

Enduring Benefits of Prenatal Choline Supplementation in 7-y-Olds: Enhanced Attention Task Performance (OR11-01)

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Objective: The aim of this study was to test the hypothesis that maternal choline supplementation during the third trimester improves offspring attentional function at age 7 y. Animal studies have provided strong evidence that maternal choline supplementation improves offspring cognition, including attention, but few experimental studies have evaluated this intervention in humans.

Methods: Healthy, third trimester pregnant women ($n = 26$) were randomly assigned to consume either 480 mg choline/d (approximately Adequate Intake) or 930 mg choline/d from gestational wk 27 until delivery as part of a controlled-feeding study to evaluate the effects of maternal choline intake on maternal/fetal biomarkers of choline metabolism. All food (providing ~ 380 mg choline/d), choline supplements (100 or 550 mg choline/d), and prenatal vitamins were provided by the study. An ancillary, long-term follow-up was conducted to assess cognitive and affective functioning, including attention, in the offspring at age 7 y ($n = 20$). Children performed a computer-based signal detection task, the Sustained Attention Task (SAT), which requires participants to report the presence or absence of a small visual signal of variable duration (17, 29, or 50 ms). Data were analyzed by the use of mixed models, and post hoc pairwise comparisons were corrected for multiple comparisons.

Results:

A significant main effect of signal duration was seen for SAT score (composite measure of performance integrating signal and nonsignal trials) and percentage correct (overall performance evaluated for each signal duration and for nonsignal trials), such that performance was poorer for the 17- vs. 29- or 50-ms trials (all $P < 0.0001$). Mean SAT score ($P = 0.02$) and mean percentage correct ($P = 0.02$) were significantly greater for the 930-mg (vs. 480-mg) choline/d group, effects that did not vary by signal duration or trial type.

Conclusions:

Maternal choline intake of 930 (vs. 480) mg/d during the third trimester improves child performance on a sustained attention task at age 7 y. These data provide important new evidence that prenatal choline supplementation improves offspring cognitive functioning in humans and highlight the potential benefits of increasing choline intake during pregnancy in light of evidence

that ~85% of pregnant women in the US consume choline in amounts below the Adequate Intake.

Supporting Images/Graphs

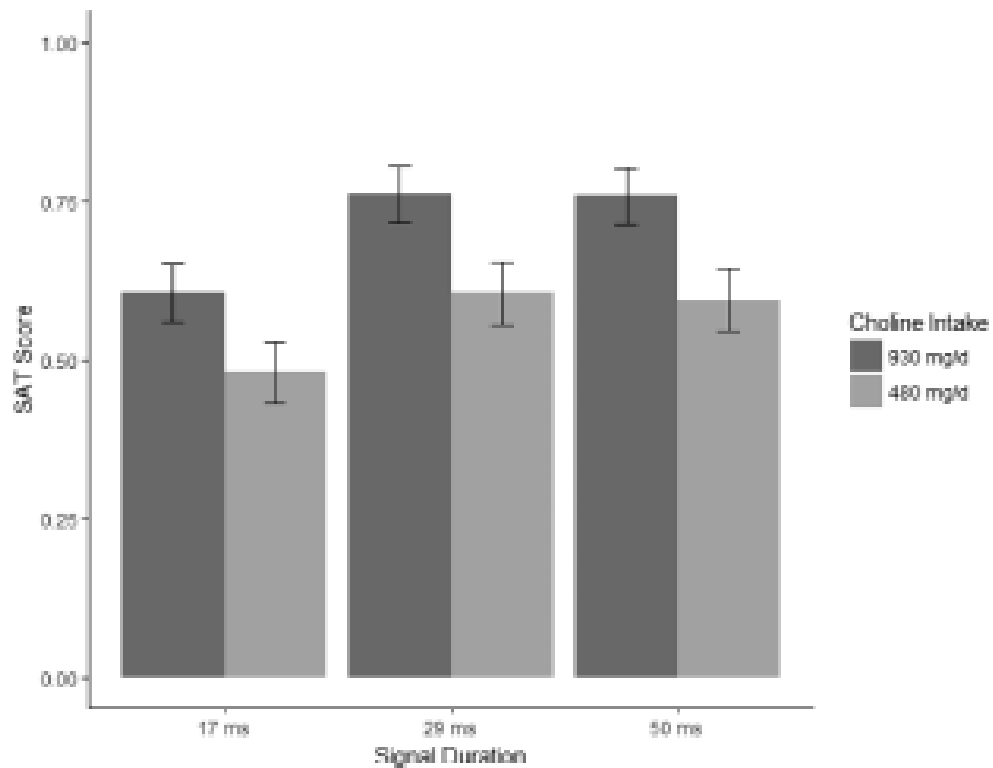


FIGURE OR11-01-1 SAT Score by third trimester choline intake and signal duration

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