ANTEPARTUM FETAL ASSESSMENT, DOPPLER ASSESSMENT, EPIDEMIOLOGY, GENETICS, NEONATOLOGY

Abstracts 62 – 70

Moderators: Jim Goldberg, MD; Mary Norton, MD

62 Risk of stillbirth according to second trimester aneuploidy screen result in the Stillbirth Collaborative Research Network: a population-based study

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OBJECTIVE: To explore the association between positive 2nd trimester aneuploidy screen and stillbirth (SB) using a population-based approach, and after accounting for various risk factors known prior to pregnancy.

STUDY DESIGN: Prospective, multicenter, population-based case-control study of all SB (fetal deaths >20 weeks) and a representative sample of live births (LB) enrolled at delivery in 5 geographic areas at 59 hospitals averaging >80,000 deliveries/year. SB and LB underwent an extensive standardized evaluation protocol (interview, record abstraction, placental pathology, biospecimens, and postmortem exam for SB). For this analysis, only SB and LB delivered after 24 weeks with available results of serum screening were included. Univariate analysis was first performed to determine the association between each analyte and SB. The association was then tested using various multivariable models to take into account pre-pregnancy factors. Analyses were weighted to account for oversampling in the design.

RESULTS: Of the women enrolled in the overall study, 157 of 399 (39%) with SB and 626 of 1756 (36%) with LB who delivered after 24 weeks had 2nd trimester serum screening. On univariate analysis, MSAFP >2.0 MoM (OR 2.8, 95%CI 1.4-5.3), hCG >2.0 MoM (OR 2.1, 95% CI 1.2-3.7), and inhibin A >2.0 MoM (OR 6.9, 95% CI 3.4-14.0) increased the odds of SB. uE3 was not significant. When adjusted for pre-pregnancy factors and one another, only inhibin A >2.0 MoM remained associated with SB (adjOR 5.0, 95% CI 2.0-12.6, p=0.0008). This result remained significant (p=0.0026) when intrapartum SB, multiple gestations, and anomalous fetuses were excluded. We also examined multivariate models that additionally incorporated early pregnancy risk factors, and inhibin A remained significant. Further details will be presented.

CONCLUSIONS: After controlling for risk factors that are known prior to pregnancy, inhibin A remains the only 2nd trimester analyte associated with stillbirth. This association is strong and may prove to be useful in risk assessment.

63 Fetal pulmonary arterial vascular impedance reflects changes in fetal oxygenation in primate model at near term gestation

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OBJECTIVE: We hypothesize that fetal hemodynamics can be utilized for assessment of fetal oxygenation in near term gestation.

STUDY DESIGN: 20 rhesus macaques underwent Doppler ultrasonography at 150-157 gestational days (term 165 days). Fetal right (RVCO) and left (LVCO) ventricular cardiac outputs were calculated. Right pulmonary artery (RPA), ductus arteriosus (DA), ductus venosus (DV), and umbilical artery (UA) blood velocity waveforms were obtained at baseline, during maternal hypoxemia (12% oxygen), and maternal hyperoxygenation (100% oxygen), and their pulsatility index (PI) values were calculated. One-way ANOVA of repeated measures was used for statistical analysis.

RESULTS: Table 1.

CONCLUSIONS: A decrease in fetal oxygenation leads to an increase in fetal pulmonary arterial vascular impedance. Increased fetal oxygenation has the opposite effect on fetal pulmonary arterial vascular impedance. The changes in fetal oxygenation did not affect UA and DV blood velocity waveforms. Fetal pulmonary arterial vascular impedance reflects changes in fetal oxygenation status at near term gestation.

Table 1.

Variable	Baseline mean (SD)	Hypoxemia mean (SD)	100% O_2 mean (SD)
RVCO (ml/min)	149.1 (37.4)	145.5 (30.1)	137.1 (30.4)
LVCO (ml/min)	93.9 (21.7)	87.4 (20.6)	82.8 (22.8)
RPA PI	30.3 (20.6)	166.4 (133.8)*	6.9 (4.1)*
DA PI	2.4 (0.3)	2.3 (0.2)	2.8 (0.5)*
DV PI	0.3 (0.1)	0.3 (0.1)	0.3 (0.1)
UA PI	1.1 (0.1)	1.1 (0.2)	1.1 (0.1)

* $p<0.05$ compared with baseline

64 School-age outcomes of late preterm infants

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OBJECTIVE: In the United States the late preterm birth rate rose 20% from 1990 to 2006 (CDC, NCHS Data Brief, #24, 11/09), but limited data on potential cognitive sequalae of late preterm delivery are available. We compare school outcomes between moderately late preterm (MLP) infants at 32-<34 weeks, late preterm (LP) infants 34-<37 weeks, and full-term (FT) infants.

STUDY DESIGN: Birth certificate and Department of Education administrative data for children born in NYC from 1994-1998 were linked using probabilistic matching as part of the Longitudinal Study of Early Development. We included all non-anomalous singleton infants who were delivered from 32-42 weeks gestation and had a third-grade test score. Test scores were converted to T-scores, by year. Logistic regression was used to assess the risk of being recommended for special education. Linear regression was used to estimate the effect of categorized gestational age on math test scores.

RESULTS: There were 2,332 MLP, 13,207 LP and 199,599 FT singleton births with at least one test score available. Compared with FT, MLP had significantly higher adjusted odds of being recommended for special education [OR=1.26 (95% CI=1.13-1.40)], as did LP infants [OR=1.26 (95% CI=1.20-1.32)] when adjusted for birth weight and other risk factors. Compared with FT, adjusted math test T-scores were 0.97 points lower for MLP and 0.66 points lower among LP infants (p<.0001). This finding remained significant only for LP after also adjusting for birth weight (p=0.01).

CONCLUSIONS: Compared with children born FT, children born MLP and LP are more likely to be recommended for special education.