

Choline intake during pregnancy and child cognition at age 7 years

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Abstrak

Animal models indicate that exposure to choline in utero improves visual memory through cholinergic transmission and/or epigenetic mechanisms. Among 895 mothers in Project Viva (eastern Massachusetts, 1999-2002 to 2008-2011), we estimated the associations between intakes of choline, vitamin B12, betaine, and folate during the first and second trimesters of pregnancy and offspring visual memory (measured by the Wide Range Assessment of Memory and Learning, Second Edition (WRAML2), Design and Picture Memory subtests) and intelligence (measured using the Kaufman Brief Intelligence Test, Second Edition (KBIT-2)) at age 7 years. Mean second-trimester intakes were 328 (standard deviation (SD), 63) mg/day for choline, 10.5 (SD, 5.1) μ g/day for vitamin B12, 240 (SD, 104) mg/day for betaine, and 1,268 (SD, 381) μ g/day for folate. Mean age 7 test scores were 17.2 (SD, 4.4) points on the WRAML 2 Design and Picture Memory subtests, 114.3 (SD, 13.9) points on the verbal KBIT-2, and 107.8 (SD, 16.5) points on the nonverbal KBIT-2. In a model adjusting for maternal characteristics, the other nutrients, and child's age and sex, the top quartile of second-trimester choline intake was associated with a child WRAML2 score 1.4 points higher (95% confidence interval: 0.5, 2.4) than the bottom quartile (P-trend = 0.003). Results for first-trimester intake were in the same direction but weaker. Intake of the other nutrients was not associated with the cognitive tests administered. Higher gestational choline intake was associated with modestly better child visual memory at age 7 years.