**Student ID:** 197

**Title:** Umbilical Artery Doppler Pulsatility Index for Predicting PPROM and Adverse Neonatal Outcomes

**Background:**

While known risk factors with a strong association with preterm premature rupture of the fetal membranes (PPROM) exist, the field currently lacks means of predicting PPROM. Underlying intrauterine inflammation has been identified in nearly 50% of patients with PPROM, with approximately half of these cases being culture-negative intrauterine inflammation. Previous animal studies in rodents and rhesus macaques have indicated that umbilical artery Doppler pulsatility index (UA-PI) may be associated with perinatal outcomes following fetal exposure to intrauterine inflammation/infection. Recently, a clinical PPROM prediction model has been reported with fair predictive value, with need for further refinement (El-Achi V et al, 2020). The objective of this study was to assess the predictive value of the biophysical covariate UA-PI for PPROM and associated adverse neonatal outcomes.

**Methods:**

This was a prospective cohort study of liveborn non-anomalous chromosomally normal infants admitted to the neonatology intensive care unit from April 2009 to March 2016. Women with pregnancies complicated by PPROM were compared to gestational age-matched controls without PPROM. The area under the receiver operating characteristic curves (AUC) evaluated UA-PI for prediction of PPROM and associated adverse neonatal outcomes.

**Results:**

Of 1,145 high-risk gestations studied, 262 (23%) were complicated by PPROM. Multivariable analysis identified UA-PI (AOR 1.24, 95% CI 1.18-1.31, P=0.002) as an independent risk factor for PPROM. The AUC for UA-PI and PPROM, with maternal age, parity, and type of gestation, was 0.65 (95% CI 0.62-0.68); the optimal UA-PI threshold was 0.95% (26% sensitivity, 73% specificity). The AUC for IA-PI and adverse fetal outcomes, with exposure to magnesium and steroid therapy, was 0.75 (95% CI 0.72-0.77).

**Conclusion:**

UA-PI is moderately predictive of PPROM, and inclusion in a clinical predictive model for PPROM in high-risk pregnancies is justified. UA-PI is predictive of associated adverse fetal outcomes.

**Freeform Abstract:**