Association of maternal iodine status with child IQ: a meta-analysis of individual-participant data.

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Abstract

CONTEXT:

While the consequences of severe iodine deficiency are beyond doubt, the effects of mild-to-moderate iodine deficiency in pregnancy on child neurodevelopment are less well established.

OBJECTIVE:

To study the association between maternal iodine status during pregnancy and child IQ and to identify vulnerable time-windows of exposure to suboptimal iodine availability.

DESIGN:

Meta-analysis of individual-participant data from three prospective population-based birth cohorts: Generation R (The Netherlands), INMA (Spain), and ALSPAC (United Kingdom); pregnant women were enrolled between ٢٠٠٢-٢٠٠٦, ٢٠٠٣-٢٠٠٨, and ١٩٩٠-١٩٩٢, respectively.

SETTING:

General community.

PARTICIPANTS:

٦١٨٠ mother-child pairs with measures of urinary iodine and creatinine concentrations in pregnancy and child IQ. Exclusion criteria were multiple pregnancy, fertility treatment, medication affecting the thyroid, and pre-existing thyroid disease.

INTERVENTION(S):

None.

MAIN OUTCOME MEASURE:

Child non-verbal and verbal IQ assessed at ١,٥-٨ years of age.

RESULTS:

There was a positive curvilinear association of the urinary iodine-to-creatinine ratio (UI/Creat) with mean verbal IQ only. UI/Creat < ١٥٠ μg/g was not associated with lower non-verbal IQ [-٠,٦ points, ٩٥٪ CI -١,٧ to ٠,٤, P=٠,٢٤٦] or lower verbal IQ [-٠,٦, ٩٥٪ CI -١,٣ to ٠,١, P=٠,٠٨٢]. Stratified analyses showed that the association of UI/Creat with verbal IQ was only present up to ١٤ weeks of gestation.

CONCLUSIONS:

Fetal brain development is vulnerable to mild-to-moderate iodine deficiency, particularly in the first trimester. Our results show that any potential randomized, controlled trial investigating the effect of iodine supplementation in mild-to-moderate iodine deficient women on child neurodevelopment, should start with supplementation not later than the first trimester.

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