CLINICAL THYROIDOLOGY **FOR THE PUBLIC**

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HYPOTHYROIDISM

Thyroid hormone treatment of central hypothyroidism has a beneficial influence on cardiovascular risk factors

BACKGROUND

The hypothalamus (a region of the brain) and pituitary gland secrete hormones that regulate the function of thyroid gland, including thyroid hormone production. In addition to the thyroid gland, the hypothalamus and pituitary also control a number of other glands such as the adrenal gland, ovaries and testicles and are very important regulators of body growth. Hypothyroidism may be due to failure of the thyroid gland (primary hypothyroidism) or a lack of either a pituitary or hypothalamic hormone (central hypothyroidism). The vast majority of people with hypothyroidism have primary hypothyroidism, often due to Hashimoto's thyroiditis. Central hypothyroidism is much less common and is usually due to a tumor in the pituitary gland that disrupts its function and causes hypopituitarism. Hypopituitary patients may be deficient in one or more hormones, including thyroid hormone, growth hormone, cortisol, estrogen (women) or testosterone (men). Primary hypothyroidism has been associated with increased risk of cardiovascular disease. Since central hypothyroidism is relatively rare, few studies address the relationship between thyroid hormone replacement and cardiovascular risk in these patients. The aim of this study was to examine cardiovascular risk factors, such as body weight and cholesterol levels, in hypopituitary patients with central hypothyroidism.

THE FULL ARTICLE TITLE

Klose M et al. Central hypothyroidism and its replacement have a significant influence on cardiovascular risk factors in adult hypopituitary patients. J Clin Endocrinol Metab. 2013;98:3802-10. Epub June 24, 2013; doi: 10.1210/jc.2013-1610.

SUMMARY OF THE STUDY

This study examined the records of 209 hypopituitary patients cared for at a single referral hospital in Denmark. All were also growth hormone deficient and were starting growth hormone replacement therapy at the start of the study. Patients were examined at baseline and at approximately 4.1 years after starting growth hormone therapy. At baseline patients were determined to be either TSH sufficient (euthyroid) or TSH deficient (central hypothyroidism). Those with central hypothyroidism were further divided according to baseline Free T_4 levels. Patients with central hypothyroidism and the lowest Free T_4 levels had higher BMI, fat mass and waist circumference and a less favorable cholesterol profile than those who were euthyroid. At follow up, an increase in free T_4 was associated improvements in BMI, waist circumference and HDL cholesterol, even controlling for changes associated with growth hormone therapy.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Like patients with primary hypothyroidism, those with central hypothyroidism have an worsening of cardiovascular risk factors, such as cholesterol levels and BMI. These risk factors are improved by treatment with thyroid hormone. Doctors caring for patients with central hypothyroidism should try to optimize thyroid hormone replacement therapy in hopes of potentially reducing cardiovascular risk factors.

— Whitney Woodmansee, MD

ATA THYROID BROCHURE LINKS

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

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

ABBREVIATIONS & DEFINITIONS

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

HYPOTHYROIDISM, continued

Euthyroid: a condition where the thyroid gland as working normally and producing normal levels of thyroid hormone.

Hashimotos thyroiditis: the most common cause of hypothyroidism in the United States. It is caused by antibodies that attack the thyroid and destroy it.

Pituitary gland: this endocrine gland sits at the base of the brain and secretes hormones that control thyroid and adrenal function, growth and reproduction. The pituitary gland secretes TSH to control thyroid function.

Hypopituitarism: decrease in function of the pituitary gland. Hypopituitarism can be partial (affecting the secretion of 1 or more hormones) or complete (panhypopituitarism, lack of secretion of all of the pituitary hormones. The symptoms of hypopituitarism depend on the gland system affected.

Growth Hormone: secreted by the pituitary, growth hormone works to regulate growth, especially during the growth spurt during childhood. Growth hormone works through a growth factor call insulin-like growth factor 1 (IGF-1)

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.

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.