

value. This fact was considered to suggest the presence of subclinical hypothyroidism and occurrence of late developed hypothyroidism.

Serological test, using the tanned red-cell haemagglutination technique, in relation to hypothyroidism after  $^{131}\text{I}$  treatment showed

no significant difference in euthyroid and hypothyroid patients, but the incidence of thyroid autoantibody was higher in the late developed hypothyroidism than in hypothyroidism appearing in a year after the  $^{131}\text{I}$  treatment.

## Studies on the distribution of $^{131}\text{I}$ in human body by whole body counting

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The study of the distribution of  $^{131}\text{I}$  in the human body is of prime importance both for study of the whole body metabolism of iodine and nuclear health problems.

The original scintigrams were obtained with two collimated NaI (TI) crystals that were motor-driven along a long axis of the body inserting a subject between them, at the various intervals after oral administration of Na  $^{131}\text{I}$ . The distortion in scintigrams due to a finite resolution of the collimeter was corrected using the iterative approximation method. Effects of antithyroid drugs such as NaI or mercapazole were also investigated on the distribution of  $^{131}\text{I}$  in the body.

Total body retention curve of  $^{131}\text{I}$  in a

adult male subject indicated two phases of exponential elimination. The curve of the thyroidal region decreased exponentially after a few days, and the rate of decline of radioactivity was slightly faster than the total body retention. The curve of legs in the second phase indicated increasing tendency and this is probably due to the accumulation of hormonal  $^{131}\text{I}$  in the tissue.

Two phases of exponential elimination was also observed in the total body retention curve following administration of the drugs and this suggests the presence of the slowly exchanging inorganic iodine pools in the extra-thyroidal tissue.

## $^{131}\text{I}$ -Triiodothyronine Resin Sponge Uptake Test in Diagnosis of Thyroid Disorders (IV)

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The result of  $^{131}\text{I}$ -T<sub>3</sub> RSU test on patients with various thyroid disorders treated at the thyroid clinic of Okubo Hospital in the past 4 years is reported.

1) The average and standard deviation of

$^{131}\text{I}$ -T<sub>3</sub> RSU were  $31.6 \pm 4.5\%$  in 245 normal subjects ( $32.9 \pm 3.9\%$  in 57 men and  $31.2 \pm 4.5\%$  in 188 women),  $54.1 \pm 7.5\%$  in 224 thyrotoxic patients,  $22.3 \pm 2.0\%$  in 22 hypothyroid patients,  $30.9 \pm 4.0\%$  in 127 patients

with diffuse goiter,  $30.9 \pm 4.0\%$  in 98 patients with nodular goiter,  $31.6 \pm 3.7\%$  in 16 patients with malignant goiter,  $38.8 \pm 11.5\%$  in 9 patients with subacute thyroiditis,  $29.8 \pm 6.2\%$  in 40 patients with chronic thyroiditis.

2) By statistical analysis of the values in 245 normal and 244 hyperthyroid subjects, 40% was found to be the best value as the upper limit of normal.

3) In thyrotoxic patients who were successfully treated with a single administration of the therapeutic dose of  $^{131}\text{I}$ , changes of  $^{131}\text{I}$ -T<sub>3</sub> values after therapy showed one of the following five patterns: i) The RSU value became normal within a few months after therapy and remained normal thereafter. This pattern was seen in 48 (46%) cases. ii) Several months after therapy, the RSU value went down into the hypothyroid range (below 25%) for a while and then returned to normal. This pattern was seen in 32 (31%) cases. iii) The RSU value became normal within several months after therapy, then went up to remain around the upper limit of normal for a few years before becoming normal again. This was seen in 12 (11%) cases. iv) The RSU value became within several months after therapy but then went up and continued to show values around the upper limit of normal (40%) for a long time even though the patient remained clinically euthyroid. This was seen in 7 (6.5%) cases. v) The RSU value went down below

25% several months after therapy and remained at the values around the lower limit of normal for a long time thereafter even though the patient did not show signs of hypothyroidism. This was seen in 5 (4.7%) cases.

In 3 cases (2.8%) the RSU value became below 25% several months after therapy and continued to show subnormal values as the patient began to show signs of hypothyroidism.

4) In the patients who did not become euthyroid after the initial dose of  $^{131}\text{I}$ , the changes of RSU values after treatment showed one of the following three patterns: i) in 13 cases (59.0%), the RSU value remained high and never became normal after the initial dose of  $^{131}\text{I}$ ; ii) In 8 cases (36.4%), the RSU value was normal for a while several months after administration of  $^{131}\text{I}$ , but then exceeded the upper limit of normal again. iii) In 1 case (4.6%), the RSU value became below normal for a while and then went up to above 40% level.

5) The average of  $^{131}\text{I}$ -T<sub>3</sub> values of all the patients treated with  $^{131}\text{I}$  for thyrotoxicosis was 36.0% (in 93 cases), 32.8% (in 75 cases), 30.9% (in 23 cases), 28.2% (in 18 cases), 28.8% (in 24 cases), 27.4% (in 22 cases) at 1, 2, 3, 4-5, 6-7 and 8-10 years respectively after administration of  $^{131}\text{I}$ , and showed a gradual decline with passage of time.

## The Application of 30 Per Cent Correction Method to Triosorb Test ( $^{131}\text{I}$ -Triiodothyronine Resin Sponge Uptake Test)

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It is well known that Triosorb test is a very useful and easy procedure for the determination of thyroid activity. However, this method has an inevitable problem of fluctuating standard values (resin sponge uptake % of standard serum) of each kit. For example, the standard values of 36 packages sent to

us during the term from May 27, 1965 through February 10, 1966 were found in between 29.4% and 34.9%. From this fact, it is obvious that Triosorb values obtained by using the kits having different lot numbers and different standard values must be so corrected that Triosorb values are able to be