



HYPERTHYROIDISM

Fixed-dose radioactive iodine therapy reduces goiter size and treats hyperthyroidism in most patients with toxic multinodular goiter

BACKGROUND

The 2 most common causes of hyperthyroidism are Graves' disease and toxic multinodular goiter. Graves' disease is an autoimmune disorder while toxic multinodular goiter (TMNG) results from thyroid enlargements forming lumps that make too much thyroid hormone and become overactive. Toxic multinodular goiter is common in the elderly and in areas of the world with low iodine in their diet. Definitive treatment for both causes of hyperthyroidism includes radioactive iodine therapy and surgery. Radioactive iodine is taken up into the thyroid gland and works by damaging the thyroid cells causing a decrease in the production of thyroid hormones and, eventually, a decrease in the size of the thyroid. Radioactive iodine therapy is better tolerated in older people who have additional medical problems that result in an increased surgical risk. Additionally, it is less expensive. However, it can take some months until the patients' thyroid levels normalize after the treatment. The size of the thyroid usually decreases after the treatment.

The best dose of radioactive iodine to treat Graves' disease can be calculated using the radioactive iodine uptake, since the entire thyroid is overactive. It is more challenging to determine the best dose of radioactive iodine to treat a toxic multinodular goiter since only parts of the thyroid are overactive. This study examines the effect of treating patients with toxic multinodular goiter with a fixed dose of radioactive iodine.

THE FULL ARTICLE

Roque C et al 2020 Long-term effects of radioiodine in toxic multinodular goitre: Thyroid volume, function and autoimmunity. *J Clin Endocrinol Metab*. Epub 2020 Apr 22. PMID: 32320467.

SUMMARY OF THE STUDY

This is a study performed on 153 adults with a toxic multinodular goiter in Siena, Italy. All patients were treated

with a fixed dose of 15 mCi of radioactive iodine. The authors measured the size of thyroid with ultrasound before and after treatment and followed thyroid hormone levels and thyroid antibodies. They followed these patients for up to 12 years.

One year after the radioactive iodine therapy, the size of the thyroid was reduced by about 30%. Over time, there was further reduction of the thyroid size, with the maximal reduction in size observed after 3-6 years. Subsequently, a total of 22% had an increase in the size of the goiter, but the growth in all cases remained below the initial size of the thyroid. The baseline size of the goiter did not affect the eventual decrease in size obtained after treatment. A total of 61% of the patients had thyroid hormone levels in the normal range at 1 year after radioactive iodine therapy while 11 % remained hyperthyroid and 27% became hypothyroid. Of those that remained hyperthyroid, ~90% of the patients eventually became cured from their hyperthyroidism. There were minimal side effects from the treatment.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The treatment of toxic multinodular with a fixed dose of radioactive iodine (15 mCi) was effective in resolving hyperthyroidism in almost 90% of patients and significantly reducing the size of the goiter by more than half. About a quarter of the patients became hypothyroid. The treatment was well tolerated and safe. This suggests that fixed dose radioactive iodine therapy is effective in treating hyperthyroidism. In addition, the reduction in the size of the goiter seems to be higher in this study as compared to other studies in the literature, suggesting that it may be more effective at reducing the size of the goiter in a population from an iodine insufficient area.

— Susana Ebner MD



HYPERTHYROIDISM, continued

ATA THYROID BROCHURE LINKS

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

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

ABBREVIATIONS & DEFINITIONS

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.

Toxic multinodular goiter: characterized by one or more nodules or lumps in the thyroid that may gradually grow and increase their activity so that the total output of thyroid hormone in the blood is greater than normal.

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.

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

