



ANTI-THYROID MEDICATION

WHAT IS THE STUDY ABOUT?

Methimazole is an antithyroid medication that blocks the thyroid from making thyroid hormone. It is used to treat hyperthyroidism. The most common cause of hyperthyroidism is Graves' disease, an autoimmune disease where the body makes antibodies that turn on the thyroid gland. Methimazole is usually a well-tolerated and safe drug, but on rare occasions, serious side effects can occur. The most serious side effect is called agranulocytosis, which may occur in 1 in 500 – 1000 patients. This is when the number of infection-fighting white blood cells in the blood decreases and cause the patient to be more likely to get an infection. The most common symptoms of this rare side effect are fever and/or a sore throat. For this reason, any patient on Methimazole is told to stop the drug and call their doctor should either of these symptoms occur. In the vast majority of patients with agranulocytosis, the white blood cell count returns to normal within 7–10 days. Some studies suggest that agranulocytosis is more likely to occur at higher rather than lower doses of Methimazole. This study attempts to see if agranulocytosis is more common in patients on 30 mg of Methimazole as compared to 15 mg of the drug.

THE FULL ARTICLE TITLE: Takata, K., Kubota S, Fukata S., Kudo T, Nishihara E, Ito M, Amino N, Miyauchi A. Methimazole-induced agranulocytosis in patients with Graves' disease is more frequent with an initial dose of 30 mg daily than with 15 mg daily. *Thyroid* 2009; 19: 559–63.

WHAT WAS THE AIM OF THE STUDY?

The aim of this study was to see if the rare side effect of agranulocytosis is more common in patients on 30 mg of Methimazole as compared to 15 mg of the drug.

WHO WAS STUDIED?

This study looked at 6,658 patients with Graves' disease treated with Methimazole at Kuma hospital in Japan between 1991–2005.

HOW WAS THE STUDY DONE?

The records of the study patients diagnosed with Graves' and treated with Methimazole were reviewed. If a patient developed a fever, Methimazole was discontinued and a white blood cell count was performed. Agranulocytosis was diagnosed if the white blood cell count was <1000 (normal range usually 5000–10,000).

WHAT WERE THE RESULTS OF THE STUDY?

In all, 28 of the 6,658 patients (0.4%) were diagnosed with agranulocytosis. A total of 17 patients of the 2087 on 30 mg of Methimazole developed agranulocytosis (0.8%). A total of 6 patients of the 2739 on 15 mg of Methimazole developed agranulocytosis (0.3%). Dividing the groups more broadly, a total of 22 of the 3174 patients (0.7%) treated with over 20 mg of Methimazole developed agranulocytosis as compared to 6 of the 3484 patients (0.2%) on less than 15 mg of Methimazole. No patient on less than 10 mg of Methimazole developed agranulocytosis.

HOW DOES THIS COMPARE WITH OTHER STUDIES?

There are few studies on this topic. However, those studies do show that agranulocytosis is related to the dose of methimazole.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Agranulocytosis is a very rare side effect of the antithyroid drug Methimazole which is commonly used to treat hyperthyroidism caused by Graves' disease. This rare side effect is more likely in patients treated with a daily dose of 30 mg than with 15 mg of Methimazole.

— Heather Hofflich, MD

ATA THYROID BROCHURE LINKS

Graves disease: http://thyroid.org/patients/patient_brochures/graves.html

Hyperthyroidism: http://thyroid.org/patients/patient_brochures/hyperthyroidism.html

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ANTI-THYROID MEDICATION, 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, Propylthiouracil), radioactive iodine or surgery.

Graves' disease: the most common cause of hyperthyroidism in the United States.

Agranulocytosis: a marked decrease in the white blood 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.

White blood cells: the infection-fighting cells of the blood.

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.