CLINICAL THYROIDOLOGY **FOR PATIENTS**

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AMERICAN THYROID ASSOCIATION
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HYPOTHYROIDISM

Hypothyroidism in patients with pituitary disease may be present even when the standard tests are normal

BACKGROUND

The pituitary gland produces hormones that regulate other endocrine glands, including the thyroid and adrenal glands. Patients who have pituitary tumors or damage to the pituitary from other causes may have hypothyroidism due to a loss of TSH secretion. In general, when the usual thyroid tests (T_4 and TSH) are in the normal range, it is assumed that thyroid function is normal and no thyroid hormone treatment is needed. However, this may not be true with impaired pituitary function. It is known that heart muscle function tests using echocardiography are typically abnormal in patients with the usual forms of hypothyroidism. The authors of this study used echocardiography to examine heart function in patients with pituitary disease who have T_4 and TSH levels in the normal range and who would normally not be considered for thyroid hormone treatment. The results were compared to studies done on patients with established hypothyroidism.

THE FULL ARTICLE TITLE

Doin FC et al Diagnosis of subclinical central hypothyroidism in patients with hypothalamic-pituitary disease by Doppler echocardiography. Eur J Endocrinol 2012;166:631-640.

SUMMARY OF THE STUDY

Heart function was studied by echocardiography in 20 patients with known hypothyroidism, 28 patients with no thyroid disease and 35 patients with pituitary disease with normal TSH levels. Of the patients with pituitary disease, 10 had low T_4 levels while the rest had normal T_4 levels. As expected, the echocardiography studies were abnormal in patients with hypothyroidism as compared to those with normal thyroid function. Echocardiography was also abnormal in the patients with pituitary disease and low T_4. Interestingly, echocardiography was also abnormal in 14 of the remaining 25 patients who had normal T_4 and TSH levels. All patients with abnormal echocardiographic studies were treated with thyroid hormone and the Free T_4 levels were increased to a high level within the normal range. This therapy returned the echocardiography studies to normal in the majority of these patients.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study suggests that some patients with pituitary disease and normal T_4 levels can be categorized as having mild central hypothyroidism. Further, these patients may have mild heart abnormalities which can be corrected with thyroid hormone therapy. It is unclear how to identify these patients and further studies need to be done to determine who will benefit from thyroid hormone therapy. Also, it is important that a complete investigation of all of the pituitary hormones be performed on all patients in whom thyroid hormone therapy is considered. Still, this is an important study for those individuals with pituitary disease.

— Jerrold M. Stock, MD

ATA THYROID BROCHURE LINKS

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

Thyroid Hormone Treatment: http://www.thyroid.org/thyroid-hormone-treatment

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.

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.

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HYPOTHYROIDISM, continued

Central hypothyroidism: a rare cause of hypothyroidism where the thyroid gland is normal and the problem is inadequate TSH secretion from the pituitary gland.

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.

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.

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_4): the major hormone secreted by the thyroid gland. Thyroxine is broken down to produce Triiodothyronine which causes most of the effects of the thyroid hormones.