CLINICAL OBSTETRICS, DIABETES, LABOR, MEDICAL-SURGICAL-DISEASE, PHYSIOLOGY/ENDOCRINOLOGY, PREMATURITY

Abstracts 237 – 386

237 Type-2 diabetes mellitus: does prenatal care affect outcomes?

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OBJECTIVE: To determine if prenatal care affects adverse perinatal outcomes in pregnant women with Type-2 Diabetes Mellitus.

STUDY DESIGN: This was a retrospective cohort study of women with diabetes mellitus who carried pregnancies to term in the state of California between 1997 and 2006, using vital statistics data linked to birth certificates. Women were stratified by time of presentation to care and we compared those who presented in the first trimester to those who presented in the 9th month of gestation. Perinatal outcomes looked at included: preeclampsia, macrosomia, preterm delivery, cesarean delivery and intrauterine fetal demise (IUFD). The two groups were compared with chi-squared testing to determine statistically significance.

RESULTS: In those women with T2DM who did not present to prenatal care until their 9th month of gestation, there was an increased rate of IUFD. Women who presented in the 9th trimester had a 16% risk of IUFD compared to 1% in those who presented in the 1st trimester. There was also an increased rate of preterm birth in the late presentation cohort (29.44% in the 9th month vs 21.02% in the 1st trimester). There was no difference in rates of macrosomia or preeclampsia between the two cohorts (Table).

CONCLUSION: Identification of T2DM and earlier presentation to prenatal care is associated with improved maternal and fetal outcomes.

Outcomes in Pregnancies Complicated by T2DM Based on Time of Presentation to Prenatal Care

Outcomes	1st Trimester	No Prenatal Care	P-value
IUFD	0.93%	11.27%	<0.0001
Preterm Delivery	21.02%	29.44%	0.004
Preeclampsia	10.89%	15.64%	0.012
Macrosomia	18.24%	19.27%	0.66
Cesarean Delivery	53.65%	48.36%	0.08

238 BMI and gestational diabetes

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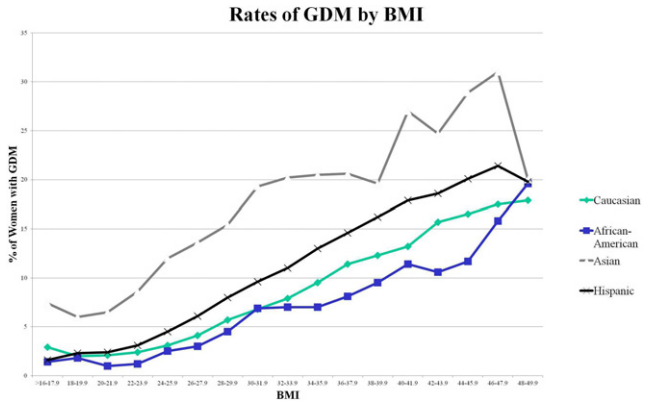
OBJECTIVE: To examine the utility of body mass index as a screening tool for gestational diabetes across ethic subgroups.

STUDY DESIGN: This is a retrospective cohort study of all pregnant women with recorded body mass index (BMI) and gestational diabetes (GDM) status in the California Birth Registry of 2006. Rates of GDM were stratified by increasing BMI in the underweight to severely obese ranges. These results were then further stratified by self-described race for Caucasian, African-American, Hispanic and Asian women. Chi squared tests and multivariable logistic regression analyses were used for statistical analysis.

RESULTS: We found that rates of GDM increased consistently with increasing BMI. Within the non-obese range (BMI <30) Caucasian, African-American and Hispanic women had comparable rates of GDM, and all were less than 10%. For each incremental increase in BMI, Asian women experienced a greater rate of GDM than their non-Asian counterparts. In the non-obese range, rates of GDM in Asian women were as high as 15.4% (BMI 28-29.9). However, even at a BMI of greater than 50, the incidence of GDM was still less than 30%.

CONCLUSION: Increasing BMI is associated with GDM. However, this association varies by race/ethnicity and even in the super obesity ranges (BMI>50), there are still a majority of women who do not have GDM.



