



## HYPOTHYROIDISM

### Does the heart beat stronger with thyroid hormone treatment in older patients with mild hypothyroidism?

#### BACKGROUND

Hypothyroidism is a condition where the thyroid gland cannot make enough thyroid hormone. Since every system in our bodies uses thyroid hormone to function, having an underactive thyroid can create a large variety of symptoms. Overt hypothyroidism is diagnosed when the TSH is elevated and free T<sub>4</sub> is low while mild/subclinical hypothyroidism is diagnosed with a high TSH and a normal free T<sub>4</sub> level. TSH levels may naturally increase with age and a mildly elevated level may not cause any ill effect in older adults. Researchers have been interested in the effect of thyroid hormone on heart muscle for a long time. Some studies showed that patients over 65 years of age with untreated subclinical hypothyroidism who had TSH levels over 10 mIU/L had greater risk of heart failure. There is information from a few small studies that suggest treatment with thyroid hormone may strengthen the heart muscle, but this may be risky in older patients.

The TRUST trial (Multi-Modal Effects of Thyroid Replacement for Untreated Older Adults with Subclinical Hypothyroidism) was designed as the largest multicenter randomized controlled trial comparing thyroid hormone treatment with no treatment in patients over 65 with subclinical hypothyroidism. This method is the best way to study a research question. This is a study that is a smaller part of the TRUST trial and the aim of this study was to show the effect of thyroid hormone treatment on heart function in patients over 65 years with subclinical hypothyroidism.

#### THE FULL ARTICLE TITLE

Gencer B et al 2020 The impact of levothyroxine on cardiac function in older adults with mild subclinical hypothyroidism: A randomized clinical trial. *Am J Med.* Epub 2020 Mar 11. PMID: 32171774.

#### SUMMARY OF THE STUDY

The study was done in Switzerland. A total of 185 patients who were over 65 years old with an elevated TSH level and normal free T<sub>4</sub> levels were studied. Patients were given either levothyroxine (thyroid hormone) or placebo (a pill without a medication). A total of 96 patients with TSH levels above 4.6 mIU/L received levothyroxine; only 4 of these patients had a TSH level above 10 mIU/L. A total of 89 patients were in the placebo group. The levothyroxine starting dose was 25 mcg or 50 mcg. The dose was increased slowly until the TSH was normal. The researchers evaluated the heart muscle function, strength, and stiffness using echocardiography at the end of the study.

After 18 months of treatment TSH levels decreased into normal range with levothyroxine and remained elevated around 5.29 mIU/L with placebo. There was no difference in ejection fraction (how well the heart pumps blood with each beat) or in the measures of stiffness (how well the heart relaxes between beats) between the 2 groups.

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

Thyroid hormone treatment did not have any effect on heart function in patients with mild/subclinical hypothyroidism who were over 65 years old. This is the largest study assessing the effects of thyroid hormone treatment on heart function in this age group. Based on the results of this study, treatment of patients over 65 years old with very mild TSH elevation, especially if less than 10 mIU/L, can be avoided. This approach would mean one less medication to take and it would protect these patients from the risks of taking thyroid hormone.

— Ebru Sulanc, MD





## HYPOTHYROIDISM, continued

### ATA THYROID BROCHURE LINKS

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

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

### 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.

**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 (T4):** 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.

**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. Suppressive therapy means that the goal is a TSH below the normal range and is used in thyroid cancer patients to prevent growth of any remaining cancer cells.

**Heart failure:** A condition when the heart can't pump enough blood to meet the body's needs or cannot pump with enough force or cannot fill enough with blood.