1-2020

Prediction of Neonatal Birthweight associated with Maternal Obesity and Diabetes

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SI/CTR Abstract

Word count: 250 words

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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.