



HYPOTHYROIDISM

First-trimester maternal thyroid function is not associated with child scores on standardized educational tests

BACKGROUND

Thyroid hormone is necessary for development and growth of brain in developing babies during pregnancy. It is well known that untreated overt hypothyroidism in the mother can have significant effects on the brain development of their children. Due to this important role of thyroid hormone, numerous research studies have been conducted in the past to address the relationship between thyroid hormone levels in pregnant women and the status of intelligence and brain development in their children. The brain development affected is the brain's ability and performance in the areas of learning, social skills, focus, attention as well as motor function (for example learning to ride a bike).

So far, the results of these studies have been somewhat different from each other but a evaluation of 37 studies showed that even subclinical hypothyroidism and low thyroid hormone levels without hypothyroidism may be associated with some developmental problems in children. However none of the past research studies evaluated the performance of the children born from mothers with thyroid problems in educational exams.

This present study was aimed to assess any potential relationship between the results of standardized educational assessment tests of children and the thyroid function status of their mother at the time of pregnancy.

THE FULL ARTICLE TITLE

Nelson SM et al 2018 Maternal thyroid function and child educational attainment: prospective cohort study. British Medical Journal; 360:k452. PMID: 29463525

SUMMARY OF THE STUDY

From 1990 to 1992, a total of 14,541 pregnant women were enrolled in a study called Avon Longitudinal Study of Parents and Children (ALSPAC) in Birmingham, England. The study followed the children and their parents for the following two decades. The scores of National Standardized tests taken by the children were used in this study. The tests were done at certain ages. At school entry (ages 4 to 5), every child was assessed for language, math, social skills,

problem-solving and motor skills. National tests were done at ages 7, 11 and 14 covering English, math and science subjects. At age 16, at the end of secondary education, students took an examination called GCSE.

The results of thyroid function tests in the first trimester of pregnancy were available for 4615 of women in this study. Among these women, 0.7% had overt hypothyroidism, 3.6% had subclinical hypothyroidism, 2% had isolated low thyroid hormone levels, 1.2% had subclinical hyperthyroidism and 0.87% had overt hyperthyroidism. Overall, 10% of all women had positive TPO antibodies.

The authors then studied the association between the test results and the thyroid function status of mothers during pregnancy. Any other factor that could influence this association was also considered in the interpretation of the result. Those were education of both parents, age, ethnicity, number of children, smoking status and alcohol use of mother as well as birth weight and sex of babies, gestational age at the time of birth, the method of delivery and head circumference at the time of birth.

No significant relationship was found between the result of thyroid function tests in mothers and the test scores in their children.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The strength of this study was the large number of subjects and the long duration of follow up. But it is important to mention that the absolute number of mothers who had thyroid disease was relatively small.

Although this study showed no relationship between thyroid dysfunction in mothers and the test performance of their children in school, more studies needs to be done in the future to confirm the these results and helps us to better understand whether treatment is necessary for pregnant women who have mild thyroid disease during pregnancy.

— Shirin Haddady, MD





HYPOTHYROIDISM, continued

ATA THYROID BROCHURE LINKS

Hyperthyroidism (Overactive): <https://www.thyroid.org/hyperthyroidism/>

Hypothyroidism (Underactive): <https://www.thyroid.org/hypothyroidism/>

Thyroid Disease and Pregnancy: <https://www.thyroid.org/thyroid-disease-pregnancy/>

Thyroid Function Tests: <https://www.thyroid.org/thyroid-function-tests/>

ABBREVIATIONS & DEFINITIONS

Subclinical Hypothyroidism: a mild form of hypothyroidism where the only abnormal hormone level is an increased TSH. There is controversy as to whether this should be treated or not. Hypothyroidism is a condition where the thyroid gland is underactive and doesn't produce enough thyroid hormone.

Hypothyroxinemia: decrease in the blood level of thyroxine (T₄) without change in the level of thyroid stimulating hormone

Overt Hypothyroidism: clear hypothyroidism (underactive thyroid) with an increased TSH and a decreased T₄ level. All patients with overt hypothyroidism are usually treated with thyroid hormone pills.

Subclinical Hyperthyroidism: a mild form of hyperthyroidism where the only abnormal hormone level is a decreased TSH. Hyperthyroidism is a condition where the thyroid gland is overactive and produces too much thyroid hormone.

Overt Hyperthyroidism: clear hyperthyroidism (overactive thyroid) with a decreased TSH and an increased T₄ level. Hyperthyroidism may be treated with anti-thyroid meds (Methimazole, Propylthiouracil), radioactive iodine or surgery.

TPO antibodies: these are antibodies that attack the thyroid instead of bacteria and viruses, they are a marker for autoimmune thyroid disease, which is the main underlying cause for hypothyroidism and hyperthyroidism in the United States.

