



## HYPERTHYROIDISM

### Choosing the dose of radioactive iodine that cures hyperthyroidism without causing hypothyroidism

#### BACKGROUND

Graves' disease is the most common type of hyperthyroidism in the United States. While hyperthyroidism may be treated with antithyroid meds, radioactive iodine or surgery, radioactive iodine is eventually used in ~85% of patients in the United States. Radioactive iodine works by being taken up into the overactive thyroid and destroying the gland. Most of the time, this results in permanent hypothyroidism. Indeed, this is often the goal of treatment. The goal of this study was determine a method to choose a dose of radioactive iodine that would cure the hyperthyroidism without causing hypothyroidism.

#### THE FULL ARTICLE TITLE:

Chen DY et al Striving for euthyroidism in radioiodine therapy of Graves' disease: a 12-year prospective, randomized, open-label blinded end point study. *Thyroid* 2011;21:647-54. Epub May 12, 2011.

#### SUMMARY OF THE STUDY

A total of 529 patients who had Graves' disease participated in this study from China. The patients were randomly assigned to one of five groups that received different doses of radioactive iodine based on the size of the thyroid and the 24-hour radioactive iodine thyroid uptake. The dose was also adjusted based on a scoring system for six clinical factors, including gland texture, duration of disease, previous use of antithyroid drugs, severity of disease, complications and age. Gland weight was estimated by ultrasound.

The average age of the patients was ~35 years, three fourths were women, the average gland was 2–3-fold enlarged and the average 24-hour radioactive iodine thyroid uptake was about 65%. Using the clinical scoring system to determine the dose of radioactive iodine given, the hyperthyroidism was successfully treated initially in 94% of patients. Only 22% became hypothyroid, but 14% had recurrences of their hyperthyroidism during the 12-year follow-up.

#### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This is an important study for patients with Graves' disease, since it allows for an increased likelihood that life-long medical therapy will not be needed. The trade-off for less hypothyroidism after a radioactive treatment is an increase in either inadequate treatment or a relapse of the hyperthyroidism, both of which may require a second treatment with radioactive iodine. In this study, ~20% had either persistence or a relapse of the hyperthyroidism, about the same amount of patients that had permanent hypothyroidism. Further studies are needed in the United States before this method can be recommended to patients.

— Alan P. Farwell, MD

#### ATA THYROID BROCHURE LINKS

Hyperthyroidism: [http://thyroid.org/patients/patient\\_brochures/hyperthyroidism.html](http://thyroid.org/patients/patient_brochures/hyperthyroidism.html)

Graves' disease: [http://thyroid.org/patients/patient\\_brochures/graves.html](http://thyroid.org/patients/patient_brochures/graves.html)

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## **HYPERTHYROIDISM**, continued

### **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 caused by antibodies that attack the thyroid and turn it on.

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

**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).

**Radioactive iodine uptake (RAIU):** this is a measurement of activity of the thyroid gland and is reported as the percent of a dose of radioactive iodine that is retained in the thyroid gland 24 h after the dose is given. An increase in RAIU usually indicates hyperthyroidism.

**Thyroid Ultrasound:** a common imaging test used to evaluate the structure of the thyroid gland. Ultrasound uses soundwaves to create a picture of the structure of the thyroid gland and accurately identify and characterize nodules within the thyroid. Ultrasound is also frequently used to guide the needle into a nodule during a thyroid nodule biopsy.