



GRAVES' DISEASE

Addition of selenium to methimazole does not alter the response to therapy in Graves' hyperthyroidism

BACKGROUND

The essential trace element selenium is necessary for the normal production and action of thyroid hormone. A deficiency of selenium, especially if accompanied by iodine deficiency, decreases the making of thyroid hormone and may decrease thyroid hormone levels. There is evidence that selenium may also be involved in affecting processes related to thyroid autoimmunity which causes both hypothyroidism and hyperthyroidism. Some studies, but not all, have shown that taking selenium reduces the production of thyroid antibodies, reduces postpartum thyroid problems and decreases permanent hypothyroidism.

A small trial done in Croatia showed that patients with Graves' disease who were given methimazole and selenium supplements took less time to normalize thyroid hormone levels. Another trial looked at selenium levels in patients with Graves' disease who discontinued methimazole. Although there were no significant differences, there was a trend for higher selenium levels in patients who were in remission. Other studies done on patients with Graves' disease and looking at symptoms (nervousness, tremor), reported inconsistent results when patient were given selenium supplementation.

The aim of this study was to determine whether selenium supplementation given to patients with Graves' disease who were starting treatment with methimazole resulted in improved response or remission rates.

THE FULL ARTICLE TITLE

Kahaly GJ et al. Double-blind, placebo-controlled, randomized trial of selenium in Graves hyperthyroidism. *J Clin Endocrinol Metab* 2017;102:4333-41.

SUMMARY OF THE STUDY

This trial was done in Germany and recruited 70 untreated patients with Graves' hyperthyroidism from an endocrinology clinic. All these patients had elevated thyroid hormone levels, suppressed TSH, elevated TSH receptor antibodies and evidence of increased thyroid blood flow on ultrasound.

These patients were assigned at random to methimazole, 10 or 20 mg depending on thyroid hormone level, with either selenium 300 mg daily or placebo. Patients were examined by one investigator who was not aware of the assignments. Selenium was continued until week 24, when it was discontinued. Methimazole doses were evaluated and adjusted at weeks 4, 12 and 24. Labs were drawn at weeks 4, 12 and 24. There were 35 patients in each group. As it is with thyroid disease, more than 75% of participants in each group were women, and both groups were similar in regards to other characteristics such as height, weight, smoking status or other autoimmune conditions.

At week 24, a total of 25 of 31 selenium-treated patients (80%) and 27 of 33 placebo-treated patients (82%) had normal thyroid hormone levels. At week 36, 11 of 23 selenium-treated patients (48%) and 12 of 27 placebo-treated patients (44%) had relapses of hyperthyroidism. The selenium level was not associated with response or relapse rate. Higher antibody levels at baseline were associated with a lower likelihood of response.

The conclusion of the study was that selenium supplementation did not improve the response rate to methimazole therapy in patients with Graves' hyperthyroidism.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The strength of this study is its design: randomized, placebo-controlled, and well balanced treatment groups. The weakness is the relative short duration, as prior studies have suggested 12-18 months to maximize the rates of remission. The baseline selenium level did not indicate that these patients were deficient, unlike the patients in the Croatian study, who were selenium-deficient.

Since the US population is not considered to be selenium-deficient, based on current data, selenium supplementation is not likely to improve response to methimazole or increase the rate of remission in patients with Graves' disease.

— Jessie Block-Galarza, MD





GRAVES' DISEASE, continued

ATA THYROID BROCHURE LINKS

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

ABBREVIATIONS & DEFINITIONS

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.

Selenium: a mineral found naturally in various foods that is important for making thyroid hormones and for normal thyroid function. It is needed in small amounts by the body.

Placebo: a pill with no biologic action that is used in clinical trials to determine if an active drug or compound is effective in treating or preventing a disease.

