AAP DISTRICT VIII SECTION ON NEONATAL PERINATAL MEDICINE

2021 ANNUAL CONFERENCE **ORIGINAL RESEARCH** (BASIC SCIENCE or CLINICAL)
ABSTRACT SUBMISSION FORM

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DEADLINE FOR RECEIPT OF ABSTRACT IS FEBRUARY 19, 2021. Submissions will be accepted for either poster or oral presentation. Authors will be notified of acceptance and format for presentation (poster or poster symposium) by **March 12, 2021.**

Title: The Effect of Maternal Blood Glucose Control on Infant Body Fat at Birth

Authors: Lauren Staiger, MD; Kara Wong Ramsey, MD, James Davis PhD, Sheree Kuo, MD

Institution: Kapiolani Medical Center for Women and Children; University of Hawaii John A. Burns School of Medicine

Background:

There is emerging evidence that increased body fat percentage at birth may be tied to increased risk of obesity later in life. There is limited data on the effect of maternal diabetes and glucose control on infant body composition at birth. Air displacement plethysmography (ADP) has been widely used to assess infant body composition. Our objectives are to determine whether well appearing infants of diabetic mothers (IDM) and infants of non-diabetic mothers (Controls) have significant differences in body composition at birth and to assess the effect of maternal blood glucose and HgbA1C during pregnancy on body composition of IDM.

Methods:

We recruited 132 infants of mothers with gestational diabetes or pregestational diabetes between 35 and 41 weeks gestational age admitted to the newborn nursery. Infant body fat percentage was measured with the Pea Pod ADP system within the first three days of life. Maternal self-reported blood glucose logs and HgbA1C were collected from local gestational diabetes management clinics. Our control group is a historical cohort of 249 infants of mothers with uncomplicated pregnancies recruited from the same newborn nursery in 2014. Welch Two Sample t-test was used to compare body fat percentage of IDM with our control group. Unadjusted linear regression was used to measure the effect of maternal HgbA1C and average daily fasting glucose on infant body fat percentage at birth.

Results:

Our IDM group was significantly different from our control group in maternal age, gestational weight gain, and gestational age at delivery. (33 years vs 29 years, 27 vs 34 lbs, 38 vs 39 weeks, respectively; $p<0.01$ for all variables). Overall, the IDM population had good glycemic control with a mean fasting blood glucose of 88.5 mg/dL(SD +/- 8.8 mg/dL) and a mean HgbA1C of 5.9% (SD +/- 1%). Our study demonstrated that IDM had a statistically significant but small increase of 1% body fat compared to controls (+1.03 percent body fat for IDM group; 95% CI 0.03-2.03; $p=0.04$). Unadjusted linear regression demonstrated a statistically significant relationship between fasting blood glucose during pregnancy and infant percent body fat at birth. (0.19% increase in body fat for every mg/dL increase in fasting blood glucose, standard error 0.05, $p<0.01$). There was not a significant relationship between HgbA1C and infant percent body fat at birth. Analysis of post prandial glucose levels is ongoing. Multivariate analyses adjusting for demographic and pregnancy factors shown to affect infant body composition are ongoing.

Conclusion:

The small difference in body fat between our groups is likely reflective of good glycemic control in our diabetic group, and suggests that maintaining good glycemic control during diabetes can help reduce the risk of increased body fat in infants. The effect of increased body fat at birth on future obesity risk is the target of ongoing research and has yet to be fully elucidated. More research is needed to better understand the relationship between the intrauterine environment, neonatal body composition and the future development of cardiometabolic disease.