



## HYPOTHYROIDISM

### TSH needs to be monitored in patients treated with levothyroxine plus multiple other drugs

#### BACKGROUND

Hypothyroidism is a condition where the thyroid gland is underactive and doesn't produce enough thyroid hormone. Treatment is aimed toward replacing the main hormone of the thyroid, thyroxine. Levothyroxine is the main medication used to treat hypothyroidism. The levels of levothyroxine must be consistent for patients to experience benefits of treatment. Adequate thyroid hormone replacement in patients taking multiple medications is challenging, as several medications can interfere with levothyroxine. For example, some medications may decrease the absorption of levothyroxine from the gut and others slow down its metabolism. The goal of this study was to determine the extent of drug interactions in patients on long-term levothyroxine therapy.

#### THE FULL ARTICLE TITLE

Irving SA, Vadiveloo T, Leese GP. Drugs that interact with levothyroxine: an observational study from the thyroid epidemiology, audit and research study (TEARS). *Clin Endocrinol (Oxf)* 2015;82:136-141.

#### SUMMARY OF THE STUDY

In this study, the records of 10,999 patients 18 years old and over from Tayside, Scotland and were prescribed levothyroxine were reviewed before and after starting a medication reported to interfere with levothyroxine. A total 6,482 patients were included in the study. Drugs known to interfere with levothyroxine included iron, calcium, estrogen, proton pump inhibitors and H2 receptor antagonists (reflux medications), statins (cholesterol medications), anti-rheumatic drugs and gluco-

corticoids (steroid medications). Trends in the serum TSH a year before and 6 months following initiation of the interfering drug were recorded.

In patients treated with iron, proton pump inhibitors, calcium, and estrogens, an increase in serum TSH was observed; in some patients the TSH increase exceeded 5 mIU/L. Statins induced a significant decrease in serum TSH levels. Glucocorticoids, H2-receptor antagonists, or anti-rheumatic drugs had no effect on serum TSH.

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

This large study demonstrates the significant interaction between levothyroxine and iron, calcium, proton pump inhibitors, statins and estrogens. However, as millions of adults are treated with multiple medications including levothyroxine, it is important for endocrinologists to be aware of potential drug interactions that can affect the effectiveness of levothyroxine. Even though some changes in serum TSH may be small, it is essential for the treating physicians to closely monitor patients on multiple medications, as re-adjustments to the levothyroxine dose may be necessary.

— Maria Papaleontiou, MD

#### ATA THYROID BROCHURE LINKS

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

Hypothyroidism: <http://www.thyroid.org/what-is-hypothyroidism>

#### DEFINITIONS AND ABBREVIATIONS

**Levothyroxine (T<sub>4</sub>):** The major hormone produced by the thyroid gland and available in pill form as Synthroid™, Levoxyl™, Tirosint™ and generic preparations.

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

**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.

**Estrogen:** The main female hormone. Estrogen levels are increased during pregnancy.



## **HYPOTHYROIDISM, continued**

**Steroids/Glucocorticoids:** General anti-inflammatory and immunosuppressive drugs that are commonly used for the treatment of many autoimmune diseases associated with inflammation.

**Proton pump inhibitors:** A group of drugs whose main action is a pronounced and long-lasting reduction of gastric (stomach) acid production.

**H2 receptor antagonists:** A class of drugs used to block the action of histamine in the stomach, decreasing the production of acid.

**Statins:** A class of drugs used to lower cholesterol levels.

**Anti-rheumatic drugs:** A variety of medications used to treat several forms of inflammatory arthritis.

# Differentiated Thyroid Cancer

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