



## HYPOTHYROIDISM

### TSH reference ranges should be used to safely guide thyroid hormone treatment in hypothyroid patients

#### BACKGROUND

Hypothyroidism is a very common condition, also called an underactive thyroid. It can happen due to damage to the thyroid gland from inflammation or after certain treatments like surgery. If it is not treated it can lead to other illnesses such as heart disease and may even be life threatening. It also causes symptoms like fatigue and weight gain. Patients with hypothyroidism need to take thyroid hormone which is often a lifelong treatment. Current guidelines recommend that the dose of the thyroid hormone should be adjusted to resolve the symptoms and to keep the TSH level within the range of 0.4 – 4 mIU/L. Although this range is considered normal, we do not know for sure whether variations within this range result in different health outcomes.

The aim of this study was to explore whether risk of death or illnesses like heart disease and broken bones were more common at certain TSH levels in patients who were treated for hypothyroidism.

#### THE FULL ARTICLE TITLE

Thayakaran R et al 2019 Thyroid replacement therapy, thyroid stimulating hormone concentrations, and long term health outcomes in patients with hypothyroidism: longitudinal study. *BMJ* 366:l4892. PMID: 31481394.

#### SUMMARY OF THE STUDY

The study was done in United Kingdom using a database called The Health Improvement Network. Adult patients who were diagnosed with hypothyroidism between

January 1, 1995 and December 31, 2017 were included in the study. The main outcomes were heart disease involving the blood vessels, heart failure, and stroke. Secondary outcomes were risk of death, irregular heart rhythm, and broken bones.

There were 162,369 patients in the 22-year study period. A total of 863,072 TSH measurements were analyzed. Risk of heart disease related to damage to blood vessels was higher when TSH level increased over 10 mIU/L. The risk of stroke was slightly less when TSH level was between 3-3.5 mIU/L and 4-10 mIU/L. Risk of death was higher when TSH level was lower than 0.1 mIU/L or especially above 10 mIU/L. Broken bones were more common at TSH levels above 10mIU/L, especially in women older than 65 years old.

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

This study shows that there was no evidence of negative outcomes when TSH levels were maintained in the recommended reference ranges in the guidelines (0.4 – 4 mIU/L). Conversely, the risk of heart disease, stroke, broken bones and death was higher in hypothyroid patients with TSH levels outside the recommended reference range. Importantly, this range offers flexibility in treatment since patients may feel better at different TSH levels and the findings of this study support that this is a safe range.

— Ebru Sulanc, MD

#### ATA THYROID BROCHURE LINKS

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





**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.

**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.

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



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