



## GRAVES' DISEASE

# Steroids are effective for preventing thyroid eye disease after radioactive iodine therapy in patients with Graves' disease for less than 5 years

### BACKGROUND

Thyroid eye disease, also known as Graves' orbitopathy, is most often seen in association with Graves' disease. The eye disease includes inflammation of the eyes, eye muscles and the surrounding tissues and produces symptoms of dry eyes, red eyes, bulging of the eyes and double vision. Most patients with thyroid eye disease have minimal or no symptoms but ~10% have significant disease that requires treatment. Unfortunately, thyroid eye disease remains very difficult to treat.

Graves' disease, the most common cause of hyperthyroidism in the United States, can be treated with antithyroid drugs, radioactive iodine therapy or surgery. Radioactive iodine therapy can make thyroid eye disease worse, with increased risk in patients with pre-existing significant eye symptoms and those who smoke, have severe hyperthyroidism or high serum TSH-receptor antibody levels (the cause of Graves' disease). After radioactive iodine therapy, eye disease can worsen if the resulting hypothyroidism is not corrected promptly after the treatment. Some studies suggest that worsening of thyroid eye disease after radioactive iodine therapy may be prevented by high dose oral steroids.

Prior studies have also showed that patients with Graves' disease for less than 5 years have a higher risk to develop thyroid eye disease after radioactive iodine therapy. The goal of this study was to assess whether steroid therapy at the time of the radioactive iodine therapy prevents the development of thyroid eye disease in patients with Graves' disease for less than 5 years who do not have active eye disease.

### THE FULL ARTICLE TITLE

Vannucchi G et al 2019 Prevention of orbitopathy by oral or intravenous steroid prophylaxis in short duration Graves' disease patients undergoing radioiodine ablation: A prospective randomized control trial study. *Thyroid* 29:1828–1833. PMID: 31860407.

### SUMMARY OF THE STUDY

The study included patients with Graves' disease without clinical thyroid eye disease (20%) or with preexisting but inactive thyroid eye disease (80%) who received radioactive iodine therapy for relapsing hyperthyroidism after discontinuing antithyroid drug therapy. All patients received a fixed radioactive iodine dose of 600 MBq (16 mCi). A total of 121 patients with Graves' disease for less than 5 years were randomly assigned to start oral or intravenous (IV) steroid treatment at the time of radioactive iodine therapy for the prevention of thyroid eye disease development or reactivation. The oral steroid group received a starting dose of 35 mg/day of prednisone that was tapered off over 10 weeks, while the IV steroid group received weekly methylprednisolone for 4 weeks (500 mg/week for 2 weeks, then 250 mg/week for 2 more weeks). A second group of 22 patients who had Graves' disease for more than 5 years and did not receive preventive steroid therapy represented the control group. The patients were followed in the clinic for up to 5 years after the radioactive iodine therapy.

In the preventive steroid group, none of the patients developed new thyroid eye disease or had thyroid eye disease reactivation within 6 months after the radioactive iodine therapy. Oral and IV steroid treatment had the same effect in preventing thyroid eye disease. Two patients with preexisting thyroid eye disease (1 patient received oral steroid and 1 patient received IV steroid treatment) reactivated at 12 and 20 months, respectively; the reactivation was thought to be related to the natural course of the disease rather than the radioactive iodine therapy itself. In the control group, none of the patients developed new thyroid eye disease, and only 1 patient had thyroid eye disease reactivation 3 months after the radioactive iodine therapy. This patient developed severe hypothyroidism at that time, and the thyroid eye disease improved when thyroid levels normalized on thyroid hormone treatment.



## GRAVES' DISEASE, continued

More than 80% of the patients who answered the side-effects questionnaire reported symptoms possibly related to steroid therapy (weight gain, dyspepsia, fatigue, mood disorder, etc.); those treated with oral steroids were more likely to develop symptoms as compared with those who received IV steroids.

Serum TRAb levels, the cause of Graves' disease and which are thought to play a major role in development of thyroid eye disease, increased as expected in all groups after the radioactive iodine therapy; however, it showed a delayed rise in steroid-treated patients with a peak at 6 months instead of 3 months in patients who did not receive this treatment. The duration of Graves' disease, serum TRAb titers, and steroid use did not affect the effectiveness of the radioactive iodine therapy in treating the hyperthyroidism.

## WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study suggests that steroid treatment can prevent thyroid eye disease induced by radioactive iodine therapy in patients with Graves' disease for less than 5 years. Steroid therapy might not be necessary in patients who had Graves' disease for more than 5 years, since their risk of new or reactivated thyroid eye disease related to the radioactive iodine therapy is extremely low. The known increase in serum TRAb levels following radioactive iodine therapy is delayed by steroid treatment, which likely plays a role in the thyroid eye disease benefit noted from this treatment.

—Alina Gavrilă, MD, MMSC

### ATA THYROID BROCHURE LINKS

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

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

Radioactive Iodine Therapy: <https://www.thyroid.org/radioactive-iodine/>

### 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 an autoimmune disease caused by antibodies (TRAb) that attack the thyroid and turn it on.

**TRAb:** antibodies often present in the serum of patients with Graves' disease that are directed against the TSH receptor located on the thyroid cell surface. Stimulation of this receptor by TRAb

results in increased thyroid hormone production within the thyroid cells and hyperthyroidism.

**Thyroid eye disease (TED)/Graves' orbitopathy (GO):** is most often seen in patients with Graves' disease but also can be seen with Hashimoto's thyroiditis. GO includes inflammation of the eyes, eye muscles and the surrounding tissues. Symptoms include dry eyes, red eyes, bulging of the eyes and double vision.

**Antithyroid drugs (ATDs):** medications that block the thyroid from making thyroid hormone and are used to treat hyperthyroidism (methimazole, propylthiouracil).





## GRAVES' DISEASE, continued

**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 hyperthyroidism.

**Hypothyroidism:** a condition where the thyroid gland is underactive and doesn't produce enough thyroid hormone. Radioactive iodine treatment for hyperthyroidism usually results in hypothyroidism. Treatment requires taking thyroid hormone pills.

**Steroids/Glucocorticoids:** general anti-inflammatory and immunosuppressive drugs that are commonly used for the treatment of many autoimmune diseases associated with inflammation.

