



## HYPERTHYROIDISM

# Treatment of hyperthyroidism with larger doses of radioactive iodine produces a higher success rate

### BACKGROUND

Graves' disease is the most common cause of hyperthyroidism. Radioactive iodine treatment is a frequently used treatment option for hyperthyroidism due to Graves' disease. As a definitive therapy, radioactive iodine treats hyperthyroidism by destroying the thyroid gland. It is difficult, however, to determine the best radioactive iodine dose needed for an individual patient that will result in a normal thyroid function. A large radioactive iodine dose will destroy too much thyroid tissue resulting in hypothyroidism, while a low radioactive iodine dose will not destroy enough thyroid tissue and the patient will remain hyperthyroid. Since we cannot calculate the exact radioactive iodine dose that will result in normal thyroid function, achieving a hypothyroid state is the preferred outcome at present. This study compares the time needed to correct the hyperthyroidism and the success rate of different radioactive iodine doses.

### THE FULL ARTICLE TITLE

Sztal-Mazer S et al Evidence for higher success rates and successful treatment earlier in Graves' disease with higher radioactive iodine doses. *Thyroid* 2012;22:991-5. doi: 10.1089/thy.2011.0362. Epub September 6, 2012.

### SUMMARY OF THE STUDY

The study included 258 patients with Graves' disease who received radioactive iodine treatment and had adequate follow up between 1994 and 2009 at a thyroid center in Brazil. The patients group consisted of 85.6% women and the average age was 38.6 years. The average radioactive iodine dose was 21.4 mCi, with a range between 6 and 29.9 mCi. The patients were divided into three groups based on the RAI dose received: I (<15 mCi), II (16 to 20 mCi) and III (>21 mCi). There were 61 patients in group I, 95 in group II, and 97 in group III. The treatment was

considered successful if after a single dose of radioactive iodine, the patients either became hypothyroid or became euthyroid off all antithyroid drugs. The success rate was 73.7% in group I, 84.9% in group II and 89.0% in group III. The average time to achieve hypothyroidism or euthyroidism after the radioactive iodine treatment was 8.1, 4.6 and 2.9 months, respectively.

### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study shows that the number of patients with Graves' disease who become hypothyroid or euthyroid after receiving radioactive iodine treatment is higher and the time period to achieve a hypothyroid or euthyroid state is shorter with higher radioactive iodine doses. The radioactive iodine doses used in this study are higher than the doses of 10-15 mCi that are recommended in the recent guidelines published by the American Thyroid Association. This study does not address possible side effects from the radioactive iodine treatment, which are related to the radiation dose. One should take into account the cost of lifelong therapy with thyroid hormone for patients who become hypothyroid after the radioactive treatment.

— Alina Gavrilă, MD

### ATA THYROID BROCHURE LINKS

Hyperthyroidism: <http://www.thyroid.org/what-is-hyperthyroidism>

Graves' disease: <http://www.thyroid.org/what-is-graves-disease>

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

Hypothyroidism: <http://www.thyroid.org/what-is-hypothyroidism>

### ABBREVIATIONS & DEFINITIONS

**Euthyroidism:** a condition where the thyroid gland is working normally and producing normal levels of thyroid hormone.

**Hypothyroidism:** a condition where the thyroid gland is underactive and does not produce enough thyroid hormone. Treatment requires taking thyroid hormone pills.

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## **HYPERTHYROIDISM**, continued

**Hyperthyroidism:** a condition where the thyroid gland is overactive and produces too much thyroid hormone. Hyperthyroidism may be treated with antithyroid medications medication that block the thyroid from making thyroid hormone (Methimazole, Propylthiouracil), radioactive iodine that destroys the thyroid gland or surgery.

**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.

**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. I-123 is the non-destructive form that does not damage the thyroid and is used in scans to take pictures of the thyroid (Thyroid Scan) or to take pictures of the whole body to look for thyroid cancer (Whole Body Scan).

**mCi:** millicurie, the units used for I-131.