



## HYPOTHYROIDISM

### Subclinical hypothyroidism is a frequent finding in children and adolescents with type 1 diabetes

#### BACKGROUND

Subclinical hypothyroidism may represent the early stage of hypothyroidism, characterized by an increase in the TSH secretion from the pituitary gland in response to declining thyroid hormone levels within the normal range. The TSH will stimulate increased thyroid hormone release from the thyroid gland to maintain normal circulating T<sub>3</sub> and T<sub>4</sub> levels. In the adult population, subclinical hypothyroidism has a prevalence of 10% and has been associated with abnormal cholesterol profiles and increased risk of atherosclerosis and cardiovascular disease. A few small studies have reported a prevalence of subclinical hypothyroidism of 1% in children and adolescents. The prevalence of subclinical hypothyroidism in children with type 1 diabetes is not known. We know that type 1 diabetes by itself is associated with an increased risk for cardiovascular disease in adults. Therefore, early detection of other potentially modifiable cardiovascular risk factors associated with this disease is crucial. The aim of this study is to evaluate the prevalence of subclinical hypothyroidism in children, adolescents and young adults with type 1 diabetes and the potential association of subclinical hypothyroidism with an abnormal lipid profile in these groups.

#### THE FULL ARTICLE TITLE

Denzer C et al. Subclinical hypothyroidism and dyslipidemia in children and adolescents with type 1 diabetes mellitus. *Eur J Endocrinol*. February 5, 2013 [Epub ahead of print].

#### SUMMARY OF THE STUDY

A total of 22,747 patients from a large database for children and adolescents with type 1 diabetes established in Germany and Austria in 1995 were included in this study. All patients were younger than 25 years of age and had type 1 diabetes for more than 3 months. In

this study, 19.2% of the children and adolescents had either anti-TPO and/or antithyroglobulin antibodies and 7.2% had subclinical hypothyroidism. There was a stepwise increase in the total cholesterol and low-density lipoprotein (LDL) cholesterol levels with rising TSH levels, starting with TSH levels in the high normal range between 2-4 mU/L. A minimal increase in body-mass index and high-density lipoprotein cholesterol with increasing TSH levels was also found.

#### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

In this large study of young patients with type 1 diabetes, there was a high prevalence of subclinical hypothyroidism and even higher prevalence of thyroid antibodies when compared to individuals without type 1 diabetes. This study supports the recommendation that all patients with type 1 diabetes should be screened periodically for subclinical hypothyroidism. In addition, monitoring of patients with thyroid antibodies for development of hypothyroidism would be advisable. Finally, the association between an increase in LDL cholesterol with an increase in TSH suggest a reason to treat subclinical hypothyroidism in these young patients. However, further studies are needed to investigate whether treatment with thyroid hormone will improve the lipid profile and cardiovascular risk in these patients.

— Alina Gavrilă, 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.

**Subclinical 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

**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<sub>4</sub>)**: the major hormone produced by the thyroid gland. T<sub>4</sub> gets converted to the active hormone T<sub>3</sub> in various tissues in the body.

**Triiodothyronine (T<sub>3</sub>)**: the active thyroid hormone, usually produced from thyroxine.

**Anti-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.

**Anti-thyroglobulin 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.

**Type I Diabetes**: diabetes caused by antibodies that destroy the insulin producing cells of the pancreas. Patients with this form of diabetes require insulin to control their blood sugar.

**Low-density lipoprotein (LDL) cholesterol**: accumulates in the wall of the blood vessels resulting in atherosclerosis, also known as “bad cholesterol”.

**High-density lipoprotein (HDL) cholesterol**: protects against atherosclerosis and heart disease, also known as “good cholesterol”.