be less than one hour and so on.

Thyopac-4 and Res-O-Mat T4 test were examined on the same sera of 153 cases. Additionally in 112 cases (55 euthyroid, 26 hyperthyroid, 10 hypothyroid, 18 pregnancy and 3 nephrotic syndrome) of them, Thyopac-3 test was simultaneously performed for the purpose of the investigation on thyopac free thyroxine index (FT4I) calculated as Thyopac-4 value × 100/Thyopac-3 value.

Thyopac-4 values in various groups were as follows: 1) euthyroid, 8.5 ± 2.4 μg/dl (mean ± SD); 2) hyperthyroid, ober 20.0 ± ober 5.0; 3) hypothyroid, 2.5 ± 1.5; 4) pregnancy, 13.3 ± 2.4 and 5) nephrotic, 4.2 ± 0.4. In the manner, there was almost no overlapping between euthyroid, hyperthyroid and hypothyroid while the values in pregnancy were generally high and in nephrotic low as compared with euthyroid.

Correlation between Tyopac-4 and Res-O-Mat T4 values was sufficiently estimated (the coefficient of correlation = +0.80) although the former was frequently evaluated to be somewhat smaller than the latter.

Thyopac FT4I in the various groups were as follows: 1) euthyroid, 7.6 ± 2.3; 2) hyperthyroid, ober 27.3 ± ober 9.6; 3) hypothyroid, 2.1 ± 1.1; 4) pregnancy, 9.8 ± 2.4 and 5) nephrotic, 5.6 ± 1.2. The values in pregnancy and nephrotic were all but inside the normal range which was supposed to be 3.0 to 12.2, and on the other hand in hyperthyroid and hypothyroid outside well. Accordingly, the value may indicate the true thyroid status, and may be a more accurate diagnostic aid than Thyopac-3 or -4 test alone.

Studies of Competitive Binding Radioassay Methods for Measurement of Thyroglobulin and Antithyroglobulin Antibodies in Human Serum

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For the purpose of developing a sensitive solid-state radioimmunoassay for Thyroglobulin (TG) and anti-Thyroglobulin antibody (anti-TG), the purification of anti-TG was performed using an immunoadsorbent technique.

The immunoadsorbent was prepared by coupling purified TG to cyanogen bromide activated sepharose and was packed in a column.

IgG globulin fraction of human or rabbit antisera was passed through the column and the column was washed thoroughly.

Specific anti-TG bound to TG was then eluted with 0.17 M glycine-HCl, pH 2.3 or 4 M NaI.

From the cumulative bound percent of labeled material to a series of ten plastic tubes coated with TG, eluted anti-TGs were found to have purities of 20 to 50%.

Measurement of anti-TG or TG using these relatively purified anti-TGs were attempted.

Anti-TG were measured by using cups coated with TG in the same fashion as described previously in the case of crude anti-TG IgG.

Using purified antibody IgG the sensitivity of the assay was improved by 10 times as former and 0.03 μg of anti-TG IgG could be detected.

For TG determination, known amounts of TG or serum samples were added to the cups coated with crude antibody and were incubated over night at 4°C. After washing, uniform amount of labeled purified anti-TG was poured into

cups and after the other overnight incubation, the cups was again washed and counted. The least detectable serum TG concentrations by this method was 4 ng/ml.

Serum TG concentrations in 11 patients with various thyroid disorders were measured. Low or undetectable TG concentrations were observed in 4 cases with chronic thyroiditis.

In one case each of Graves' disease and subacute thyroiditis had high values of 480 and 280 ng/ml, respectively. Other cases with treated Graves' disease, simple goitre and follicular adenoma had various values ranging from undetectable to 160 ng/ml.

Scintigrams of Low-^{131}I-Uptake Thyroid Using ^{99m}Tc-Pertechnetate

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^{99m}Tc-pertechnetate as a scanning agent for the thyroid has more advantages than ^{131}I in the quality of scintiphotogram as well as in the radiation dose received.

The advantages were proved especially in the patient whose ^{131}I uptake was less than 15%.

The Dynamic Thyroid Study

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In 1971, Ashkar and Smith developed a single-visit evaluation method of thyroid function using Tc-99m pertechnetate and the Anger gamma camera. As the index of function, they measured the carotid-thyroid transit time (CTTT). It correlated well with other thyroid function tests. A similar and more quantitative test of thyroid function has been attempted by us.

An Anger gamma camera with 4,000 hole collimator is used. The patient is in a prone position facing the detector, with the neck extended. Tc-99m pertechnetate (0.2 mCi/Kg body weight) is injected into the antecubital vein as a bolus. While a 35 mm camera takes serial images every 1.5 seconds, continous recording is made on the magnetic tape for five minutes. When replaying to obtain the accumulation curve, the region of interest is selected so as to include the whole thyroid gland. We measure "O", which is angle of the slope of the curve at one minute after the injection.

The O correlated well with 24-hour I-131 uptake in hyperthyroidism. However, it was difficult to differentiate euthyroid condition from hypothyroid condition because in either condition the O was too small to be accurately measured.

The advantages of our dynamic thyroid study:

1. Single visit study is enough.
2. Radiation dose to patient is lower.
3. No pre-conditionings of patient are required such as eliminating foods that contain high levels of iodine from the diet.
4. Our method enables us to assess thyroid function in hyperthyroidism more quantitatively than CTTT.