



HYPERTHYROIDISM

Treatment-induced hypothyroidism reduces long-term posttreatment cardiovascular morbidity and mortality in Graves' Disease and Toxic Multinodular Goiter

BACKGROUND

Hyperthyroidism is caused when the thyroid is overactive and produces too high of levels of thyroid hormones. The 2 most common causes of hyperthyroidism are Graves' disease and toxic multinodular goiter. Antithyroid drugs, radioactive iodine therapy and surgery are all used to treat hyperthyroidism.

Thyroid hormones have major effects on the heart and palpitations and irregular heart rhythms are frequent symptoms caused by hyperthyroidism. Because of this, hyperthyroidism is associated with increased cardiac problems and can lead to death related to heart disease. This study examines the effect of radioactive iodine therapy and surgery on long-term heart disease outcomes in patients with Graves' disease and toxic multinodular goiter and the relationship of these outcomes to post-treatment thyroid status.

THE FULL ARTICLE TITLE

Essi R et al 2018 Cardiovascular morbidity and mortality after treatment of hyperthyroidism with either radioactive iodine or thyroidectomy. *Thyroid*. Epub 2018 Jul 23. PMID: 29882483.

SUMMARY OF THE STUDY

This was a study examining a registry of patients who had been treated for hyperthyroidism in Finland from 1986 through 2007. Surgery patients were identified from procedure codes in the Finland Hospital Discharge Registry. Radioactive iodine therapy patients all were treated at Tampere University Hospital. The discharge diagnoses and dates of hospital admissions were obtained from the Finnish Hospital Discharge Registry. The Population Registration Centre provided information regarding causes of death and residency status.

A control group of Finnish residents from the comprehensive national Population Center was formed by random selection of three age- and sex-matched subjects (for each

patient) who were alive when the hyperthyroid patients were treated. A total 4334 were in the surgery group (615 men and 3719 women) and 1814 in the radioactive iodine therapy group (329 men and 1485 women). The cause of the hyperthyroidism was Graves' disease in 50% of the patients, toxic multinodular goiter in 33% of patients and "unspecified" in 17% of patients. Men and women were of similar ages at the time of treatment for hyperthyroidism.

About 2 years before patients were treated for hyperthyroidism, their hospitalization rates for heart disease began to increase and was 1.6 times more common than in the control patients. Hypertension, atrial fibrillation, coronary artery disease, strokes, heart failure, and valvular disease and cardiomyopathies all were more common in the hyperthyroid patients with atrial fibrillation and other arrhythmias the most common

There was no difference between surgery and radioactive iodine therapy on subsequent hospitalizations for any or all categories of heart disease providing that radioactive iodine therapy was followed by hypothyroidism. In contrast, if radioactive iodine therapy did not result in hypothyroidism, radioactive iodine therapy was associated with a greater risk of subsequent hospitalization for arrhythmias, including atrial fibrillation, and heart failure.

Death due to heart disease was increased in hyperthyroidism patients treated with radioactive iodine therapy as compared to those treated with surgery, but this difference went away of the patients who did not become hypothyroid after radioactive iodine therapy were removed from the analysis. Death was similar in patients with toxic multinodular goiter as compared to those with Graves' disease.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study shows that the rates of hospitalization for heart disease are increased in patients with hyperthy-





HYPERTHYROIDISM, continued

roidism. These rates were decreased after surgery or radioactive iodine therapy that produced hypothyroidism but persisted at the higher rate in patients treated with radioactive iodine therapy who did not develop hypothyroidism. Death also was increased on patients treated with radioactive iodine therapy who did not develop hypo-

thyroidism but was not increased in patients treated with surgery or patients treated with radioactive iodine therapy that did produce hypothyroidism. These data suggest that the goal of radioactive iodine therapy for hyperthyroidism should be to produce hypothyroidism.

— Alan P. Farwell, MD, FACE

ATA THYROID BROCHURE LINKS

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

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

Thyroid Surgery: <https://www.thyroid.org/thyroid-surgery/>

Radioactive Iodine: <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 caused by antibodies that attack the thyroid and turn it on.

Toxic nodular 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.

Thyroidectomy: surgery to remove the entire thyroid gland. When the entire thyroid is removed it is termed a total thyroidectomy. When less is removed, such as in removal of a lobe, it is termed a partial thyroidectomy.

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).

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

