



HYPOTHYROIDISM

Childhood weight gain and obesity are associated with adult hypothyroidism and autoimmune thyroid disease

BACKGROUND

The thyroid hormones regulate the body's metabolic rate which is also involved in weight gain and loss. Hypothyroidism lowers the metabolic rate and can be associated with weight gain, as has been shown in many studies. Indeed, obesity is associated with increased levels of thyroid stimulating hormone (TSH) into the hypothyroid range which then decrease with weight loss. Also, there is some evidence that obese adults are more likely to have positive TPO antibodies than do normal weight adults. TPO antibodies indicate the presence of autoimmune thyroid disease which is the most common cause of hypothyroidism in the United States. This study was designed to examine the relationship between childhood weight gain and subsequent hypothyroidism and autoimmune thyroid disease in adults aged 60-64.

THE FULL ARTICLE TITLE

Ong KK et al on behalf of the Medical Research Council National Survey of Health Development Scientific Data Collection Teams. Childhood weight gain and thyroid autoimmunity at age 60-64 years: the 1946 British Birth Cohort Study. *J Clin Endocrinol Metab.* February 22, 2013 [Epub ahead of print].

SUMMARY OF THE STUDY

As part of the United Kingdom Medical Research national Council Survey of Health and Development, 2547 women and 2815 men born during a single week in 1946 were followed until age 64. Birth weight and height and weight were measured at multiple time points. At ages 60 to 64, 3163 subjects were sent a survey with questions about thyroid disease and 2143 individuals underwent blood tests for TSH, free thyroxine (free T₃) and anti-TPO. The effect of being overweight or obese at age 14 and weight gain between 0 and 14 years on later thyroid status at age 60-64 was examined.

At ages 60-64, 10.9% of women and 2.3% of men were taking thyroid hormone supplementation (levothyroxine) and 11.5% of women and 3.3% of men had TPO antibodies. Women who were taking levothyroxine had higher body mass index and weight than women not taking thyroid hormone and had higher body weights at all time points beginning at age 6 years. Body weight also was higher in adult women who had TPO antibodies in their blood. Women who showed a greater weight gain between birth and age 14 also had an increased likelihood of levothyroxine use and for the presence of TPO antibodies at age 60-64. None of these associations were observed in men.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study showed that more rapid weight gain in childhood is associated with an increased risk for hypothyroidism and presence of autoimmune thyroid disease later in life in women, but not in men. However, childhood obesity at age 14 is associated with the occurrence of adult hypothyroidism in both sexes. Although this study has a number of limitations, it does suggest that the marked increase in overweight and obese children and adolescents in the United States may result in an increase in adult hypothyroidism and thyroid autoimmunity in the future.

— Glenn Braunstein, MD

ATA THYROID BROCHURE LINKS

Hypothyroidism: <http://www.thyroid.org/what-is-hypothyroidism>

Thyroid and Weight: <http://www.thyroid.org/weight-loss-and-thyroid>

Thyroid Function Tests: <http://www.thyroid.org/blood-test-for-thyroid>

Thyroiditis: <http://www.thyroid.org/what-is-thyroiditis>

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HYPOTHYROIDISM, continued

ABBREVIATIONS & DEFINITIONS

Autoimmune thyroid disease: a group of disorders that are caused by antibodies that get confused and attack the thyroid. These antibodies can either turn on the thyroid (Graves' disease, hyperthyroidism) or turn it off (Hashimoto's thyroiditis, hypothyroidism).

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

Levothyroxine (T₃): the major hormone produced by the thyroid gland and available in pill form as LevoxyI™, Synthroid™, Levotheroid™ and generic preparations.

Thyroid hormone therapy: patients with hypothyroidism are most often treated with Levothyroxine in order to return their thyroid hormone levels to normal. Replacement therapy means the goal is a TSH in the normal range and is the usual therapy. Suppressive therapy means that the goal is

a TSH below the normal range and is used in thyroid cancer patients to prevent growth of any remaining cancer cells.

Thyroxine (T₃): the major hormone produced by the thyroid gland. T₃ gets converted to the active hormone T₃ in various tissues in the body.

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.

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.

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