



## HYPERTHYROIDISM

### Does the treatment choice between antithyroid drugs and radioactive iodine in hyperthyroid patients affect the risk of death?

#### BACKGROUND

The 2 most common causes of hyperthyroidism are Graves' Disease and toxic nodular goiter. Treatment options for hyperthyroidism include: radioactive iodine therapy, antithyroid drugs including methimazole or propylthiouracil and surgery. There has been controversy about a possible higher risk of death in the first year after radioactive iodine therapy for hyperthyroidism. One possible cause of this may be the development of an irregular heart rhythm known as atrial fibrillation. This study was done to compare the risk of death in patients treated with antithyroid drugs only to those treated with radioactive iodine. Some of those treated with radioactive iodine became hypothyroid and needed thyroid hormone treatment after therapy while some remained euthyroid without thyroid hormone. The effects of smoking, atrial fibrillation and having other medical illnesses and on the risk of death in these patients was also studied.

#### THE FULL ARTICLE TITLE

Boelaert K et al. Comparison of mortality in hyperthyroidism during periods of treatment with thionamides and after radioiodine. *J Clin Endocrin Metab* 2013; 98: 1869-1882.

#### SUMMARY OF THE STUDY

A total of 1036 patients older than 40 years with hyperthyroidism who were treated in a clinic in Birmingham, England were studied. They were compared to patients without hyperthyroidism. They were followed for more than 10 years and the death rates were determined. About half of the patients had Graves' disease and the others had a toxic nodular goiter. They were treated with either long-term antithyroid drugs or radioactive iodine. There were three groups studied. The first included patients treated with antithyroid drugs only, the second group was treated with radioactive iodine without need for thyroid hormone treatment and the third group was treated with radioactive iodine and became hypothyroid and needed thyroid hormone treatment. The group that got

antithyroid drugs only had a 30% increase in death rate as compared to the non-hyperthyroid general population. The radioactive iodine therapy group which did not need thyroid hormone treatment had a 24% increase in the death rate. In these groups there was an excess of heart deaths. There was no increase in mortality during the first year of followup. The third group treated with radioactive iodine and later thyroid hormone treatment when they became hypothyroid did not have a higher risk of death. This apparent advantage of radioactive iodine therapy followed by hypothyroidism and thyroid hormone treatment was seen only in patients without other medical problems, atrial fibrillation or a smoking history.

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

This study suggests that an increase in deaths in hyperthyroid patients is mainly due to heart causes and that is not observed in patients that become hypothyroid after radioactive iodine therapy. Therefore, the practice of treating patients using long-term antithyroid drugs therapy or RAI therapy with lower doses to avoid hypothyroidism may not be justified, as some patients in both groups may remain mildly hyperthyroid for extended periods of time. A final conclusion is that patients with hyperthyroidism should stop smoking, as smoking reduces the benefit of death risk reduction when hyperthyroidism is completely corrected by RAI therapy.

— Jerrold M. Stock, 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>

Thyroid Hormone Treatment: <http://www.thyroid.org/thyroid-hormone-treatment>

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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.

**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.

**Methimazole:** an antithyroid medication that blocks the thyroid from making thyroid hormone. Methimazole is used to treat hyperthyroidism, especially when it is caused by Graves' disease.

**Propylthiouracil (PTU):** an antithyroid medication that blocks the thyroid from making thyroid hormone. Propylthiouracil is used to treat hyperthyroidism, especially in women during pregnancy.

**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).

**Euthyroid:** 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 doesn't produce enough thyroid hormone. Treatment requires taking thyroid hormone pills.