



## HYPOTHYROIDISM

### Hypothyroidism and risk for heart disease

#### BACKGROUND

Thyroid hormone has direct effects on heart function, blood vessels and cholesterol levels. In hypothyroidism, symptoms may include slowing of the heart rate, constriction of the blood vessels and increased blood pressure, retention of fluid and edema and an increase in cholesterol levels. Severe cases of hypothyroidism can cause heart failure and death. Hypothyroidism is treated with thyroid hormone replacement, which can reverse most of these negative effects. However, overtreatment of hypothyroidism can result in high thyroid levels and fast and irregular heart rates. There are a few clinical studies that have looked at the risk of heart problems in terms of duration of disease and treatment of hypothyroidism. This study investigated the risk of heart problems events in a large, well-characterized population in Denmark, focusing on the long term effects of undertreatment and overtreatment of hypothyroidism.

#### THE FULL ARTICLE TITLE

Lillevang-Johansen M et al 2019 Duration of over- and under-treatment of hypothyroidism is associated with increased cardiovascular risk. *Eur J Endocrinol* 180:407–416. PMID: 31035256.

#### SUMMARY OF THE STUDY

This study was done in Denmark in 216,894 patients with no known thyroid or heart disease at entry and who had at least one serum thyroid-stimulating hormone (TSH) level measured between 1995 and 2011. Data obtained from patient charts over a time period of 7 years was analyzed. The patients with thyroid disease were further divided into groups based on whether they had received treatment with levothyroxine and what their TSH levels were at the start of the study and later on.

Overall, 2680 individuals developed hypothyroidism – 622 had mild hypothyroidism (average TSH 5.5) and were not treated while 2058 individuals with an average TSH of 9.2 and were treated with levothyroxine. Individuals with mild hypothyroidism who were not treated had an 83% increased risk of developing heart problems as compared with individuals with normal thyroid function or hypothyroidism that was treated. Over a 5 years period as compared with individuals with normal thyroid function, individuals with mild hypothyroidism who were not treated had a 3-fold increased risk of developing heart problems, individuals with treated hypothyroidism with a low TSH had a 2.1-fold increased risk and treated individuals with a normal TSH had a 1.8-fold increased risk. The risk for heart problems was the highest in hypothyroid patients that were not treated when were >65 years of age.

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

This study showed that patients with hypothyroidism had an increased risk of developing heart problems as compared with patient with normal thyroid function whether they were treated or not, with the lowest risk in those patients treated achieving a normal TSH as compared to those with a low TSH or who were not treated. Thus, both under treatment and over treatment of hypothyroidism may be linked to a higher risk of heart disease. Further studies may be needed to clarify this link further.

—Vibhavasu Sharma, MD, FACE

#### ATA THYROID BROCHURE LINKS

Hypothyroidism (Underactive): <https://www.thyroid.org/hypothyroidism/>

Thyroid Hormone Treatment: <https://www.thyroid.org/thyroid-hormone-treatment/>





**HYPOTHYROIDISM, continued**

**ABBREVIATIONS & DEFINITIONS**

**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.

**Hypothyroidism:** a condition where the thyroid gland is underactive and doesn't produce enough thyroid hormone. Treatment requires taking thyroid hormone pills.

**Levothyroxine (T4):** the major hormone produced by the thyroid gland and available in pill form as Synthroid™, Levoxyl™, Tirosint™ and generic preparations.

**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.



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