology, Detroit, Michigan, ²Wayne State University, Obstetrics and Gynecology, Detroit, Michigan, ³University of Tennessee Health Science Center, Obstetrics and Gynecology, Memphis, Tennessee

OBJECTIVE: Pulsatile flow in the umbilical vein (UV) has been attributed to abnormal flow in the ductus venosus (DV). The aim of this study is to examine the mechanisms of pulsatile flow in the UV by investigating the correlation with changes in the hepatic portal circulation and in the DV.

STUDY DESIGN: This is a cohort study consisting of 21 patients with IUGR (EFW <10% and UA PI >95%) followed with serial Doppler ultrasound evaluations, for a total of 85 measurements. The waveforms were analyzed qualitatively. The a-wave of the DV was described as either having reversed or forward flow. The UV was categorized as having normal, monophasic pulsatile, biphasic pulsatile, or reversed flow. The portal sinus (PS) waveforms were categorized as forward flow, increased resistance, or reversal of flow. The data was analyzed by SPSS using Spearman's rank correlation coefficient and the chi-squared test.

RESULTS: This study shows that pulsatile flow in the UV is correlated with changes in the PS (R²=0.682 p<0.001). When the DV has forward flow, the correlation between pulsatile or reversed flow in the PS and pulsatile flow in the UV persists (R²=0.612; p<0.001). However, as the DV becomes abnormal, the correlation between PS and UV waveforms becomes non-significant (R²=0.577, p=0.453). All cases with normal UV vein waveforms (33) show normal PS waveforms. Of the 36 cases with monophasic pulsations, 32 had normal DV waveforms, 17 showed increased resistance in the PS, and 18 cases showed reversal at the level of the PS (p<0.001). In all cases (11) with reversal of flow or biphasic pulsations in the UV, either the DV (1), PS (2), or both (8) shows reversal of flow.

CONCLUSION: We found that initially in IUGR fetuses increased resistance in the hepatic portal circulation causes pulsatile flow in the UV. As myocardial dysfunction occurs, a-wave reversal in the DV contributes to pulsatile flow in the UV. This is the first study that demonstrates an increased liver resistance in IUGR fetuses and explains that there is a temporal sequence of vascular changes at the PS and at the DV.

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