



HYPOTHYROIDISM AND PREGNANCY

Low thyroid levels during pregnancy is associated with abnormal metabolism in the mother

BACKGROUND

It is clear that pregnant women with clear hypothyroidism (low thyroxine level and increased TSH level) have an increased risk of problems with their pregnancy as well as problems with their child's development, especially in brain development. Multiple studies have also reported that mild hypothyroidism (normal thyroxine level and increased TSH level) can cause the same problems at a lower rate. There are few, if any studies looking at the effects of hypothyroxinemia (low thyroxine level and normal TSH level) during pregnancy. Only a few studies have investigated possible abnormalities in the mother women with hypothyroidism or hypothyroxinemia during pregnancy. In particular, metabolic abnormalities, such as abnormal weight gain, increased triglyceride (fat) levels and a tendency toward diabetes, are frequently seen in non-pregnant patients with hypothyroidism. The goal of this study is to compare the frequency of metabolic abnormalities in pregnant women with mild hypothyroidism and/or hypothyroxinemia with those seen in pregnant women with normal thyroid function.

THE FULL ARTICLE TITLE

Knight BA et al. Maternal hypothyroxinaemia in pregnancy is associated with obesity and adverse maternal metabolic parameters. *Eur J Endocrinol* 2016;174:51-7.

SUMMARY OF THE STUDY

This is a study of 956 healthy, non-diabetic, white pregnant women who were enrolled in the Exeter Family Study of Childhood Health, UK from 1999 to 2004. The average age was 30.1 years and the average body mass index (BMI) was 27.9 kg/m². Height and weight were measured and fasting blood samples for thyroid and metabolic tests were collected at 28 weeks of pregnancy. A total of 133 (13.9%) women had subclinical hypothyroidism and 82 (8.6%) had hypothyroxinemia.

Women with hypothyroxinemia had higher BMI, glucose and triglyceride levels than women with normal thyroid function. There was no difference in these parameters between women with mild hypothyroidism and those with normal thyroid function.

In the entire group of pregnant women, the lower the free T₄ levels, the higher the BMI, glucose and triglyceride levels. TSH levels in the mother did not correlate with any metabolic parameter.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study demonstrates that hypothyroxinemia in the mother is associated with worse metabolic abnormalities, including increased obesity and higher glucose and triglyceride levels as compared to pregnant women with normal thyroid function, similar to findings of a prior smaller study. Surprisingly, this study showed no difference in metabolic abnormalities between pregnant women with subclinical hypothyroidism and those with normal thyroid function. It is not known whether obesity in the mother results in the thyroid abnormalities and metabolic changes or whether the thyroid abnormalities causes obesity and the metabolic changes in pregnancy. Further studies are needed to find the free T₄ threshold to diagnose maternal hypothyroxinemia and whether thyroid hormone treatment for this condition has benefits for either the mother or the baby.

— Alina Gavrilă, MD, MMSC

ATA THYROID BROCHURE LINKS

Hypothyroidism: <http://www.thyroid.org/hypothyroidism/>

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

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


HYPOTHYROIDISM AND PREGNANCY, continued
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 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.

Hypothyroxinemia: a condition characterized by a low thyroxine (T_4) level in the blood with a normal TSH level.

Thyroxine (T_4): the major hormone produced by the thyroid gland. T_4 gets converted to the active hormone T_3 in various tissues in the body. Free T_4 is the T_4 that is not bound to proteins and affects the function of different body tissues.

Triiodothyronine (T_3): the active thyroid hormone, usually produced from thyroxine.

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.

Metabolism: all the chemical processes in the body, especially those that cause food to be processed to produce energy and result in body growth.

Body-mass index (BMI): a standardized measure of obesity calculated by dividing the weight by the square of the height. A normal BMI is 18.5-24.9, overweight is 25-30 and obese is >30 kg/m².

Triglycerides: a major form of fat circulating in the blood and stored by the body.

MARCH
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