



EDITOR'S CHOICE — HYPOTHYROIDISM

Elevated cardiovascular risk factors in women with subclinical hypothyroidism are decreased by treatment with levothyroxine

WHAT IS THE STUDY ABOUT?

Hypothyroidism occurs when the thyroid gland is underactive and doesn't produce enough thyroid hormone. Women are about 10-times more likely to develop hypothyroidism than men. Hypothyroidism is diagnosed when the TSH level is increased and the thyroid hormone levels are low. A milder form of hypothyroidism, termed subclinical hypothyroidism, occurs when an increased TSH level is the only abnormality and the thyroid hormone levels are normal. It is somewhat controversial whether subclinical hypothyroidism should be treated with thyroid hormone replacement.

Thyroid hormone affects many organs in the body including the heart and kidney. Hypothyroidism has been associated with increasing several cardiovascular risk factors that lead to heart disease, including cholesterol, homocysteine levels and blood pressure. These cardiovascular risk factors lead to increased atherosclerosis (hardening of the arteries) that causes heart attacks. Atherosclerosis can also be examined by ultrasound measurements of the thickness of carotid artery walls and how flexible are the arteries. The thicker the carotid artery wall and less flexible the arteries are, the more atherosclerosis is present. This study examined cardiovascular risk factors and ultrasound measurements of atherosclerosis as well as kidney function in women with subclinical hypothyroidism before and following thyroid hormone replacement and compared the results to those obtained from women without hypothyroidism.

THE FULL ARTICLE TITLE:

Adrees M et al. Effects of 18 months of L-T₄ replacement in women with subclinical hypothyroidism. Clin Endocrinol (Oxf) 2009;71:298-303.

WHAT WAS THE AIM OF THE STUDY?

The aim of the study was to examine cardiovascular risk factors and kidney function in women with subclinical hypothyroidism before and after treatment with thyroid hormone in comparison to women without hypothyroidism.

WHO WAS STUDIED?

The study included 52 women (age 30-60 years) with subclinical hypothyroidism, defined by a persistently elevated TSH and normal Free T₄ blood levels for at least 6 months, and 52 women without hypothyroidism.

HOW WAS THE STUDY DONE?

The 52 women with subclinical hypothyroidism were evaluated for Cardiovascular risk factors before starting thyroid hormone and after 18 months of therapy. These results were compared to those obtained in 52 women without hypothyroidism of similar ages. Cardiovascular risk factors measured included blood pressure, cholesterol, homocysteine, and glomerular filtration rate (GFR - a measure of kidney function). In addition, 20 women with subclinical hypothyroidism underwent ultrasound testing that measured the thickness of the carotid artery walls and the flexibility of arteries.

WHAT WERE THE RESULTS OF THE STUDY?

As compared to women without hypothyroidism, women with subclinical hypothyroidism had significantly higher blood pressure, cholesterol and homocysteine and lower GFR. After 18 months of therapy with thyroid hormone, the blood pressure, cholesterol and homocysteine levels all decreased and the GFR increased to levels similar to those seen in women without hypothyroidism. In the subset of women with subclinical hypothyroidism who had the ultrasound measurements, the carotid artery wall decreased and the arteries were more flexible after 18 months of thyroid hormone therapy, indicating a decrease in atherosclerosis.

HOW DOES THIS COMPARE WITH OTHER STUDIES?

Numerous studies have linked subclinical hypothyroidism with a less favorable cardiovascular risk factors. Many studies have shown that cholesterol levels may decrease with thyroid hormone replacement therapy. However, the association of subclinical hypothyroidism with atherosclerosis is controversial. This study suggests that

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subclinical hypothyroidism is associated with increased atherosclerosis and that treatment with thyroid hormone may decrease atherosclerosis. Further studies are needed to assess whether treatment of subclinical hypothyroidism truly slows or reverses progression of atherosclerosis.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This is one of the first studies that indicate that treatment of subclinical hypothyroidism with thyroid hormone

could decrease atherosclerosis. However, further studies are needed before this can become part of regular clinical practice.

— Whitney Woodmansee, MD

ATA THYROID BROCHURE LINKS

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

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

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.

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.

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.

Atherosclerosis — “hardening of the arteries”, a condition wherein fatty material (cholesterol, lipids) collects along the inner walls of blood vessels (arteries). Over time, this material hardens (forms plaques) and can block blood flow through the arteries. Sometime the plaques can rupture and completely block blood flow through an artery – this is the main cause of heart attacks.