



## GRAVES' DISEASE

# Which factors predict the outcome of radioactive iodine therapy of Graves' Disease?

### BACKGROUND

Graves' disease is the most common cause of hyperthyroidism in the United States. Graves' disease can be treated with medication (anti-thyroid drugs), surgery or radioactive iodine therapy. While the idealistic aim for treatment is to leave the patient with normal thyroid function long term, this is difficult to attain. In Europe and Asia, anti-thyroid drugs are frequently used as a first choice treatment. However, many patients will have a relapse of their hyperthyroidism after a course of anti-thyroid drugs. Because of this, in the US, many patients are treated with a goal of destroying the thyroid with radioactive iodine therapy, leaving the patient with stable hypothyroidism and using thyroid hormone as a replacement. Radioactive iodine therapy has become less popular recently with more patients started on anti-thyroid drugs. Since many people still feel that radioactive iodine therapy is a good treatment for hyperthyroidism, this study was done to review the response to radioactive iodine therapy as an initial treatment for Graves' disease, including its' usefulness and side effects.

### THE FULL ARTICLE TITLE

Aung ET et al. Predicting outcomes and complications following radioiodine therapy in Graves' thyrotoxicosis. *Clin Endocrinol (Oxf)*. Epub 2018 Oct 6. PMID: 30291728.

### SUMMARY OF THE STUDY

This study reviewed the records of 576 patients with Graves' disease who received a total of 665 radioactive iodine therapy treatments over a 10 year period at the Edinburgh Centre of Endocrinology and Diabetes. Not surprisingly 75% of the patients were women, with an average age of 51. The group studied received their first dose of radioactive iodine therapy within 6 months of the diagnosis of Graves' disease, although 12% required a second dose and 1% a third dose to cure their hyperthyroidism. Patients were treated with 10 mCi of radioactive iodine for the first dose but often received a higher dose for second or third doses. Nearly

half of the patients received radioactive iodine therapy as their only treatment, while the remainder received anti-thyroid drugs either before, after or both receiving radioactive iodine therapy. A total of 45 patients had Graves' eye disease and about half of these were treated with glucocorticoids, a medication that can help prevent any worsening of the eye disease. Thyroid hormone levels were monitored within 8 weeks after radioactive iodine therapy and then every 1-2 mo after.

The outcomes studied were treatment failure – meaning that hyperthyroidism persisted and a patient required another dose of radioactive iodine therapy or anti-thyroid drugs, weight change at 1 year after successful treatment, the presence or development of Graves' eye disease, and patient satisfaction. Outcomes were determined at 1 year after the first dose of radioactive iodine therapy and at a mean follow up of 6.7 years.

At one year after the first dose of radioactive iodine therapy, 76.6% of patients were hypothyroid, 17% remained hyperthyroid and 5.7% had normal thyroid function. After 6.7 years an additional 11% were hypothyroid after 2 or 3 doses. Patients who remained hyperthyroid were either receiving anti-thyroid drugs (2.3%) or had thyroid surgery (0.9%).

They found that patients who had higher thyroid hormone levels, higher levels of a specific antibody associated with Graves' disease (TRAB) or were treated with anti-thyroid drugs after their dose of radioactive iodine therapy were more likely to fail their first dose of radioactive iodine therapy. But failure was not associated with other features such as age, sex, smoking. Weight change was analyzed in only 228 patients and 84% gained weight by 1 year after radioactive iodine therapy. This seemed to be dependent on thyroid hormone levels before radioactive iodine therapy and the absence of anti-thyroid drug treatment prior to radioactive iodine therapy, but was not clearly related to thyroid hormone levels after treatment. New eye disease developed in





## GRAVES' DISEASE, continued

45 patients after radioactive iodine therapy. Of these, 13 patients required treatment with glucocorticoid, 4 needed radiation to the orbits and 6 required surgery. Higher thyroid hormone levels prior to radioactive iodine therapy treatment were associated with the development of new eye disease although increased levels of TRAB was not. While smoking was associated with the presence of eye disease prior to radioactive iodine therapy, it did not seem to be associated with development of eye disease after radioactive iodine therapy. Only 175 patients responded to a questionnaire regarding patient satisfaction. Most were satisfied about receiving radioactive iodine therapy and about their well being in the year after radioactive iodine therapy. Overall, 79% said they would recommend to a friend although 53% were unhappy about their weight gain.

## WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This was a large study of patients who received radioactive iodine therapy for Graves' disease and showed an overall favorable prognosis. While some patients will require more than one dose of radioactive iodine, by the end of the study over 97% were adequately treated by radioactive iodine therapy. Weight gain is common, but in this study was not measured against patients' normal weight prior to the development of hyperthyroidism, which has previously been shown to be associated with weight gain after treatment. It appears there was little effect of radioactive iodine therapy on pre-existing Graves' eye disease, although some will develop eye disease after radioactive iodine therapy. A majority of patients were satisfied with their treatment.

— Marjorie Safran, MD, FACE

### ATA THYROID BROCHURE LINKS

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

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

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

Thyroid and Weight: <https://www.thyroid.org/thyroid-and-weight/>

### 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.

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

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

**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.

