



THYROID CANCER

The first administration of radioiodine following total thyroidectomy for thyroid cancer can destroy metastatic thyroid cancer

WHAT IS THE STUDY ABOUT?

After surgery, many patients with thyroid cancer are treated with radioactive iodine. The main reason to treat with radioactive iodine is to destroy any normal thyroid tissue remaining in the thyroid bed (thyroid remnant) as well as thyroid cancer remaining after surgery. After the radioactive iodine treatment, a whole body scan (post-RAI WBS) is done to identify any thyroid cancer that has spread outside the thyroid bed (ie become metastatic). In order for radioactive iodine to be effective, the patient's TSH levels need to be increased to stimulate the thyroid cells to take up the radioactive iodine and be destroyed. There are two ways to increase TSH: 1) withdraw the patient from thyroid hormone (THW), making the patient hypothyroid for a short period of time or 2) use recombinant human TSH (rhTSH) to allow patients to stay on their thyroid hormone and avoid the short term hypothyroidism. It is clear that metastatic thyroid cancer can be identified on the post-RAI WBS following THW. It is not entirely clear if this also occurs with radioactive iodine after rhTSH. There is also uncertainty if the initial radioactive iodine treatment after surgery effectively destroys the metastatic thyroid cancer. The aims of this study were: 1) to determine if radioactive iodine therapy after rhTSH could identify metastatic thyroid cancer outside the neck on the post-RAI WBS and 2) to determine if the initial radioactive iodine treatment, either by rhTSH or THW, is effective in destroying the metastatic thyroid cancer.

THE FULL ARTICLE TITLE:

Tuttle RM. et al. Radioactive iodine administered for thyroid remnant ablation following recombinant human thyroid stimulating hormone preparation also has an important adjuvant therapy function. *Thyroid* 2010;20:257-63.

WHAT WAS THE AIM OF THE STUDY?

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2) to determine if the initial radioactive iodine treatment, either by rhTSH or THW, is effective in destroying the metastatic thyroid cancer.

WHO WAS STUDIED?

The study subjects were 394 patients treated with radioactive iodine for papillary or follicular thyroid cancer at the Memorial Sloan-Kettering Cancer Center from 1997 through 2005.

HOW WAS THE STUDY DONE?

The medical records and radioactive iodine post-RAI WBS of the 394 study patients were reviewed. Some of these patients were prepared for the radioactive iodine by THW while others received rhTSH before the radioactive iodine. In all patients who were found to have metastatic thyroid cancer in the lungs, a computed tomography (CT) of the chest was also obtained for comparison. Patients had follow up at 6-12 months intervals and most patients also had a diagnostic rhTSH-WBS 12 to 18 months after the initial radioactive iodine treatment. Patients who had negative diagnostic WBS and thyroglobulin (Tg) levels < 2 ng/ml were considered to have no evidence of disease.

WHAT WERE THE RESULTS OF THE STUDY?

Of the 394 patients, 84 had spread of the thyroid cancer outside of the thyroid bed diagnosed on the post-RAI WBS. Of these 84 patients, 64 were treated after rhTSH and 20 were treated after THW. Most of these patients (76) had thyroid cancer limited to the neck while 8 patients either had lung metastases only, or cancer in both the neck region and lungs. Of these 8 patients, 4 were treated after rhTSH and 4 after THW.

After approximately 2.7 years from the initial radioactive iodine treatment, 56 of the 84 patients (67%) no longer had evidence of the thyroid cancer. Of the patients with persistent thyroid cancer, 19 were treated with radioactive iodine after rhTSH (30%) while 9 were treated after THW (45%).

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THYROID CANCER, continued

HOW DOES THIS COMPARE WITH OTHER STUDIES?

A recent study of 72 patients with thyroid cancer evaluated whether patients had similar results after receiving either low dose or high dose radioactive iodine after rhTSH. The study found that both doses had similar success rates (approximately 75%), even in patients with metastatic thyroid cancer limited to the neck.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study shows that initial radioactive iodine treatment after surgery is effective for metastatic thyroid cancer that

has spread outside the thyroid bed and outside the neck (ie to the lungs). Similar results were obtained by radioactive iodine after either rhTSH or THW.

— M. Regina Castro, MD

ATA THYROID BROCHURE LINKS

Thyroid cancer: 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).

Post- Radioactive iodine Whole Body Scan (post-RAI WBS) — the scan done after radioactive iodine treatment that identifies what was treated and if there is any evidence of metastatic thyroid cancer.

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.

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™.

Papillary thyroid cancer — the most common type of thyroid cancer.

Follicular thyroid cancer — the second most common type of thyroid cancer.