Maternal Periconceptional Stressors, Mediterranean Diet Adherence, and Child Outcomes

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Objectives: To evaluate the relationships between maternal periconceptional Mediterranean diet adherence and 1) maternal periconceptional BMI, 2) subsequent maternal depression during pregnancy, 3) prenatal inflammatory cytokine IL-17A, 4) child birthweight, and 5) child weight-for-height at ages 0–8 years in African American, Hispanic and White mother-child dyads from the Newborn Epigenetics STudy (NEST).

Methods: Food frequency questionnaires were used to estimate periconceptional Mediterranean diet adherence in mothers. Maternal depression during pregnancy was assessed using the Centers for Epidemiological Studies Depression scale. Weight and height were measured in children between birth and age 8 years. Linear and logistic regression models were used to examine associations between maternal adherence to a Mediterranean diet, inflammatory cytokines and pregnancy and postnatal outcomes, adjusted for education, maternal age at delivery, maternal smoking, gestational age, age and sex of child, breastfeeding, parity, maternal BMI.

Results: Adherence to a Mediterranean diet varied widely by ethnicity with > 55% of White mothers reporting high adherence during the periconceptional period, compared to 22% of Hispanic mothers, and 18% of African American mothers ($P < 0.05$). Higher adherence to this diet was associated with lower risk of depressive mood ($\beta = -0.45$, $p = 0.02$) and pre-pregnancy obesity ($\beta = -0.29$, $p = 0.05$). Higher maternal adherence to this diet pattern was also associated with lower body weight at birth, that was maintained to ages 3–5 and 6–8 years—these associations were most apparent in White children (3–5 years: $\beta = -2.9$, $p = 0.02$; 6–8 years: $\beta = -3.99$, $p = 0.01$). Higher diet adherence was associated with lower levels of prenatal IL-17A levels in African American mother-child dyads ($\beta = 0.21$, $p = 0.03$).

Conclusions: Our data suggest that maternal Mediterranean diet adherence provides a potent avenue by which effects of prenatal stressors on maternal and fetal outcomes can be mitigated to reduce ethnic disparities in childhood obesity.

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