Prediction of Neonatal Birthweight associated with Maternal Obesity and Diabetes

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**SI/CTR Abstract**

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**Prediction of Neonatal Birthweight associated with Maternal Obesity and Diabetes**

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**Introduction**

To design a model that will predict neonatal birth weight within obese mothers by diabetic status.

**Methods**

A secondary data analysis of an RCT (NCT 02909582) was utilized to create a neonatal birth weight prediction model. Women (n=325) with a BMI > 35 kg/m$^2$ from a tertiary academic institution, 2016 – 2019, were included to estimate the risk of large for gestational age (LGA) infants and neonatal birth weight based on maternal pre-pregnancy BMI and diabetic status. LGA was defined as an infant birth weight > 90th percentile. Analysis included Chi-square, t-test, multivariate logistic and linear regression.

**Results**

Mean birthweight did not differ in obese mothers based on diabetic status. The frequency of large for gestational age infants was significantly greater for diabetic mothers (17% vs 7% without diabetes, p=0.024). Total pregnancy weight gain (continuous, lbs) (OR 1.03; 95% CI 1.01, 1.05; p=0.016) and pre-pregnancy BMI (continuous, OR 1.08; 95% CI 1.01, 1.15; p=0.018) were associated with the risk of LGA
infants when accounting for demographics (model $R^2 = 0.074$). The presence of diabetes (RR 146; 95% CI 24, 268; $p=0.019$), total weight gain (lbs) (RR 4; 95% CI 1, 7; $p=0.015$), and gestational age (RR 197; 95% CI 175, 220; $p<0.001$) were associated with neonatal birth weight when accounting for demographics (model $R^2 = 0.550$).

**Discussion**

These models incorporate the joint effects of maternal obesity and diabetic status in predicting neonatal birthweight, thereby enabling clinicians to counsel their high-risk patients on risk for large for gestational age infants.