



## GRAVES' DISEASE

# Serum TSH receptor antibodies fall gradually and only rarely switch functional activity in treated Graves' disease

### BACKGROUND

Graves' disease is the most common cause of hyperthyroidism in the United States. It can be treated with either antithyroid drugs, surgery or radioactive iodine. Graves' disease happens when the immune system of an individual makes specialized proteins called antibodies, which circulate in the blood then attach to the thyroid gland at a place called the TSH receptor. These TSH receptor antibodies then stimulate the thyroid to make excess amounts of thyroid hormone. Testing for these antibodies in patients with Graves' disease is very helpful to make a diagnosis.

A decrease in the level of TSH receptor antibodies during treatment with antithyroid medications can help determine the chances of the Graves' disease going into remission. Interestingly, the level TSH receptor antibodies present in an individual falls over time regardless of the type of treatment used. In addition, some of the TSH receptor antibodies may switch function and will either stop stimulating the thyroid or even inhibiting the thyroid.

The purpose of this study was to gain information regarding the trend of the levels of the TSH receptor antibodies over time and also understand whether the function of those antibodies changes contributing to remission after treatments with antithyroid medications.

### THE FULL ARTICLE TITLE

Nalla P et al 2019 Thyrotropin receptor antibody concentration and activity several years after treatment for Graves' disease. *Clin Endocrinol (Oxf)* 90:369–374.

Summary of the study

This study was done recruiting 66 patients with Graves disease who had elevated serum TSH receptor antibodies at diagnosis. They were recruited at least one year after any treatment. The average age was 59 years (range 29-85) and 85% were women. A total of 6 patients were still taking antithyroid medications long term; 20 patients were in remission after stopping the medication; 27 had received radioactive iodine and 13 patients had thyroid surgery. All

patients had blood work showing stable thyroid hormone levels. The average follow up duration was 6-7 years for all patients. The researchers used tests that measure not just the presence and amount of antibodies, but also the effect of those antibodies on thyroid cells (stimulation, inhibition or neutral).

One year after diagnosis, TSH receptor antibody levels were detectable in 30 patients (45%) and 5 years after diagnosis, 15 (23%) still had detectable antibody levels. In all groups, the overall levels were lower on follow up than at diagnosis. However, the patients who had surgery had the greatest decreases and the patients who had radioactive iodine had the least decreases.

When looking at the functional activity of the antibodies in patients who still had detectable levels, the majority was of a stimulating type with only one patient had antibodies of the inhibitory type.

### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The results of this study suggest that a change in the function of the thyroid antibodies from stimulating to inhibiting is not likely to be contributing to remission in patients who elect to take antithyroid medications to treat Graves' disease. Although surgery seems to be the type of treatment that leads to the furthest reduction in antibody levels, the choice of treatment for patients should be individualized, taking into account patients preference, desire for future pregnancies, availability of experienced surgeons and clinical factors such as the presence of Graves' eye disease.

This study is limited because it included a small amount of patients, and does not provide answers for example to the question whether the patients who still had stimulating antibodies present after years are more likely to recur. Thus, additional studies are needed to confirm these findings.

— Jessie Block-Galarza, MD





## GRAVES' DISEASE, continued

### ATA THYROID BROCHURE LINKS

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

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. Graves' disease may be treated with antithyroid meds, radioactive iodine or surgery

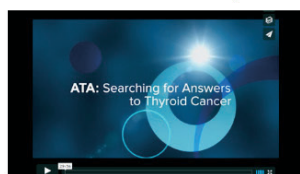
**Antibodies:** proteins that are produced by the body's immune cells that attack and destroy bacteria and viruses that cause infections. Occasionally the antibodies get confused and attack the body's own tissues, causing autoimmune disease.

**TSH receptor antibodies (TRAB):** antibodies often present in the serum of patients with Graves' disease that are directed against the TSH receptor, often causing stimulation of this receptor with resulting hyperthyroidism.

**Radioactive iodine (RAI):** this plays a valuable role in diagnosing and treating thyroid problems since it is taken up only by the thyroid gland. I-131 is the destructive form used to destroy thyroid tissue in the treatment of thyroid cancer and with an overactive thyroid.

**Thyroidectomy:** surgery to remove the entire thyroid gland. When the entire thyroid is removed it is termed a *total thyroidectomy*. When less is removed, such as in removal of a lobe, it is termed a *partial thyroidectomy*.

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