



HYPERTHYROIDISM

Could pretreatment with MMI be as effective as rhTSH in treating subclinical toxic multinodular goiter with ¹³¹I?

BACKGROUND

A multinodular goiter is an enlarged thyroid gland containing several nodules that are overactive. In the United States, this is most commonly seen in older patients and in immigrant patients coming from areas of iodine deficiency. This can often lead to excess production of thyroid hormone (hyperthyroidism) by the nodules. Even though surgery is an option, in patients who refuse surgery or have increased risks for surgery, treatment with radioactive iodine is reasonable. Because the radioactive iodine uptake in these patients is often low, several approaches have been tried in order to increase the radioactive iodine uptake and make the radioactive iodine more effective in shrinking the goiter. Increasing TSH levels by treating with recombinant human TSH has been shown to be effective but is expensive. Alternatively, TSH levels can be increased by treating with antithyroid drugs or a low iodine diet for a period of time before the radioactive iodine. This study compares the effect of 6 weeks of a low-iodine diet with 6 weeks of treatment with an antithyroid medication called methimazole.

THE FULL ARTICLE TITLE

Kyrilli A et al Thiamazole pretreatment lowers the ¹³¹I activity needed to cure hyperthyroidism in patients with nodular goiter. *J Clin Endocrinol Metab.* April 13, 2015 [E-pub ahead of print].

SUMMARY OF THE STUDY

The study included patients referred to the Nuclear Medicine department at Erasme Hospital in Belgium with mild hyperthyroidism due to a multinodular goiter. Patients were randomly assigned to receive either 6 weeks of a low-iodine diet or 6 weeks of methimazole. Urine

iodine levels and thyroid volumes were measured before treatment and 6 weeks after pretreatment. The dose of radioactive iodine was calculated and the radioactive iodine uptake was measured for each patient.

The authors found that in patients who took methimazole treatment for 6 weeks the average radioactive iodine uptake doubled, reducing the calculated radioactive iodine dose by a third. Treatment with a low-iodine diet for 6 weeks did not affect the radioactive iodine uptake. Approximately 30% of the patients who took methimazole became hypothyroid after the radioactive iodine treatment.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study is important because it shows that methimazole can be used to increase radioactive iodine uptake in patients with mild hyperthyroidism due to a multinodular goiter. However, this study was short and one third of patients developed an underactive thyroid. Therefore, a longer, larger and more closely monitored trial would be beneficial in determining the safety and efficacy of this treatment method as compared to current treatment options.

— Maria Papaleontiou, MD

ATA THYROID BROCHURE LINKS

Goiter: <http://www.thyroid.org/what-is-a-goiter>

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

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

DEFINITIONS AND ABBREVIATIONS

Goiter: A thyroid gland that is enlarged for any reason is called a goiter. A goiter can be seen when the thyroid is overactive, underactive or functioning normally. If there are nodules in the goiter it is called a nodular goiter; if there is more than one nodule it is called a multinodular goiter.

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.



HYPERTHYROIDISM, continued

Recombinant human TSH (rhTSH): human TSH that is produced in the laboratory and used to produce high levels of TSH in patients after an intramuscular injection. This is mainly used in thyroid cancer patients before treating with radioactive iodine or performing a whole body scan. The brand name for rhTSH is Thyrogen™.

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.

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.

TSH: thyroid stimulating hormone — produced by the pituitary gland that regulates thyroid function; also the best screening test to determine if the thyroid is functioning normally.

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.