

UTILITY OF ^{99m}Tc-PERTECHNETATE THYROID UPTAKE IN DIFFERENTIATION OF HYPERTHYROID AND EUTHYROID PATIENTS

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Due to a high correlation reported between ^{99m}Tc-pertechnetate thyroid uptake (TcTU) and the clearance of ¹²³I, the TcTU can be used for thyroidal iodine clearance estimation.

THE AIM OF THIS STUDY was to assess whether the rate of the TcTU is a reliable method to differentiate between hyperthyroid and euthyroid patients.

PATIENTS AND METHODS: According to the clinical features and levels of TT3, TT4 and TSH the patients were divided into 3 groups: 1. nineteen patients (13 women) with Graves' disease (GD), mean age 50.5 ± 8.3 years; 2. six patients (5 women) with toxic adenoma (TA), mean age 52.2 ± 11.4 years, and 3. fourteen euthyroid individuals (EUT), 13 women, mean age 44.4 ± 13.5 years. Images of the neck were obtained 20 minutes after injection of 185 MBq of ^{99m}Tc-pertechnetate. Both thyroid and syringe counts before and after injection were measured under the same conditions (LEAP collimator, 60 seconds acquisition, 128x128 matrix, 1.5 zoom factor). Thyroid and syringe counts were corrected for background counts and radionuclide decay. The TcTU was calculated as a percentage of net applied activity accumulated in the thyroid gland.

RESULTS: Among euthyroid individuals the TcTU was $1.21\% \pm 0.77$ (range 0.32 - 2.73%). In the GD and TA groups a mean values of TcTU were $14.8\% \pm 9.5$ (range 2.68 - 31.1%) and $6.59\% \pm 5.27$ (range 2.22 - 15.0%), respectively. The differences in the values of TcTU were found significant for GD ($p < 0.0001$) and TA ($p = 0.002$) as compared to EUT, but not significant between GD and TA ($p = 0.063$, Mann-Whitney U test). In addition, a good correlation was proved between TcTU and TT4 values ($p = 0.024$) in TA patients.

CONCLUSION: The simplicity and reproducibility of this methodology make that TcTU could be used for differentiating hyperthyroid from euthyroid patients.

Key words: hyperthyroidism, euthyroidism, ^{99m}Tc-pertechnetate uptake