



HYPERTHYROIDISM

Frequency of low white blood cells in hyperthyroidism and the response to hyperthyroidism treatment

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 such system affected is the immune system and the white blood cells that are involved in the immune response. The high levels of thyroid hormone can cause a decrease in the total count of one type of white blood cell known as neutrophils. Very low counts of neutrophils often increase the risk of getting a severe infection. As with the other systems, the low neutrophil counts return to normal once the thyroid hormone levels return to normal.

What can be confusing in treating patients with hyperthyroidism is that a very low neutrophil count, including an extreme form of low neutrophil count called agranulocytosis, is a rare but dangerous side effect of antithyroid drugs used to control hyperthyroidism. With methimazole, the risk of agranulocytosis is higher with a higher dose of the drug while there is no dose effect with propylthiouracil (PTU). If agranulocytosis 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 neutrophil count is already low.

This systematic review was done to evaluate how frequently low neutrophil counts are seen in patients with newly diagnosed and untreated hyperthyroidism.

THE FULL ARTICLE

Scappaticcio L 2020 Neutropenia in patients with hyperthyroidism: Systematic review and meta-analysis. Clin Endocrinol (Oxf). Epub 2020 Aug 16. PMID: 32799342.

SUMMARY OF THE STUDY

The authors reviewed over 1800 medical articles and of those, they included 13 studies in their analysis. Combining all 13 reports, they studied a total of 1144 patients with hyperthyroidism. Almost 90% of these patients had hyperthyroidism due to Graves' disease. Of these, 10% patients had neutropenia before receiving any treatment. The majority had mild to moderate neutropenia. In the 84 patients for whom the counts were measured, the low neutrophil counts resolved after receiving antithyroid treatment, which included antithyroid drugs and/or radioactive iodine therapy. It took about 2 to 8 weeks for the neutrophil count to return to normal. None of the patients developed severe neutropenia or agranulocytosis following antithyroid drug treatment.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This review shows that mild to moderate decreases in the neutrophil count is common in hyperthyroidism and almost always resolves after treatment of the hyperthyroidism. Further, patients with mild neutropenia are not at increased risk of developing severe neutropenia or agranulocytosis after starting antithyroid drugs.

The American Thyroid Association guidelines currently recommend checking baseline white blood cell counts in patients with newly diagnosed hyperthyroidism. These studies show that antithyroid drugs can be safely used in patients with mild to moderate decreases in the neutrophil count and will usually result in return of the neutrophil count to normal. However, as the guidelines also note a baseline moderate to severe neutropenia "should prompt serious reconsideration of initiating antithyroid drug therapy".

— Susana Ebner MD





HYPERTHYROIDISM, continued

ATA BROCHURE LINKS

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

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

ABBREVIATIONS & DEFINITIONS

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.

Methimazole: an antithyroid medication that blocks the thyroid from making thyroid hormone. Methimazole is used to treat hyperthyroidism, especially when it is caused by Graves' disease.

Propylthiouracil (PTU): an antithyroid medication that blocks the thyroid from making thyroid hormone. Propylthiouracil is used to treat hyperthyroidism, especially in women during pregnancy

White blood cells: blood cells involved with the immune response and fighting infections. Neutrophils, lymphocytes, eosinophils as basophils are all types of white blood cells.

Neutrophils: one of the white blood cells involved with the immune response and fighting infections.

Agranulocytosis: a marked decrease in the neutrophil cell count that causes a patient to be more likely to develop an infection. This is commonly associated with a fever and/or a sore throat.