



## THYROID CANCER

### Radioactive iodine treatment after recombinant TSH is associated with longer retention of the radioactive iodine in the thyroid remnant while reducing exposure to the rest of the body

#### WHAT IS THE STUDY ABOUT?

After surgery for thyroid cancer, many patients are treated with Radioactive Iodine (I-131). This is to destroy any remaining thyroid cancer cells as well as any remaining normal thyroid tissue (thyroid remnant) to allow monitoring of the thyroid cancer long-term. Recombinant TSH (rTSH) has become a mainstay of diagnosis and treatment of thyroid cancer, allowing doctors to produce a high level of TSH in patients without having to stop the thyroid hormone replacement and producing significant symptoms of hypothyroidism. This is important to stimulate any thyroid cells to take up the Radioactive Iodine and, thus, be destroyed. Questions have been raised whether there are differences in levels of I-131 in various body tissues after rTSH treatment as compared to after thyroid hormone withdrawal. It has been theorized that thyroid hormone withdrawal ought to slow the metabolism of the I-131 in the body but might also slow the clearance of the I-131 from thyroid cancer tissue and possibly making the treatment more effective. In this study, I-131 levels were measured in various tissues of thyroid cancer patients after either TSH preparation or thyroid hormone withdrawal.

#### THE FULL ARTICLE TITLE

Taïeb et al. Iodine biokinetics and radioiodine exposure after recombinant thyrotropin-associated remnant ablation in comparison with thyroid hormone withdrawal. *J Clin Endocrinol Metab* 2010. Jc.2009-2528-2528 [pii];101210/jc.2009-2528 [doi].

#### WHAT WAS THE AIM OF THE STUDY?

The aim of the study was to measure I-131 levels in various tissues of thyroid cancer patients after rhTSH preparation or thyroid hormone withdrawal.

#### WHO WAS STUDIED?

The study group included 88 patients with thyroid cancer at the time of their first treatment with radioactive iodine after surgery a single center in Marseille, France. Patients were randomized to receive either rhTSH (43 patients) or thyroid hormone withdrawal (45 patients).

#### HOW WAS THE STUDY DONE?

All of the patients went on a low-iodine diet for two weeks before treatment. Patients either received rhTSH injections on consecutive days before receiving the I-131 or were withdrawn for thyroid hormone for 6 weeks after surgery before receiving the I-131. After receiving the I-131, blood and urine samples were collected for several days and radioactivity given off by the I-131 was measured for several days in thyroid remnant tissue in the neck.

#### WHAT WERE THE RESULTS OF THE STUDY?

The total-body half-life of I-131 was 14.8 h in the rhTSH group as compared to 17.1 h in the thyroid hormone withdrawal group. Thus the overall clearance of I-131 from the body was faster in the rhTSH group than in the thyroid hormone withdrawal group. Surprisingly, the half-life of I-131 in the thyroid remnant tissue was significantly longer after rhTSH (43.5 h) than during thyroid hormone withdrawal (28.7 h).

#### HOW DOES THIS COMPARE WITH OTHER STUDIES?

Other smaller studies had shown that patients treated with I-131 after rhTSH had a lower radiation exposure to the blood as compared to patients treated after thyroid hormone withdrawal. Several other studies have shown that thyroid remnant ablation by radioactive iodine was the same whether the patients received I-131 after rhTSH or after thyroid hormone withdrawal.

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

Treating thyroid cancer patients with I-131 after rhTSH is associated with longer retention of the I-131 in the thyroid remnant while also reducing exposure to the rest of the body and to the general public who came in contact with patients treated with the radioactive iodine. Thus, not only do patients feel dramatically better after rTSH therapy than with after thyroid hormone withdrawal, they are treated just as effectively while reducing the exposure

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## THYROID CANCER, continued

to family members and/or others living with the patient. In countries in which patients are admitted to the hospital for treatment, they should be able to be discharged sooner, thus lowering costs of the hospitalization.

Please see “[A Message to Patients Regarding Thyrogen](#)” on page 3 of this issue.

— Henry Fein, MD

## ATA THYROID BROCHURE LINKS

Thyroid cancer: [http://thyroid.org/patients/patient\\_brochures/cancer\\_of\\_thyroid.html](http://thyroid.org/patients/patient_brochures/cancer_of_thyroid.html)

### 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. 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).

**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™.

**Thyroid Hormone Withdrawal (THW)** — this is used to produce high levels of TSH in patients by stopping thyroid hormone pills and causing short-term hypothyroidism. This is mainly used in thyroid cancer patients before treating with radioactive iodine or performing a whole body scan.

**Thyroid Remnant Ablation** — destruction of the small amount of thyroid tissue that remains after surgery (thyroidectomy) with the use of radioactive iodine.