



HYPOTHYROIDISM

Is levothyroxine therapy overused?

BACKGROUND

Thyroxine is the main hormone secreted by the thyroid gland. Levothyroxine is the synthetic form of thyroxine and is one of the most commonly prescribed medications in the world. The main indication for levothyroxine is for the treatment of hypothyroidism. Other indications for levothyroxine include for decreasing the size of thyroid nodules or of goiter, although this indication has largely been shown to be ineffective. Levothyroxine also has been inappropriately used for treatment of problems that are not related to the thyroid.

Sometimes patients have been prescribed levothyroxine for a long time, but it is not clear why it was started or if they still need to be taking it. Also, while most patients with hypothyroidism require life-long treatment, in some patients the hypothyroidism may resolve. The main goal of this study was to determine how often such patients had normal thyroid hormone levels off levothyroxine treatment, suggesting that levothyroxine treatment was no longer needed. The authors also compared the features of individuals who ultimately had normal thyroid hormone levels off treatment, compared to those who had abnormal levels (high TSH or low free T₄) consistent with ongoing hypothyroidism.

THE FULL ARTICLE TITLE

Livadas S et al 2018 Levothyroxine replacement therapy and overuse: a timely diagnostic approach. *Thyroid*. Epub 2018 Oct 23. PMID: 30351232.

SUMMARY OF THE STUDY

The authors recruited 291 levothyroxine-treated patients from an academic Endocrinology clinic in Athens, Greece in 2015 and 2016. The patients were taking levothyroxine for more than a year and abnormal pre-treatment thyroid function studies were not clearly established in the medical record. All patients had normal thyroid hormone levels on levothyroxine treatment. The authors excluded individuals who had prior thyroid surgery, goiter (enlarged thyroid), patients who had abnormal thyroid hormone levels on L-T₄ treatment, individuals on medications that could

alter thyroid hormone levels (such as lithium, steroids), and women planning to get pregnant or who had given birth in the last year. The investigators also evaluated thyroid hormone levels (TSH, free T₄) before and after stopping levothyroxine treatment. All patients had a neck ultrasound to evaluate the appearance of the thyroid. Most of the patients were women (84%) and the average age was 48 years.

After stopping levothyroxine treatment for 6 to 8 weeks, 61% (177/291) of patients continued to have normal thyroid hormone levels. There was no significant difference in age, body mass index, duration of levothyroxine use, baseline thyroid hormone levels on levothyroxine (TSH, free T₄), levothyroxine dose, sex, family history of thyroid disease, or positivity of thyroid antibodies between patients who had normal thyroid hormone levels off levothyroxine compared to those whose levels became abnormal after pausing treatment. Irregular texture (heterogeneity) of the thyroid (an indication of inflammation in the thyroid) was seen more often in patients who had abnormal thyroid hormone levels off treatment (76%) compared to those whose levels remained normal (24%)

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The authors concluded that a substantial proportion of individuals taking levothyroxine in whom the original indication for treatment is unclear, may not need to be taking this hormone. The authors highlighted the importance of ensuring that the original diagnosis of hypothyroidism is fully evaluated and documented in medical records and that levothyroxine use be periodically re-evaluated in treated patients.

An important implication for patients newly prescribed levothyroxine is to make sure to understand the medical reason for the treatment. It is also important for levothyroxine-treated individuals to note that these findings may not be applied to patient groups that were excluded from the study (e.g. patients with thyroid surgery, women planning to get pregnant, and others). Moreover,





HYPOTHYROIDISM, continued

individuals in this study were carefully medically monitored, and it is not advisable for patients to stop thyroid medication on their own, without consulting a healthcare practitioner. Also, patients in whom levo-

thyroxine is discontinued still need to be followed to determine if they may eventually need to go back on levothyroxine at some point

— Anna Sawka, MD, PhD

ATA THYROID BROCHURE LINKS

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

Thyroid Function Tests: <https://www.thyroid.org/thyroid-function-tests/>

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.

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

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. T₄ gets converted to the active hormone T₃ in various tissues in the body.

Autoimmune thyroid disease: a group of disorders that are caused by antibodies that get confused and attack the thyroid. These antibodies can either turn on the thyroid (Graves' disease, hyperthyroidism) or turn it off (Hashimoto's thyroiditis, hypothyroidism).

Goiter: a thyroid gland that is enlarged for any reason is called a goiter. A goiter can be seen when the thyroid is overactive, underactive or functioning normally. If there are nodules in the goiter it is called a nodular goiter; if there is more than one nodule it is called a multinodular goiter.

Thyroid Ultrasound: a common imaging test used to evaluate the structure of the thyroid gland. Ultrasound uses soundwaves to create a picture of the structure of the thyroid gland and accurately identify and characterize nodules within the thyroid. Ultrasound is also frequently used to guide the needle into a nodule during a thyroid nodule biopsy.

