STIMULATED THYROGLOBULIN <0.2 NG/ML PREDICTS A NEGATIVE RADIOIODINE SCAN IN HIGH-RISK THYROID CANCER PATIENTS

de Meer SG, Vriens MR, Zelissen PM, Borel Rinkes IH, de Keizer B. The role of routine diagnostic radioiodine whole-body scintigraphy in patients with high-risk differentiated thyroid cancer. J Nucl Med 2011;52:56-9. Epub December 13, 2010.

SUMMARY • • • • • • • RESULTS . . .

BACKGROUND

In patients with low-risk differentiated thyroid carcinoma, thyrotropin (TSH)-stimulated serum thyroglobulin is a more sensitive indicator of recurrence than whole-body radioiodine scans. However, this has not been shown for patients with more advanced stages of differentiated thyroid cancer. The purpose of this study was to determine whether routine diagnostic whole-body scans 6 to 12 months after initial treatment provide additional information to that provided by TSH-stimulated thyroglobulin measurements during the first year of follow-up of high-risk differentiated thyroid carcinoma.

METHODS

High-risk patients were those with tumors larger than 4 cm or tumors that were locally invasive or were associated with positive lymph nodes. Patients with distant metastasis were excluded. Stimulated thyroglobulin (Tg) was measured after recombinant human TSH (rhTSH) and compared with scans made using 100 MBq (2.7 mCi) diagnostic doses of radioactive iodine (^{131}I) . The sensitivity of the Tg measurement was 0.2 ng/ml.

The study population was 112 patients; 81% had papillary carcinoma and 19% had follicular carcinoma. The median age was 48 years. The median tumor size was 30 mm; 43% were tumor-node-metastasis stage I. Stimulated Tg was >0.2 ng/ml in 65%; 8 patients of this group had positive scans. In 6 patients, there was recurrence only in the neck. One patient had a distant metastasis to the skull and another to the lung and brain.

Clinical

THYROIDOLOGY

Stimulated Tg was <0.2 ng/ml in 30% of patients. Only 1 of these patients had a positive scan in the neck. Additional studies did not reveal a source, and a diagnostic scan 1 year later was negative in this patient. Five percent of the patients had thyroglobulin antibodies that made the measurement of thyroglobulin unreliable.

CONCLUSIONS

Because the negative predictive value of stimulated thyroglobulin levels <0.2 ng/ml for disease recurrence in this study was 100%, the addition of a diagnostic whole-body scan offered no additional information.

COMMENTARY • • • • • •

Although the patients in this study were considered high risk, 43% were TNM stage I, presumably people under age 45, who have a more favorable prognosis. Only about one third of the 112 high-risk patients had stimulated Tg <0.2 ng/ml, so a generalization based on this relatively small group must be considered tentative. Nevertheless, the results show that stimulated Tg is a more sensitive indicator of recurrence than is the diagnostic scan, thus confirming the findings and practice in patients with low-risk thyroid cancer (1,2).

In my practice, I continue to perform diagnostic scans using 4 mCi of ¹³¹I in most patients when I use rhTSH because the scan adds a relatively small additional cost to that of the rhTSH plus some inconvenience to the patient. But this must be balanced against the need to do a radioiodine scan when the stimulated Tg is positive, so why not do the scan as part of the initial procedure, especially in high-risk patients?

— Jerome M. Hershman, M.D.

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References

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