



HYPOTHYROIDISM

What are the risk factors for the development of hypothyroidism?

WHAT IS THE STUDY ABOUT?

Hypothyroidism occurs when the thyroid gland is underactive and doesn't produce enough thyroid hormone. It is one of the most common endocrine disorders diagnosed and treated by endocrinologists and primary care physicians. Treatment decisions are based upon clinical symptoms supported by blood tests, specifically levels of TSH. The normal range of TSH plays a big role in the diagnosis of hypothyroidism. This is especially true for subclinical hypothyroidism when an increased TSH level is the only abnormality and the thyroid hormone levels are normal. It is somewhat controversial which patients with subclinical hypothyroidism will become clearly hypothyroid and should be treated with thyroid hormone replacement. This study is designed to determine which patient risk factors and blood tests can be used to predict the development of hypothyroidism and whether a change in the normal range for TSH is needed.

THE FULL ARTICLE TITLE:

Walsh et al. Thyrotropin and Thyroid Antibodies as Predictors of Hypothyroidism: A 13-Year Longitudinal Study of a Community-Based Cohort Using Current Immunoassay Techniques. *J Clin Endocrinology Metabolism*: March, 2010, Volume 95, Number 3, pp 1095-1104.

WHAT WAS THE AIM OF THE STUDY?

The aim of the study is to determine what are the risk factors for the future development of hypothyroidism.

WHO WAS STUDIED?

The study group included 1184 individuals in a small western Australian town (Busselton) who completed a survey and gave blood samples in 1981 and 1994, none of whom had been previously diagnosed with hypothyroidism.

HOW WAS THE STUDY DONE?

Participants completed a health survey and had blood drawn in 1981 and again in 1994. All blood samples were then tested for TSH, Free T₄ and TPO antibodies. TPO antibodies are used to diagnose autoimmune thyroid disease, which is the most common cause of hypothyroidism in the United States.

WHAT WERE THE RESULTS OF THE STUDY?

A total of 1110 individuals had a TSH <4 in 1981 (93.7%). In 1994, 110 of these individuals were either on thyroid hormone or had a TSH >4 (9.3%). In 1981, 11.1% of the individuals had positive thyroid antibodies. In 1994, 15.1% had positive thyroid antibodies. The main risk factors for developing hypothyroidism included: 1) being female, 2) having a TSH initially between 2.5-4 and 3) positive thyroid antibodies. Only 3% of individuals with an initial TSH < 2.5 and negative thyroid antibodies developed hypothyroidism over the 13 year period. In contrast, 55% of individuals with a TSH 2.5-4.0 and positive thyroid antibodies developed hypothyroidism. While most of the individuals with an initial TSH >4 in 1981 were hypothyroid in 1994, 14% had a TSH <4 without being treated.

HOW DOES THIS COMPARE WITH OTHER STUDIES?

Other studies have demonstrated the increased risk of developing hypothyroidism in the presence of positive thyroid antibodies and TSH > 2.0. Other studies also have reported that TSH rises with age without the development of hypothyroidism.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The presence of "high normal" TSH (2.5-4.0) with positive thyroid antibodies is a useful predictor of future hypothyroidism, especially in women. A patient with these lab results should be tested more frequently in order to diagnose and treat hypothyroidism before significant and prolonged symptoms develop.

— Jerrold Stock, MD

ATA THYROID BROCHURE LINKS

Hypothyroidism: http://thyroid.org/patients/patient_brochures/hypothyroidism.html

Thyroid Function Tests: http://thyroid.org/patients/patient_brochures/function_tests.html

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HYPOTHYROIDISM, 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.

Hashimoto's thyroiditis — the most common cause of hypothyroidism in the United States.

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.

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.

Thyroxine (T₄) — 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.



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