



## THYROID CANCER

### WHAT IS THE STUDY ABOUT?

For most patients who are diagnosed with thyroid cancer, the first step is surgery to remove the cancer as well as the entire normal thyroid. After surgery, most patients are treated with radioactive iodine (RAI) to destroy any remaining thyroid cells, both normal and cancerous. In order for the RAI to be effective, the patient's TSH levels need to be increased to stimulate the thyroid cells to take up the RAI and be destroyed. The traditional way to raise TSH levels has been to withdraw the patient from thyroid hormone (THW), making the patient hypothyroid for a short period of time. Even short-term hypothyroidism can cause fatigue, depression, lack of concentration and other exhausting symptoms. Within the last year, the FDA has approved the use of recombinant human TSH (rhTSH) to raise TSH levels allowing patients to stay on their thyroid hormone and avoid the short term hypothyroidism. Using high doses of I-131 (100 mCi), both treatments with rhTSH and THW have been shown to be equally effective. Recently, smaller doses of I-131 have been used effectively with THW to destroy remaining thyroid cells in low-risk-patients with thyroid cancer. This study was done to find out whether smaller amounts of I-131 (54 mCi) would also be effective using rhTSH.

**THE FULL ARTICLE TITLE:** Chianelli M, Todino V, Graziano FM, Panunzi C, Pace D, Guglielmi R, Signore A, Papini E. Low-activity (2.0 GBq; 54 mCi) radioiodine post-surgical remnant ablation in thyroid cancer. *Endocrinol* 2009;160:431-6.

### WHAT WAS THE AIM OF THE STUDY?

To determine the effectiveness of low-dose I-131 therapy in patients with low-risk thyroid cancer after THW or rhTSH.

### WHO WAS STUDIED?

A total of 42 patients with low-risk thyroid cancer (tumor size of 1 cm or smaller and without lymph-node metastases) were included in this study.

### HOW WAS THE STUDY DONE?

All patients underwent a total thyroidectomy then were divided into two groups to be treated with 54 mCi of

I-131 after THW or rhTSH.

**THW** – this group were treated with RAI 37 days after THW. Some of the patients were treated with T<sub>3</sub> for the first 28 days

**rhTSH** – this group were treated with two daily injections of rhTSH and the RAI was done 24 hours after the last injection of rhTSH.

6–12 months after the I-131-therapy, the success rate of RAI treatment was determined in both groups by a diagnostic whole-body scan after THW. A successful treatment was one that had a negative whole body scan.

### WHAT WERE THE RESULTS OF THE STUDY?

Both THW and rhTSH were very effective options to raise TSH levels before the low dose RAI. A total of 20/21 patients in the THW groups had negative whole body scans while 19/21 patients in the rhTSH group had negative scans. There was no difference in the success rate between the two groups.

### HOW DOES THIS COMPARE WITH OTHER STUDIES?

There is controversy as to whether treating low risk patients with RAI is needed, although it has been shown to decrease the risk of having the cancer come back. For those recommending treatment, the lowest dose possible is the best option. Previous studies have shown that 30 mCi of I-131 is too low of a dose for rhTSH to be effective. Another study showed that 100 mCi I-131 is effective in both THW or rhTSH.

### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

In low-risk patients with thyroid cancer, rhTSH can be used along with low dose RAI (54 mCi I-131) to effectively destroy both normal and cancerous cells after surgery.

— Jamshid Farahati, 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)

Hypothyroidism: [http://thyroid.org/patients/patient\\_brochures/hypothyroidism.html](http://thyroid.org/patients/patient_brochures/hypothyroidism.html)



## THYROID CANCER, continued

### ABBREVIATIONS & DEFINITIONS

**Total thyroidectomy** — Surgery to remove the entire thyroid gland.

**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).

**mCi** — millicurie, the units used for I-131.

**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.

**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.

**Levothyroxine** — the major hormone produced by the thyroid gland and available in pill form as Levoxyl™, Synthroid™, Levotheroid™ and generic preparations.

**Triiodothyronine (T<sub>3</sub>)** — the active thyroid hormone, usually produced from thyroxine, available in pill form as Cytomel™.



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