239 Prediction of gestational diabetes mellitus in the first trimester; comparion of fasting plasma glucose, two-step and one-step methods

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OBJECTIVE: Our aim was to determine the best approach in diagnosing gestational diabetes mellitus in the first trimester.

STUDY DESIGN: At the first prenatal visit 736 women between 11-14 weeks underwent fasting blood glucose testing. 486 out of 736 singleton pregnant women who consented to participate were recruited in this randomized prospective study. Women with concomitant diseases, pregestational diabetes or fasting glucose levels >125 mg/dl were excluded. Patients were randomly assigned to two groups; two-step 50-g and a 75-gr glucose challenge test (GCT). In two-step group if the test results exceeded the predefined threshold value (140 mg/dl), the 100-g oral glucose tolerance test (GTT) was performed. In the event of a normal result subsequent testing were performed at 24-28 weeks. Sensitivity, specificity, positive predictive value, negative predictive value, prevalence, positive likelihood ratio and negative likelihood ratios were determined for each group (Table).

RESULTS: Among the 486 women studied, 53 women (10.9%) were diagnosed as GDM by American Diabetes Association (ADA) criteria. The fasting plasma glucose (FPG), two step 50gr GCT and 75gr GTT methods identified GDM in 25/486(5.1%), 15/248(6.0%) and 27/238(11.3%) women respectively. Area under ROC curve of FPG testing was 0.623 (95% CI, 0.538-0.707), 50gr two step GCT was 0.708 (95% CI, 0.617-0.798) and 75 gr GTT was 0.792 (95% CI, 0.709-0.876) respectively.

CONCLUSION: Fasting plasma glucose levels recommended by The International Association of Diabetes and Pregnancy Study Groups (IADPSG) has a very high false positive rate, making it an inappropriate test for diagnosing GDM. The 75 gr GTT is the preferable test with the highest sensitivity, specificity, positive and negative predicitive values for diagnosing GDM in the first trimester.

Diagnostic performance of FPG, 50 gr GCT and 75gr GTT in the first trimester

	Fasting Plasma Glucose	50gr two-step OGCT	75gr GTT
Sensitivity	47.17	68.18	87.1
Specificity	77.37	100	100
Positive Likelihood Ratio	2.08	Infinity	Infinity
Negative Likelihood Ratio	0.68	0.32	0.13
Positive predictive value	20.33	100	100
Negative predictive value	92.29	97	98.1
Prevalence	10.91	8.87	13.03

240 Ultrasound prediction of birthweight in diabetic pregnancies: 3D volumes vs 2D biometry?

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OBJECTIVE: Risk of macrosomia and shoulder dystocia in diabetic pregnancies place a premium on prediction of birthweight (BW) in late pregnancy. 2D ultrasound has historically performed poorly. We aimed to estimate if 3D humeral and femoral volumes were superior to, or could improve upon the 2D estimated fetal weight (EFW) prediction of BW.

STUDY DESIGN: We performed a 2-year prospective cohort study of consecutive pregnancies complicated by gestational (GDM) and pregestational Type II diabetes (DM-II). Between 33-37 weeks, they underwent 2D ultrasound for estimated weight (EFW) by biometry, as well 3D volumes of the humerus and femur. BW and detailed clinical history was collected. Macrosomia was defined by absolute weight, using ≥ 4000g and ≥ 4500g, as well as BW percentile, using ≥ 90th and ≥ 95th %iles. 2D EFW and 3D volumes were considered both continuously as percentiles using published nomograms, and dichotomously. Multivariable regression was used to adjust for diabetes type and time in weeks between ultrasound and delivery. Receiver operator characteristic curves were used to estimate the predictive ability of the models, and were compared with the c-statistic.

RESULTS: Of 176 women, 27 (15.3%) delivered an infant ≥ 4000g, 36 (20.5%) ≥ 90th%ile, and 26 (14.8%) ≥ 95%ile. 2D EFW was most predictive of BW ≥ 95%ile (AUC 0.82), followed by humerus volume (AUC 0.80), and then femur volume (AUC 0.67). The addition of 3D volumes to the 2D predictive model did not improve upon its ability to predict BW.

