



HYPERTHYROIDISM

Low white blood cell counts are common in patients with Graves' disease and improve with antithyroid drug treatment

BACKGROUND

Graves' disease is the most common type of hyperthyroidism in the United States. Antithyroid drugs (ATDs) are frequently used to treat Graves' disease. These drugs (Methimazole and Propylthiouracil in the United States, Carbimazole in Europe) are usually very well tolerated. However, agranulocytosis (low white blood cells) is a rare complication of ATDs occurring in 0.1-0.3% of patients. White blood cells (WBCs) help fight infections, so agranulocytosis can result in severe and even deadly infections. Graves' disease itself can cause mild decreases in WBCs that do not lead to infections, so it is important not to confuse this with agranulocytosis. The goal of this study is to evaluate how common low WBCs are seen in patients newly diagnosed with hyperthyroidism due to Graves' disease before starting ATD treatment and the effect of this treatment on the WBC count.

THE FULL ARTICLE TITLE

Aggarwal A et al. Treatment of hyperthyroidism with antithyroid drugs corrects mild neutropenia in Graves' disease. *Clin Endocrinol (Oxf)*. June 13, 2016 [Epub ahead of print]

SUMMARY OF THE STUDY

The study included 206 consecutive patients newly diagnosed with Graves' disease followed in an outpatient endocrinology clinic in Newcastle, United Kingdom between 2010 and 2014. Samples for complete blood count (CBC) that includes WBC counts were obtained prior to starting ATD treatment and then a few months later after the thyroid tests returned to normal on drug treatment. All patients started treatment with Carbimazole and about 10% of the patients were later switched to Propylthiouracil because of side effects from the carbimazole, including itching and joint pain. The majority of study participants were white (94.7%).

Mild low WBCs were found in 29 of the 206 (14%) study patients before starting ATD treatment. Interestingly, more than half of the 11 non-white patients (54.5%)

but only 11.8% of the white patients had a low WBCs at diagnosis. The patients who had baseline low WBCs had more severe hyperthyroidism and also had other low CBC tests such as low platelets and mild anemia. Interestingly, current smokers had a lower risk of having baseline low WBCs and had higher baseline CBC tests in general as compared with non-smokers.

The WBC count returned to normal in all patients with baseline low WBC count after starting ATD treatment. The WBC also increased in patients that had a normal WBC at baseline. In addition, platelet levels increased and anemia improved on ATD treatment. The time period required to normalize the thyroid function on ATD treatment and the ATD dose used were similar in patients with low and normal baseline WBC levels. None of the patients with a normal baseline WBC count developed a low count on ATD treatment. No study patient had agranulocytosis at baseline or developed this on treatment.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

A significant proportion of newly diagnosed patients with Graves' disease have a low baseline WBC count before starting ATD treatment, particularly non-white patients and patients with severe hyperthyroidism. The low WBC count and other blood abnormalities normalize once the thyroid function returns to normal on ATD treatment. The American Thyroid Association recommends performing a complete CBC, including WBC count before starting ATD treatment. It is important to diagnose a pre-existing low neutrophil count before starting treatment to differentiate it from the ATD-induced agranulocytosis, which can result in life-threatening infections and requires prompt ATD discontinuation.

— Alina Gavrila, MD, MMSC

ATA THYROID BROCHURE LINKS

Hyperthyroidism: <http://www.thyroid.org/hyperthyroidism/>

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


HYPERTHYROIDISM, continued
ABBREVIATIONS & DEFINITIONS

Hyperthyroidism: a condition where the thyroid gland is overactive and produces too much thyroid hormone. Hyperthyroidism may be treated with antithyroid medications (methimazole, carbimazole, 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.

Antithyroid drugs (ATDs): medications that block the thyroid from making thyroid hormone. Methimazole, carbimazole and propylthiouracil (PTU) are used to treat hyperthyroidism, especially when it is caused by Graves' disease.

Triiodothyronine (T₃): the active thyroid hormone. Thyroxine (T₄), the major hormone produced by the thyroid gland gets converted to the active hormone T₃ in various tissues in the body.

Complete blood count (CBC): test that analyzes the blood cells: red blood cells which carry oxygen, white blood cells which protect the body against infection and platelets which help with blood clotting.

Hemoglobin: the protein in red blood cells that binds oxygen to carry around to all the cells in the body. Hemoglobin levels are low with anemia.

Lymphocytes: type of white blood cells that are part of the immune system and produce antibodies to fight infection.

Neutrophils (WBCs): the most abundant type of white blood cells that fight infection by ingesting germs (micro-organisms) and releasing enzymes that kill germs.

Agranulocytosis: a marked decrease in the WBC 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.

Thyroid Awareness Monthly Campaigns

The ATA will be highlighting a distinct thyroid disorder each month and a portion of the sales for Bravelets™ will be donated to the ATA. The month of November is **Hyperthyroidism Awareness Month** and a bracelet is available through the ATA Marketplace to support thyroid cancer awareness and education related to thyroid disease.

