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IODINE AND PREGNANCY

Mild to moderately low levels of iodine in early pregnancy may be associated with lower verbal IQ in children

BACKGROUND

The thyroid gland uses iodine to make thyroid hormones. If there is not enough iodine in the diet, thyroid hormone levels fall and can cause hypothyroidism. Indeed, iodine deficiency is a common cause of hypothyroidism world-wide. Thyroid hormone is required for normal brain development in the baby during pregnancy. Severe hypothyroidism can cause abnormal brain development and low intelligence. Similarly, if the mother is severely deficient in iodine in early pregnancy, the child may also have low intelligence. On the other hand, the effects of mild or moderate iodine deficiency is not well known. The effects of mother's iodine levels during different periods of pregnancy have not been studied previously. The aim of this study was to assess the association between mother's iodine status in pregnancy and child IQ, and to investigate the association at different pregnancy periods.

THE FULL ARTICLE TITLE

Levie D et al Association of maternal iodine status with child IQ: a meta-analysis of individual-participant data. J Clin Endocrinol Metab. Epub Mar 28. PMID: 30920622

SUMMARY OF THE STUDY

The study was done using data from three European pregnancy groups from Netherlands, the United Kingdom, and Spain. They included mother-child pairs if mother's urinary iodine and creatinine levels were checked during pregnancy and if the child IQ test results were available. Two main types of intelligence were tested. Verbal IQ is the ability to solve problems using language. Non-verbal IQ is the ability to reason without using words. They excluded multiple pregnancies, use of fertility treatment, known thyroid disease, or use of medications that could affect the thyroid. Since the measurements were done by different methods researchers used techniques to standardize the values so they were able to compare 3 different groups.

The study included 6180 mother-child pairs. Urine samples were collected around 12-14 weeks of pregnancy. Urine iodine-to-creatinine ratios were used to assess mother's iodine status. Urine iodine-to-creatinine ratios were 159 mcg/L in the group from The Netherlands (iodine sufficient), 128 mcg/L in the group from Spain (mildly iodine deficient) and 96 mcg/L in the United Kingdom group (moderately iodine deficient). Associations between iodine status and child verbal IQ were seen during the first 12 weeks but not after 14 weeks of pregnancy. Urine iodine-to-creatinine ratios were not associated with the child's non-verbal IQ or mother's TSH or free T_4 levels.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study shows that lower urinary iodine-to-creatinine ratios up to 14th week of pregnancy were associated with poorer child verbal IQ scores. This is important to patients because timing of iodine supplementation may be critical for the development of baby's language ability. The American Thyroid Association recommends women who are planning pregnancy, pregnant, or lactating should take 150 mcg of iodine. Ideally, iodine supplementation should start 3 months prior to pregnancy. We need future studies evaluating the effect of this strategy.

— Ebru Sulanc, MD

ATA THYROID BROCHURE LINKS

Iodine Deficiency: https://www.thyroid.org/iodine-deficiency/

Hyperthyroidism in Pregnancy: https://www.thyroid.org/hyperthyroidism-in-pregnancy/

IODINE AND PREGNANCY, continued

ABBREVIATIONS & DEFINITIONS

Iodine: an element found naturally in various foods that is important for making thyroid hormones and for normal thyroid function. Common foods high in iodine include iodized salt, dairy products, seafood and some breads.

Hypothyroidism: a condition where the thyroid gland is underactive and doesn't produce enough thyroid hormone. Treatment requires taking thyroid hormone pills.