

nuclide were performed as the R.O.I. curves (Region of Interest).

Result:

The uptake curves and the R.O.I. curves

in the simultaneous measurement of two nuclides, showed difference according to the function and the region of thyroid.

Clinical Application of Thyroid Tumor Scanning with $^{197}\text{HgCl}_2$

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Various tumor scanning agents have been studied as a diagnostic method of malignant tumors. Recently, we applied scintillation scanning with $^{197}\text{HgCl}_2$ to the disease of the thyroid and found that $^{197}\text{HgCl}_2$ concentrated in thyroid cancer. The diagnostic usefulness of ^{197}Hg scanning for various thyroid disease was studied.

Nine patients with thyroid cancer shown cold nodule with ^{131}I scanning were scanned after injection of $^{197}\text{HgCl}_2$. The positive scanning of tumor could be obtained in 8 out of 9 patients with thyroid cancer. Only one case having cystic degeneration showed negative scanning. Since two of 13 patients with

thyroid adenoma revealed positive scanning, it may be possible to differentiate benign and malignant tumor of the thyroid.

In chronic thyroiditis, positive delineation was obtained in 6 out of 7 patients. It is impossible to differentiate from thyroid cancer by ^{197}Hg scanning alone, but it may be generally possible to differentiate both disease by ^{131}I scintigram. In all patients with hyperthyroidism radiomercury did not concentrate in the thyroid gland.

These findings suggest that ^{197}Hg scanning may be a valuable diagnostic method for the detection of thyroid cancer.

Radioimmunoassay of Serum Triiodothyronine in Thyroid Diseases

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Serum levels of triiodothyronine (T_3) were determined in normal subjects and patients with various thyroid diseases by radioimmunoassay using Dainabot's assay kit. The sensi-

bility of the assay was at the level of 0.125 ng/ml. The precisions of intra-assay and inter-assay were 6.7% and 11.0% respectively.

The concentration of T_3 was 1.33 ± 0.27

(mean \pm S.D.) ng/ml in control subjects, 5.09 \pm 2.40ng/ml in patients with hyperthyroidism and 0.52 \pm 0.28ng/ml in patients with hypothyroidism. The value was 1.19 \pm 0.37ng/ml in patients with chronic thyroiditis and 2.05 \pm 0.70ng/ml in those with subacute thyroiditis. Patients with simple goiter and nodular goiter had normal T₃ concentration.

The discrepancies between T₃ levels and values of T₃-RSU, T₄ and T₇ were noted in patients with hyperthyroidism and hypothyroidism under treatment. Some of patients with

hyperthyroidism receiving antithyroid drugs and those with hypothyroidism taking desiccated thyroids had high levels of T₃, whereas values of T₃-RSU, T₄ and T₇ were in normal range. Other cases of hyperthyroidism under therapy had normal T₃ concentration with low values of T₃-RSU, T₄ and T₇. The discrepancy was also noticed in patients with anorexia nervosa, having significantly lowered levels of T₃ and normal values of T₃-RSU, T₄ and T₇.

Radioimmunoassay for Measurement of Triiodothyronine in Human Serum and Urine

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A radioimmunoassay (RIA) system for measurement of triiodothyronine (T₃) in human serum and urine has been developed. A specific antibody to T₃ was prepared in rabbits by immunization with a conjugate of T₃ with human serum albumin. 8-anilino-1-naphthalene sulfonic acid was used for TBG inhibitor. Normal human serum (or urine) was treated with dextran-coated charcoal and added to standard as T₃ free serum (or urine). Bound form was separated from free form by means of double antibody method. Cross-reactivity with T₄ was less than 0.01% in the T₃ RIA system. The recovery of added T₃ to serum (or urine) was 96–108%. Dilution of serum (or urine) resulted in parallel curves to that obtained for the standard T₃. The minimal detectable amount of T₃ was 12.5ng/dl when 50 μ l of serum was assayed. Coefficient variation for serum T₃ determination was 4.9–6.0% (within-assay) and 6.7

–8.8% (between-assay) respectively. Serum concentrations of T₄ and T₃ were determined in various disorders which were divided in 6 groups ie. [I] normal T₄ and T₃ [II] increased T₄ and T₃ [III] decreased T₄ and T₃ [IV] normal T₄ and increased T₃ [V] decreased T₄ and normal T₃ and [VI] normal T₄ decreased T₃. Untreated patients with Graves' disease showed I, II, IV, treated patients I, II, III, IV, V, hyperfunctioning nodular goiter I, II, IV, hypothalamic-pituitary tumors I, III, V, TBG deficiency III, pregnancy I, II, hydantidiform mole or chorioncarcinoma I, II, IV, and anorexia nervosa VI. There was a good correlation between serum concentration and urinary excretion of T₃ in normal subjects and patients with hyper and hypo-thyroidism. In nephrotic syndrome, however, serum T₃ level was low but urinary T₃ was normal or increased. The absolute values of T₃ concentrations in urine (or even in serum) were not