Guidelines For Whole-Body Scanning For Surveillance of Well-Differentiated Thyroid Carcinoma

Introduction

Please see guidance document for arranging ablative radioiodine for general points on thyroid cancer and recombinant TSH.

rhTSH was approved for diagnostic use after being tested in two large multicentre studies. The first found that whole body scanning (WBS) results after two doses of rhTSH, given while thyroxine therapy was continued, were of good quality and equivalent to scans performed after thyroid hormone withdrawal in 66% of patients, superior in 5% and inferior in 29% (Ladenson et al, 1997). A second study tested the effects of two rhTSH dosing schedules on WBS and serum thyroglobulin levels compared with those after thyroxine withdrawal. The scanning method was more carefully standardized, taking into account the lower renal clearance of I131 in hypothyroidism than after rhTSH. Scans were concordant in 89% of patients, superior in 4% after rhTSH and superior in 8% after thyroid hormone withdrawal, differences that were not statistically significant. The most important finding was that the combination of WBS and serum thyroglobulin measurements detected 100% of the patients with metastatic differentiated thyroid cancer and 93% of cases of thyroid remnant (Haugen et al, 1999).

rhTSH treatment should now be considered standard for all patients undergoing WBS (excepting those performed after an ablative or therapeutic doses of radioiodine).

Protocol for use of recombinant TSH

NB: Kathleen Gough (Metabolic Unit sister) may prefer to arrange all this herself, in which case she just needs a blue form, Nuclear Medicine request card and prescription for Thyrogen.

1. Book I131 WBS with nuclear medicine department (x32038). Arrange i) scan to be carried out on Friday, and ii) a tracing dose of I131 to be administered on preceding Wednesday (tell nuclear medicine it is a ‘thyrogen scan’ and they will know to do this).
2. Inform Sister Gough of above dates and she will arrange for rhTSH to be ordered.
3. On Monday of the scan week (Day 1), patient attends metabolic unit at 10am (or time arranged by nurses). Blood should be withdrawn for serum TSH and thyroglobulin, and then 0.9 mg rhTSH should be administered by deep intramuscular injection. On Tuesday (Day 2), patient reattends metabolic unit at 10am, and 0.9 mg rhTSH is administered by deep intramuscular injection.
4. On Wednesday (Day 3) patient attends Metabolic Unit for measurement of TSH (should be >30mU/l) and nuclear medicine department for tracer dose (150MBq) of I131.
5. On Friday (Day 5) the patient should attend i) the metabolic unit for measurement of serum thyroglobulin, and then proceed to ii) nuclear medicine department for whole body scanning.

A serum Tg of 2.0 ng/ml or higher 72 hours after the last rhTSH injection (Day 5) indicates that thyroid tissue or differentiated thyroid cancer is present, which almost always can be
identified on the rhTSH-stimulated WBS, provided the recommended scanning procedure is followed (whole body images are acquired after 30 minutes of scanning or after 140,000 counts).

**Side effects of rhTSH**

Nausea (10.5%)
Headache (7.3%)
Asthenia (3.4%)
Vomiting (2.1%)
Dizziness (1.6%)
Paraesthesia (1.6%)

Patients with CNS metastases may rarely develop acute neurological deficits after rhTSH administration, and acute dysphagia has been reported due to paratracheal metastases. Theoretically, hyperthyroidism may occur in non-thyroidectomised patients.

**References**


