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HYPOTHYROIDISM

Levothyroxine treatment increases mortality in patients with heart failure

BACKGROUND

Hypothyroidism is a common condition that can affect the entire body and is treated with levothyroxine. It is clear that patients with overt hypothyroidism (high TSH and a low T_4) should be treated with levothyroxine. It is less clear if patients with mild hypothyroidism (high TSH, normal T_4) benefit from treatment. Finally, patients with thyroid abnormalities due to medical illnesses and not due to problems with the thyroid itself should not be treated.

In terms of heart function, it is well known that overt hypothyroidism has negative effects on the heart function that improve with levothyroxine treatment. However, studies of treating patients with subclinical (mild) hypothyroidism with heart problems have shown controversial results, with some studies suggesting that treating does not provide any benefit to the patient. This is especially true in patients with heart failure. While levothyroxine replacement may improve heart failure, it is possible that in this group it could have harmful effects, especially if the levothyroxine dose is too high. This Danish nationwide study evaluated the long-term effects of levothyroxine therapy in patients with heart failure.

THE FULL ARTICLE TITLE

Einfeldt MN 2018 Long-term outcome in heart failure patients treated with levothyroxine: an observational nationwide cohort study. J Clin Endocrinol Metab. Epub 2018 Dec 4. PMID: 30517746.

SUMMARY OF THE STUDY

This study used the Danish national registers to identify and collect clinical information for all Danish citizens >18 years of age who were diagnosed with heart failure during a hospital admission between 1997 and 2012. The patients who received levothyroxine treatment were identified from a nationwide database of all claimed prescriptions. The patients were divided in three groups: (1) patients already receiving levothyroxine at the time of the heart failure diagnosis, (2) patients who started levothyroxine treatment after being diagnosed with heart failure and (3) patients with heart failure not treated with levothyroxine. The study compared the overall death rate, the heart-specific death rate, the number of heart attacks and the combination of major adverse cardiovascular events (including death, heart attack, and stroke) between these patient groups.

A total of 224,670 patients with an average age of 71 years were diagnosed with heart failure; 209,103 of these patients did not receive levothyroxine, 6560 were already being treated with levothyroxine, and 9007 started levothyroxine treatment after the diagnosis of heart failure. Levothyroxine treatment started either before or after the diagnosis of heart failure was associated with an increased risk of death, both overall and due to heart problems, and major adverse cardiac events. The risk of having a heart attack was higher in patients who were already taking levothyroxine at the time of heart failure and lower in patients who started levothyroxine treatment after this diagnosis.

Information regarding the severity of the patients' heart disease before starting thyroid treatment, the severity of the hypothyroidism and whether the levothyroxine dose was adequate based on thyroid function test results measured on treatment was not available and was not included in the analysis.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study suggests that levothyroxine treatment in patients with heart failure results in an increase risk of death and adverse events. However, the results are severely limited by the lack of information of the presence of hypothyroidism as the reason for levothyroxine and by the lack of thyroid test results that would determine if the levothyroxine dose was appropriate. Certainly, until more definitive data is available, physicians need to use caution when prescribing levothyroxine for patients with heart failure. The reasons for treating must be clear and the patients need to be monitored closely to make sure that they take an adequate thyroid hormone dose.

— Alina Gavrila, MD, MMSC

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.

Overt Hypothyroidism: clear hypothyroidism an increased TSH and a decreased T_4 level. All patients with overt hypothyroidism are usually treated with 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.

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_4 gets converted to the active hormone T_3 in various tissues in the body.