Iodine deficiency in British pregnant women predicts poor birth outcomes but not later child development

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In pregnant women with mild-to-moderate iodine deficiency in the 2nd trimester, poorer maternal iodine status was associated with low birthweight but did not predict child development at age 4–7 years

Iodine intakes in British pregnant women should be increased to ensure they have healthy children

Pregnant women in countries without salt iodization programs are at particular risk of deficiency if they have low intakes of dairy, fish, or meat. In the UK and Western Europe, iodine intake remains potentially inadequate, particularly in vulnerable groups. For example, of the 31 European countries that have assessed iodine intake in pregnancy, two thirds reported inadequate intakes based on urinary iodine excretion (< 150 μg/L, the WHO threshold for iodine insufficiency in pregnant populations), but there is little evidence for the functional importance of this threshold.

There is no salt iodization program and, surprisingly, no pregnancy-specific recommendations for iodine intake in the UK. Commissioned by the Department of Health for England, two new studies of a large and well-characterised cohort of UK women report on maternal UIC and iodine/creatinine ratios (I:Cr) measured in 6971 UK mothers at 26–28 weeks' gestation, and potential links to birth outcomes and child development. The cohort was multi-ethnic with 43% of participants in this study being of White European background and 43% being of Pakistani ethnic background.

A total of 7066 urine samples were provided by 6979 mothers (some women participated during successive pregnancies), from which iodine status was calculated. Birth outcomes assessed included birthweight, small for gestational age (SGA), head circumference and APGAR score. In later childhood, the authors applied a comprehensive range of key neurodevelopmental domains in their offspring including objective measures of school achievement, standardized assessments of sensorimotor control and literacy, and teacher-reported assessments of emotional and behavioral development.

Median (interquartile range) UIC was 76 μg/L (46, 120), and I:Cr was 83 μg/g (59, 121) indicating moderate maternal iodine deficiency. There was a positive association between I:Cr and birthweight: for a typical participant, the predicted birthweight centile at the 25th percentile of I:Cr (59 μg/g) was 2.7 percentage points lower than that at the 75th percentile of I:Cr (121 μg/g), birthweight was predicted to be 41 g lower and the predicted probability of SGA was 1.9 percentage points higher. There was no evidence of associations using UIC or other birth outcomes, including stillbirth, preterm birth, ultrasound growth measures or congenital anomalies.

Maternal iodine status was then examined in relation to child school achievement, other learning outcomes, social and behavioral difficulties, and sensorimotor control in 5745 children aged 4–7 years. Overall, there was no strong or consistent evidence to support associations between UIC or I:Cr and neurodevelopmental outcomes. For instance, predicted child school achievement at the 25th vs 75th I:Cr percentiles were similar, with no evidence of associations.

In the largest single study of its kind, which provided sufficient power for detecting even small associations, lower maternal iodine status was weakly associated with lower birthweight and greater probability of SGA. Whilst small, the effect size for lower iodine on birthweight is comparable to environmental tobacco smoke exposure. In contrast, there was little evidence of detrimental neurodevelopmental outcomes in children born to pregnant women with iodine insufficiency as defined by WHO–outlined thresholds. The authors concluded that because iodine deficiency is easily avoidable, strategies to avoid deficiency in women of reproductive age in the UK should be considered.