

Infant Temperament: Exploring The Potential Role of Maternal Dietary Choline and Folate Consumption During Pregnancy in a Michigan Pregnancy Cohort

Daelah Nicholas,¹ Chia-Lun Yang,² Nicole Talge,² and Jean Kerver²

¹Midwood High School and ²Michigan State University

Objectives: Choline and folate are important nutrients involved in fetal brain development, but relationships between diet and infant temperament—an outcome potentially related to neurobehavioral development—have not been widely explored. Our objective was to examine associations between maternal dietary choline and folate intake during pregnancy and infant temperament assessed at 9 months.

Methods: Participants from the Michigan Archive for Research on Child Health (MARCH) prospective pregnancy cohort were included in this analysis ($n = 89$, mean age [SD] = 30.4 ± 5.5 y). Maternal dietary intake was assessed in mid-pregnancy with the Automated Self-Administered 24-hour Dietary Assessment Tool (ASA24). Infant temperament was assessed by parent report using the Infant Behavior Questionnaire-Revised Very Short Form (IBQ-VSF) at the infant 9-month visit (range 8–16 months; mean [SD] 287 ± 31 days after birth). Participants were included if they had data from at least one ASA24 and

the IBQ-VSF assessment. Where applicable, the average of two ASA24s was used ($n = 45$). For twins, infant data was randomly selected to include only one twin ($n = 2$ mother-child pairs). Independent t-tests were used to assess mean differences in nutrient intake by maternal sociodemographic characteristics. Pearson correlations were used to examine relationships between maternal nutrient consumption and infant temperament scores.

Results: Neither folate nor choline intake differed significantly by maternal age, education, marital status, or income. Choline intake varied by work status (418.76 ± 197.01 mg [not working/part-time] vs. 337.70 ± 150.34 mg [full-time], $p = 0.033$). Maternal choline intake was related to infant Positive Affect/Surgency, $r = 0.213$, $p = 0.045$; when data were limited to the subset with two ASA24s ($n = 45$), the relationship was no longer significant $r = 0.262$, $p = 0.083$. No significant relationships between maternal folate intake and infant temperament were observed.

Conclusions: Pregnancy dietary folate was not associated with parent-reported temperament at 9 months, but we observed an association between pregnancy dietary choline and Positive Affect/Surgency in infants. In addition to replicating these findings, more research is needed to examine the plausibility of associations reported here.

Funding Sources: Funded in part by a grant from the NIH ECHO program.