



HYPERTHYROIDISM

Liver enzymes are commonly high in patients with untreated hyperthyroidism and improve after treatment of hyperthyroidism

BACKGROUND

Uncontrolled hyperthyroidism has widespread effects on most of the body's functions. Most of the body's functions return to normal with the thyroid hormone levels return to normal during treatment of the hyperthyroidism. One system affected by hyperthyroidism is the liver system, as the liver and thyroid are closely related. The liver makes proteins that bind and carry thyroid hormone in blood and helps the body break down thyroid hormone. When thyroid hormone levels are very high in hyperthyroidism, blood liver function tests can be also be increased to levels that suggest damage to the liver, even though severe liver problems from hyperthyroidism is extremely rare. These abnormal liver function tests return to normal when the hyperthyroidism is controlled and the thyroid hormone levels return to normal.

What can be confusing is that the medications used to control hyperthyroidism, the antithyroid drugs methimazole and propylthiouracil (PTU), both can cause increased liver function tests that may indicate liver damage. When this occurs, the antithyroid drugs should be stopped and alternative treatments (surgery, radioactive iodine therapy) need to be considered. Therefore, it may be difficult to start antithyroid drugs in a patient with hyperthyroidism when their liver function tests are also high.

This systematic review was done to evaluate how frequently elevated liver function tests are seen in patients with newly diagnosed and untreated hyperthyroidism.

THE FULL ARTICLE TITLE

Scappaticcio L et al 2020. Abnormal liver blood tests in patients with hyperthyroidism: Systematic review and meta-analysis. *Thyroid*. Epub 2020 Dec 16. PMID: 33327837.

SUMMARY OF THE STUDY

The authors evaluated combined results from 25 studies, each of which looked at liver function tests in at least 10 patients with newly diagnosed and untreated hyperthyroidism. They did not include any patients who had underlying liver disease or very severe hyperthyroidism. Patients in the study had hyperthyroidism from Graves' disease, toxic multinodular goiter, and toxic adenoma. Liver function tests measured in each study included alanine transaminase (ALT), aspartate transaminase (AST), alkaline phosphatase (ALP), total bilirubin (BIL), glutamyl transferase (GGT), prothrombin time, lactate dehydrogenase, and albumin.

A total of 6345 patients (age 19-77 years; 3061 females and 898 males) were included. Overall, 55% of patients had at least one abnormal liver function test at diagnosis. In patients with Graves' disease, 60% of patients had at least one liver function test at diagnosis. Frequency of abnormal levels of each liver function tests were 33% for ALT, 23% for AST, 44% for ALP, 12% for BIL, and 24% for GGT. Liver function tests improved in many patients after treatment of hyperthyroidism with antithyroid drugs and the return of thyroid hormone levels to normal. Frequency of normalization of each of abnormal liver function tests after treatment were 83% for ALT, 87% for AST, 53% for ALP, 50% for BIL, and 70% for GGT.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This systematic review showed that high blood liver function tests are common in patients with newly diagnosed and untreated hyperthyroidism. Frequency of having at least one abnormal liver function test in patients was 55%, much higher than 32% as reported in previous studies. In most cases, liver function tests were only mildly elevated, up to 5 times the normal range. However,





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high liver function tests became normal in most of these patients after they were treated with antithyroid drugs and thyroid hormone levels became normal.

The American Thyroid Association currently recommends checking baseline liver function tests in patients with newly diagnosed hyperthyroidism. These studies show

that antithyroid drugs can be safely used in patients with mild liver function test increases and will usually result in resolution of the liver abnormalities. However, these patients should be monitored carefully to make sure liver function tests improve with improvement of hyperthyroidism.

— Sun Y. Lee, MD

ATA THYROID BROCHURE LINKS

Hyperthyroidism (Overactive): <https://www.thyroid.org/hyperthyroidism/>

Graves' Disease: <https://www.thyroid.org/graves-disease/>

ABBREVIATIONS & DEFINITIONS

Thyrotoxicosis: a condition where thyroid hormone levels are elevated. It can be caused by either increased production of thyroid hormone from the thyroid gland, increased release of stored thyroid hormone from the thyroid gland, or taking too much of thyroid hormone.

Hyperthyroidism: a condition where the thyroid gland is overactive and produces too much thyroid hormone. Hyperthyroidism may be treated with antithyroid meds (Methimazole, Propylthiouracil), radioactive iodine or surgery.

Graves' disease: the most common cause of hyperthyroidism in the United States. It is caused by antibodies that attack the thyroid and turn it on.