

Abstract

Low Maternal Iodine Status in Early Pregnancy Is Associated with Cognitive and Language Delays at 24 Months in Non-Users of Nutritional Supplements [†]

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Abstract: Background: Severe maternal iodine deficiency has profound consequences for the developing brain; however, the impact of mild to moderate deficiency is less clear, and findings from observational studies have been mixed. Aim: The purpose of this study is to assess the relationship between maternal iodine status in early pregnancy and infant neurological development in an Irish maternal–infant cohort. Methods: Maternal–infant dyads of the Improved Pregnancy Outcomes by Early Detection (IMPROVED) and the Cork Nutrition and Development (COMBINE) cohorts (*n* 456) were followed during pregnancy and from birth to 2 years of age. Participants completed detailed a clinical and questionnaire-based assessments (including Bayley's Scale of Infant Development (BSID-III) at 24 months; *n* 295). Maternal urinary iodine concentration (UIC) was quantified at 15 weeks of gestation by the Sandell–Kolthoff (S-K) method, and urinary creatinine (Cr) was quantified by the Jaffe rate method using the RX Monaco Clinical Chemistry Analyser (Randox Laboratories Ltd.). Statistical analysis was performed using IBM SPSS Version 27 (IBM Corp., Armonk, NY, USA). Results: The median (IQR) maternal age at delivery was 32 (5) years, and the median (IQR) BMI at 15 weeks of gestation was 25.1 (5.0) kg/m². Three-quarters completed third-level education, 95% were in a relationship and 7% were smokers. Median (IQR) UIC was 118 (132) µg/L, and 65% had UIC < 150 µg/L. At 24 months, median (IQR) cognitive, language and motor composite scores were 105 (15), 103 (20) and 103 (14), respectively. Cognitive, language and motor developmental delay was indicated in 6.0, 7.8 and 0.4% of children, respectively. Though a slightly higher prevalence of developmental language delay was observed among infants of mothers with UI:Cr < 150 µg/g for language (11 versus 6%) and a combined cognitive/language outcome (10 versus 4%), when adjusted for education, marital status, gestational age and birthweight, UI:Cr was not associated with language delay (aOR (95% CI): 1.7 (0.6, 4.7)). Among non-users of iodine supplements (29% of sample; median (IQR) UIC: 84 (96) µg/L; 75% < 150 µg/L), for every 10 µg/L increase in UIC, we observed a 23% and 19% reduction in odds of cognitive and language delay, respectively (aOR (95% CI): 0.77 (0.71, 0.97), *p* = 0.029; 0.81 (0.66, 0.99), *p* = 0.035). Our findings highlight the importance of sufficient iodine status in early pregnancy.

Keywords: maternal iodine status; infant neurodevelopment; pregnancy



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