



THYROID CANCER

Elevated thyroglobulin levels at time of radioiodine therapy for thyroid cancer predicts residual or persistent cancer

BACKGROUND

Currently, radioactive iodine therapy for thyroid cancer is reserved for those patients at moderate or increased risk of thyroid cancer recurrence. In order to effectively treat with radioactive iodine, TSH levels have to be increased to stimulate any thyroid cells into taking up the radioactive iodine. This is done by either making patients hypothyroid after stopping thyroid hormone (thyroid hormone withdrawal, THW) or by treating with recombinant human TSH (rhTSH, Thyrogen™).

To plan appropriate therapy, methods for predicting residual or persistent thyroid cancer after surgery have been studied. Measuring thyroglobulin levels before or just after radioactive iodine therapy when TSH levels are high has been suggested as a predictor of persistent or residual disease. The goal of this study was to examine if stimulated thyroglobulin levels just prior to radioiodine are predictive of cancer persistence or recurrence.

THE FULL ARTICLE TITLE

Ciappuccini R et al. Stimulated thyroglobulin level at ablation in differentiated thyroid cancer: the impact of treatment preparation modalities and tumor burden. *Eur J Endocrinol* 2014;171:247-52. Epub May 27, 2014.

SUMMARY OF THE STUDY

A total of 308 consecutive patients were evaluated with thyroglobulin just before radioiodine treatment. A total of 123 patients were prepared using rhTSH and 185 were prepared with THW. More of the patients prepared with THW had spread of the cancer outside the neck. All 8 of

the patients with poorly-differentiated thyroid cancer were treated with THW. Patients prepared with THW more commonly had larger tumors and either unknown lymph node status or more lymph node metastasis than patients prepared with rhTSH. The patients were followed for 43 months on average. A total of 56 patients had persistent or residual cancer: 42 were in the THW group, 14 in the rhTSH group.

Patients with definite metastatic disease had higher stimulated thyroglobulin levels with THW preparation than with rhTSH. In patients with persistent or residual disease, thyroglobulin levels after THW were 99.5ng/mL as compared to 13.5ng/mL after rhTSH. In patients who were disease-free, the after thyroglobulin was 1.2 ng/mL after rhTSH and 3.2 ng/mL after THW. Thyroglobulin levels above 2.8 after rhTSH preparation and above 28 ng/mL after THW were predictive of persistent or residual cancer.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study indicates that thyroglobulin levels prior to radioactive iodine therapy can be used to predict persistent or residual cancer. This is helpful to identify patients that need to be followed more closely for cancer recurrence.

— Julie Hallanger Johnson, MD

ATA THYROID BROCHURE LINKS

Thyroid cancer: <http://www.thyroid.org/cancer-of-the-thyroid-gland>

ABBREVIATIONS & DEFINITIONS

Thyroglobulin: a protein made only by thyroid cells, both normal and cancerous. When all normal thyroid tissue is destroyed after radioactive iodine therapy in patients with thyroid cancer, thyroglobulin can be used as a thyroid cancer marker in patients that do not have thyroglobulin antibodies.

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, continued

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.

Stimulated thyroglobulin testing: this test is used to measure whether there is any cancer present in a patient that has previously been treated with surgery and radioactive iodine. TSH levels are increased, either by withdrawing the patient from thyroid hormone or treating the patient with recombinant human TSH, then

levels of thyroglobulin are measured. Sometimes this test is combined with a whole body iodine scan.

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).