



## THYROID AND PREGNANCY

### Overtreatment of mild hypothyroidism in the mother during pregnancy may lead to behavior problems in the children

#### BACKGROUND

Normal thyroid hormone levels in the mother during pregnancy is critical for normal brain development in the baby. Many studies have shown the importance of maintaining normal thyroid hormone levels during pregnancy for the best pregnancy outcomes. Earlier studies demonstrated that untreated overt hypothyroidism in the mother was associated with impaired brain development and lower IQ (intelligence quotient) scores in the children. Later studies examined the effect of milder forms of hypothyroidism in the mother on brain function in babies and did not find a benefit of thyroid hormone replacement. A large randomized controlled trial, known as the Controlled Antenatal Thyroid Screening (CATS) trial, investigated the effect of thyroid hormone treatment of women with mildly low thyroid function during pregnancy on the brain function of their children and did not find an overall benefit. The current study is an extension of the CATS trial. The investigators examined the effect of thyroid function in the mother during pregnancy on the behavior of the children as assessed by questionnaires designed to evaluate mental health, ADHD symptoms and autism spectrum symptoms. They specifically examined the effects of thyroid hormone overtreatment in the mother with mild hypothyroidism on the subsequent behavior of the children.

#### THE FULL ARTICLE TITLE

Hales C et al. Controlled antenatal thyroid screening II: Effect of treating maternal suboptimal thyroid function on child behavior. *J. Clin. Endocrinol. Metab.* 2020. 105:e417-e427. PMID: 3166532

#### SUMMARY OF THE STUDY:

The CATS trial is a randomized trial of thyroid hormone replacement in women living in the United Kingdom or Italy with mild hypothyroidism during pregnancy compared to a control group of women with normal thyroid levels. The investigators randomized women at approximately 13 weeks of pregnancy to either a screen or a control group. All women had blood drawn for

thyroid function (TSH, Free T<sub>4</sub>). The screen group had the measurement done immediately whereas the control group had the measurements done after pregnancy. In the screen group, if the women were found to have mild hypothyroidism, defined as either an elevated TSH or low Free T<sub>4</sub>, they were treated with 150 mcg of levothyroxine and then had doses titrated to a TSH value 0.1-1 mIU/L throughout the duration of the pregnancy. The control group of women did not receive thyroid hormone therapy during pregnancy. Women living in the United Kingdom from this original study were asked to participate in a series of questionnaires about their children's behavior when they were between the ages of 7 and 10 years (average age 9.5 years). These questionnaires included the Strengths and Difficulties Questionnaire, Child ADHD Questionnaire and the Social Communications Questionnaire, which are designed to evaluate mental health difficulties, ADHD symptoms and autism spectrum behaviors.

A total of 475 mother/child pairs completed the questionnaires for inclusion in the study. Comparisons were made between children born to mothers with *normal* thyroid function during pregnancy, mothers with *treated* mild hypothyroidism and *untreated* mild hypothyroidism. Overall, there were no significant group differences for any of the 3 questionnaires. Higher questionnaire scores indicating worse childhood behavior/mental health difficulties were noted in male children, children born to younger mothers and children from families with more social challenges. Further analyses indicated higher scores on some subsets of the questionnaires (worse behavior problems) in children born to mothers that had been overtreated (defined as a high Free T<sub>4</sub>) with thyroid hormone during their pregnancy. These data suggest that overtreatment of suboptimal thyroid dysfunction (hypothyroidism) can be associated with more childhood behavioral difficulties.

#### WHAT ARE THE IMPLICATIONS OF THE STUDY?

This study suggests that overtreatment with thyroid hormone for mild hypothyroidism in the mother during



## THYROID AND PREGNANCY, continued

pregnancy may negatively affect the behavior of children during later development. Close monitoring of thyroid function in women on thyroid hormone during pregnancy is recommended to maintain normal thyroid function

(with the goal being normal TSH and free T<sub>4</sub> levels during pregnancy).

— Whitney W. Woodmansee MD

### ATA THYROID BROCHURE LINKS

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

### ABBREVIATIONS & DEFINITIONS

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

**Subclinical/mild 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.

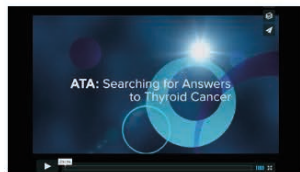
**Overt Hypothyroidism:** clear hypothyroidism an increased TSH and a decreased T<sub>4</sub> level. All patients with overt hypothyroidism are usually treated with thyroid hormone pills.

**TSH: thyroid stimulating hormone** — produced by the pituitary gland that regulates thyroid function; also the best screening test to determine if the thyroid is functioning normally.

**Thyroxine (T<sub>4</sub>):** the major hormone produced by the thyroid gland. T<sub>4</sub> gets converted to the active hormone T<sub>3</sub> in various tissues in the body.

**ADHD:** Attention Deficit Hyperactivity Disorder

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