CLINICAL THYROIDOLOGY **FOR PATIENTS**

A publication of the American Thyroid Association

AMERICAN THYROID ASSOCIATION
FOUNDED 1923
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SUBCLINICAL HYPOTHYROIDISM

Reanalysis of the Whickham Survey shows an association of subclinical hypothyroidism and heart disease

WHAT IS THE STUDY ABOUT?

Hypothyroidism occurs when the thyroid gland is underactive and doesn't produce enough thyroid hormone. Subclinical hypothyroidism occurs when an increased TSH level is the only abnormality and the thyroid hormone levels are normal. Subclinical hypothyroidism has been associated with increasing several cardiac risk factors, including cholesterol, homocystine levels and blood pressure. It is unclear whether these changes are associated with an increased risk for heart disease in this group. Indeed, a study by Andrees that was summarized in the January issue (*Clinical Thyroidology for Patients* 3(1):3–4 Jan. 2010) suggested a decrease in heart disease if subclinical hypothyroidism is treated with thyroid hormone while a study by Boekholt in the February issue (*Clinical Thyroidology for Patients* 3(2): 5–6 Feb. 2010) suggested that subclinical hypothyroid has no risk for heart disease. One of the largest studies of thyroid problems in a population is the Wickham Survey, which studied the thyroid levels of adults living in the town of Wickham in England. Initially, the Wickham Survey did not find an association between thyroid disease and heart disease over a 20 year follow-up period. The current study looked at the Wickham Survey data more closely to examine the association between heart disease and death related specifically to subclinical hypothyroidism.

THE FULL ARTICLE TITLE:

Razvi et al. The incidence of ischemic heart disease and mortality in people with subclinical hypothyroidism: Reanalysis of the Whickham survey cohort. J. Clin. Endocrinol. Metab. 2010; 95:00-00 [Epub February 11, 2010].

WHAT WAS THE AIM OF THE STUDY?

The aim of the study was to examine the association between heart disease and death related specifically to subclinical hypothyroidism in the Whickham Survey.

WHO WAS STUDIED?

The Whickham Survey is a study of adults living in Wickham, an urban area in northern England. A randomly selected group of 2779 adults were first studied in 1972-1973 and have subsequently been followed for 20 years. For this re-analysis, the study group included a total of 2376 adults who had been followed for 20 years.

HOW WAS THE STUDY DONE?

The study group was divided into two groups based on their TSH level at the original entry into the Whickham survey. Subjects were considered to have normal thyroid function if their TSH was between 0.3 and 5.9 mIU/L and considered to have subclinical hypothyroidism if their TSH was between 6 and 15 mIU/L. The incidence of heart disease and death was determined in each group over the 20 year time of follow up.

WHAT WERE THE RESULTS OF THE STUDY?

Most of the participants in the study had a normal TSH (95.9%, average TSH 1.6) with only 4.1% having subclinical hypothyroidism (average TSH 13.2). There were more women than men in the study. Women with subclinical hypothyroidism had significantly higher baseline levels of blood pressure, cholesterol, LDL cholesterol ("bad" cholesterol), and homocysteine than women with normal thyroid function. Over the 20 years of follow-up, there were 165 deaths due to heart disease. The mortality rate of heart disease was higher in the individuals with subclinical hypothyroidism than in the individuals with normal thyroid function. Overall, there were 24 deaths in the group with subclinical hypothyroidism. Levothyroxine therapy was started in 20 of the 91 individuals with subclinical hypothyroidism. Mortality was significantly lower in the levothyroxine-treated group as compared with untreated individuals with subclinical hypothyroidism.

HOW DOES THIS COMPARE WITH OTHER STUDIES?

Numerous studies have linked subclinical hypothyroidism with increasing cardiac risk factors such as blood pressure, cholesterol and homocysteine and the current study supports these observations. Many studies have shown a decrease in these cardiac risk factors with thyroid hormone replacement therapy. However, the association between

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SUBCLINICAL HYPOTHYROIDISM, continued

subclinical hypothyroidism with heart disease and death remains unclear. This study is one of the few that shows a link between subclinical hypothyroidism and the risk for cardiac disease and death.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study suggests that there is an increased risk of cardiac disease and death in those with subclinical hypothyroidism. Further, this study suggests that thyroid hormone therapy may decrease this risk to that of an individual with normal thyroid function. While more studies need to be done to confirm these results, this study gives physicians more of a reason to treat individuals with thyroid hormone to restore their thyroid levels to the normal range.

— 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 where the only abnormal hormone level is an increased TSH.

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.

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.

Cardiac risk factors — these are factors that are associated with an increase risk of having heart disease. These include increased cholesterol, increased homocystine levels, high blood pressure, diabetes and smoking.