CONCLUSION: While humoral and femoral volumes are easily obtained during 2D ultrasounds for growth, they do not improve prediction of macrosomia in diabetic pregnancies; 2D biometry alone remains the most predictive tool for BW in diabetic pregnancies.

	2D EFW (Base model)	Including 3D Femur volume %ile		Including 3D Humerus volume %ile		Including 3D Femur & Humerus volumes	
	AUC	AUC	p	AUC	p	AUC	p
BW ≥ 4000g	0.83	0.83	0.81	0.85	0.12	0.86	0.13
BW ≥ 4500g	0.86	0.85	0.64	0.86	0.83	0.85	0.90
BW ≥ 90th %ile	0.81	0.81	0.78	0.82	0.61	0.82	0.56
BW ≥ 95th %ile	0.82	0.82	0.71	0.85	0.18	0.86	0.09

**P* values compare AUC for specified model to base model AUC.

241 Prospective evaluation of glycemic markers to predict morbidity in diabetic pregnancies

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OBJECTIVE: Fructosamine remains unutilized in clinical obstetrics, though it is considered superior to hemoglobin A1c in non-pregnant settings complicated by anemia, as a marker of chronic glycemic control. We aimed to compare fructosamine, hemoglobin A1c, and fasting glucose in their association with neonatal morbidity and macrosomia.

STUDY DESIGN: We performed a prospective cohort study of women with gestational (GDM) and Type-II diabetes (DM-II), singletons, and no known anomalies. Daily fasting serum glucose, hemoglobin (Hgb) A1c and fructosamine each trimester, as well as measures at delivery were recorded. Detailed medical and pregnancy history were recorded. Primary outcome was composite neonatal morbidity, defined as one or more of: respiratory distress syndrome (RDS), hyperbilirubinemia (HB), perinatal death, shoulder dystocia, hypoglycemia requiring treatment. Secondary outcomes included macrosomia (>4000g), and the individual components of the composite. Generalized estimating equations (GEE) were used to estimate the risk of composite morbidity, accounting for repeated measures and adjusting for confounders. Analyses were repeated stratified by DM-II vs GDM.

RESULTS: 301 women met eligibility; 97 with GDM and 204 with DM II. There was a high incidence of the composite morbidity (n=147, 48.1%) as well as macrosomia (n=49, 16.3%); but composite morbidity occurred less frequently in women with GDM v. DM-II (42.3% v. 51.9%, p=0.01). Elevated fructosamine, even >210, was not significantly associated with an increased risk of morbidity (aOR 1.55, 95%CI 0.84 - 2.86) or macrosomia (aOR 2.14, 95%CI 0.95 - 4.80); elevated mean fasting values also showed no significant association. However, elevated Hgb A1c >8.0 was significantly associated with morbidity and macrosomia.

CONCLUSION: Fructosamine was not found to be a useful tool to predict neonatal morbidity in pregnancies complicated by GDM and DM-II. However, HgbA1c was associated with adverse birth outcomes and should be used clinically for counseling.

	Composite Morbidity		Macrosomia	
	aOR (95% CI)	p	aOR (95% CI)	p
HgbA1c				
≤ 6.0	Ref.		Ref.	
6.1 - 6.8	1.33 (0.87 - 2.05)	0.19	2.07 (1.06 - 4.03)	0.03
6.8 - 8.0	1.15 (0.59 - 2.21)	0.68	7.09 (2.95 - 17.03)	<0.01
>8.0	3.01 (1.17 - 7.75)	0.02	4.17 (1.36 - 12.79)	0.01
Fructosamine				
≤ 186	Ref.		Ref.	
186.1 - 210	1.32 (0.92 - 1.87)	0.13	1.41 (0.90 - 2.21)	0.13
>210	1.55 (0.84 - 2.86)	0.16	2.14 (0.95 - 4.80)	0.01
Mean Fasting Glucose				
≤ 95	Ref.		Ref.	
95.1 - 105	1.14 (0.77 - 1.70)	0.51	1.43 (0.86 - 2.37)	0.16
≥ 105	1.08 (0.48 - 2.45)	0.85	1.37 (0.48 - 3.87)	0.55