

STUDIES ON IODINE RESTRICTION OF THYROIDAL - ¹³¹I - UPTAKE

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[Purpose] In order to examine thyroidal -¹³¹I - uptake more easily, the possibility to relieve the iodine restriction was investigated.

[Methods] In 1976, all foods which contained iodine and in 1977, only seaweeds and its products were restricted for two weeks. After these restrictions of iodine intake, thyroidal-¹³¹I - uptake at 3 and 24 hours were examined. From Table of Japanese Food Components, it was considered that iodine uptake was less than 180 μg/day (as inorganic iodine) in 1976 and from 250 to 400 μg/day in 1977.

[Materials] From outpatients of Tokoname city hospital, 15 normal subjects in 1976 (and 14 normal subjects in 1977), 19. (20) hyperthyroidism, 27. (25) chronic thyroiditis, 9. (9) nontoxic diffuse goiter and 12. (12) subacute thyroiditis (contained patients in recovery state) were investigated.

[Results] In normal subjects, thyroidal-¹³¹I - uptake (M±SE) was (3) 12.2±0.7 (24) 24.6±1.9% in 1976 and 11.5±0.8 (24) 24.1±2.2% in 1977. In patients with hyperthyroidism, it was (3) 58.3±3.9 (24) 69.6±3.8% in 1976 and (3) 63.3±4.4 (24) 77.3±2.6% in 1977. In patients with chronic thyroiditis, it was (3) 19.9±3.8 (24) 28.3±4.7% in 1976 and (3) 18.0±3.2 (24) 28.1±4.6% in 1977. In patients with nontoxic diffuse goiter, it was (3) 11.1±1.2 (24) 23.0±3.9% in 1976 and (3) 11.6±1.4 (24) 25.5±4.1% in 1977. In patients with subacute thyroiditis, it was (3) 13.7±2.5 (24) 28.9±6.5% in 1976 and (3) 13.7±3.1 (24) 24.3±6.4% in 1977. In all subjects, it was (3) 26.1±2.6 (24) 37.0±2.9% in 1976 and (3) 26.8±2.9 (24) 38.8±3.2% in 1977. Between every data of thyroidal -¹³¹I - uptake in each years, there was no statistical significancy. And there was no trouble to judge any clinical states of patients with thyroidal disorder.

[Conclusion] These results suggested that it was possible to relieve the iodine restriction from less than 180 μg/day to 250 ~ 400 μg/day on the examination of thyroidal-¹³¹I - uptake.

CLINICAL EVALUATION OF 20-MINUTE Tc-99m NECK/THIGH RATIO

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The 20-min Tc-99m neck/thigh ratio was determined in 239 subjects. Included were 16 normals, 17 thyroid neoplasms, 7 subacute thyroiditis, 27 chronic thyroiditis, 167 Graves' diseases, and 5 cases who were undergone total thyroidectomy.

The neck/thigh ratio was determined by taking 1-min counts over the thyroid and the thigh 20 min after the i.v. injection of 1mCi of Tc-99m pertechnetate. Scintillation detector with 2-in. NaI crystal was used. The machine was peaked at 140KeV, with a 10% pulse-height window. Source-to-crystal distance was 30cm employing a cylindrical shield 8cm in diameter. The probe was placed below the upper border of the thyroid cartilage on the neck and 10cm above the patella on the thigh. The repeated determination after 3 days resulted in within 9.5% of the initial value. The average difference between the 2 sets in 12 cases was 2.3%. The Tc-N/T ratio expressed in logarithm in 25 cases correlated well with 24-hr I-131 uptake rate ($r=0.883$, $P<0.01$).

Normal values for the N/T ratio were established from 16 normals by calculating +2SD based on log-normal distribution, ranging from 2.2 to 3.9. The distributions of N/T ratio in thyroid disorders were 1.8 to 2.2 for thyroidectomised patients, 2.5 to 4.6 for neoplasms, 2.0 to 2.6 for subacute thyroiditis, 2.4 to 34.1 for chronic thyroiditis and 5.8 to 27.4 for untreated Graves' disease respectively. The values in 97 patients under antithyroid medication were 2.4 to 34.8, which were not statistically significant from untreated group, although 5 of the patients were in the normal range. Of patients who were in remission for over one year after antithyroid medication and I-131 therapy, 9 of 20 (45%) and 21 of 35 (60%) respectively were in the normal range. The differences of N/T ratios between untreated group and patients in remission were found to be statistically significant ($P<0.01$).

It was concluded that the 20-min Tc-99m N/T ratio is a quick, simple and reproducible test for the follow-up of Graves' disease patients under antithyroid medication and in remission.