

THYROID

Recombinant human TSH improves sensitivity of ^{18}F fludeoxyglucose PET

Administration of recombinant human TSH (rhTSH) before ^{18}F fludeoxyglucose (FDG) PET improves the sensitivity of this test, say the authors of a prospective, multicenter study published in the *Journal of Clinical Endocrinology and Metabolism*.

Residual, differentiated thyroid carcinoma after initial therapy can be detected by FDG-PET scans. Several reports suggest that the sensitivity of this test is improved by TSH stimulation, which can be achieved by withdrawal of levothyroxine or administration of rhTSH. Furthermore, TSH stimulation increases the uptake of FDG by residual tumor tissue. Sophie Leboulleux (Institut Gustave Roussy, Villejuif, France) and her colleagues conducted a study to assess the incremental effects of rhTSH administration on the number of lesions detected by FDG-PET and subsequent clinical management of patients found to have residual tumors.

The researchers enrolled 63 patients with serum thyroglobulin levels $\geq 10 \mu\text{g/l}$ after initial treatment of differentiated thyroid carcinoma. Basal FDG-PET scans were performed during levothyroxine therapy; stimulated FDG-PET scans were performed after intramuscular administration of 0.9 mg rhTSH on two consecutive days. All images were randomly reviewed by two independent nuclear medicine physicians. Clinical-management plans were assessed

before imaging, after the basal scan, and after the rhTSH-stimulated scan.

A total of 108 lesions were detected in 48 organs of 30 patients. The rhTSH-stimulated scan was more sensitive than the basal scan for detection of lesions with an increased uptake of FDG. Although use of the rhTSH-stimulated scan led to an increase in the number of lesions detected, the number of patients for whom any lesion was detected did not differ between the two imaging methods. The clinical-management plan was changed for 12 of the patients in response to the results of the basal scan. By contrast, the clinical-management plan was altered for only eight patients after the rhTSH-stimulated scan, four of whom were confirmed to have residual disease by a histopathological examination.

Leboulleux concludes that a follow-up study that focuses on a large number of patients with elevated serum thyroglobulin levels and no known distant metastases might be necessary before the true value of rhTSH stimulation is revealed.

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Original article Leboulleux, S. *et al.* Assessment of the incremental value of recombinant TSH stimulation before FDG PET/CT imaging to localize residual differentiated thyroid cancer. *J. Clin. Endocrinol. Metab.* [doi:10.1210/jc.2008-1747] (2009).