was purified by the receptor binding. The receptor (50 mg eq.), purified ¹²³I-TSH and TSH or unknown samples were incubated at 37°C for 60 min. in a final volume of 300 µl. The binding was time and temperature dependent with optimal binding in the above condition. Monovalent cations, such as Na⁺ or Li⁺, inhibited the receptor binding. Addition of Ca⁺⁺ or EDTA also inhibited the binding. Studies of dissociation kinetics and Scatchard plot indicated that there were two classes of the receptors. High affinity constant was $1.5 \times 10^4\text{M}^{-1}$. Binding was inhibited by human, bovine and ovine TSH but was not inhibited by Insulin, HCG (50 IU), FSH-LH (1 IU – 2.5 IU), PGE!!! (2 × $10^{-6}$M), $T_3$ (10⁻³M) and $T_4$ (10⁻²M). Sensitivity was 50 µU/tube and 50% inhibition was observed at 500 µU/tube.

IgG prepared from sera containing high LATS activity completely inhibited the receptor binding of ¹²³I-TSH. On the other hand, some IgG preparations from LATS negative Graves’ sera also inhibited the binding. Therefore this assay system appeared to be useful in evaluating the total thyroid stimulating activity in these sera.

Changes in Thyroxine and Triiodothyronine Concentration in Patients Treated with Radioactive Iodine

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It is well known that many patients treated with radioactive iodine for thyrotoxicosis eventually become hypothyroidism. Several years ago, we researched thyroid function in these patients who had alapsed for many years following¹³¹I treatment and noticed that a resin sponge uptake of ¹³¹I-triiodothyronine decreased in considerable number of them, although no clinical signs and symptoms of hypothyroidism were detected. For explanation of low $T_3$ uptake test in eumetabolic patients after ¹³¹I treatment, either the status of impending hypothyroidism or so-called $T_3$ euthyroidism was considered.

The widespread availability of RIA for measurement of thyroid hormones now enables monitoring the changes in thyroxine and triiodothyronine following ¹³¹I therapy.

Triiodothyronine($T_3$) was measured with radio-immunoassay kit, and its normal value was $136\pm54$ ng/dl. (Mean ± S.D.). Thyroxine ($T_4$) was determined with Res-O-Mat $T_4$ kit, its normal range was $8.9\pm2.8\ \mu$g/dl and normal $T_3/T_4$ ratio was $1.78\pm0.64\ %$.

In three cases, $T_3$, $T_4$ and $T_3/T_4$ ratio were measured before therapy at 2, 4, 6, 8 and 15 days following therapy, and there was no significant change.

In 26 cases of thyrotoxic patients, $T_3$, $T_4$ and $T_3/T_4$ ratio were monitored prior to therapy and monthly after therapy. $T_3$ changed in parallel to $T_4$ and $T_3/T_4$ ratio was influenced by change of $T_3$ than that of $T_4$.

Thyroid hormones were measured in 91 cases who had received ¹³¹I therapy from 1 to 18 years previously and attended to follow-up clinic. Most of them had received 60 µCi. of ¹³¹I per gram of
estimated thyroid weight. With elapse of years after treatment, T₃, T₄ and T₃/T₄ ratio remained within normal limits and there was no rise in T₃ concentration, and therefore no T₃ euthyroidism.

Follow-up of ¹³¹I Therapy of Hyperthyroidism

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The clinical results of 858 patients (139 men and 719 women) with hyperthyroidism, to which ¹³¹I therapy had been conducted, were reported with reference to hypothyroidism after ¹³¹I therapy as follows:

1) ¹³¹I thyroid uptake which is a factor of calculating the ¹³¹I dose was 64.5% on an average, the mean effective half life 5.9 days and the mean thyroid weight 44g.

2) The dose ranging from 7,000 to 8,000 rads was aimed as the absorbed dose in the first half, and the dose ranging from 4,000 to 5,000 rads as the latter half. The initial ¹³¹I doses were 5–6 mCi in the first half and about 4 mCi in the latter half. ¹³¹I were given as once per several months in the first half and once per 6–12 months in the latter half. The numbers of ¹³¹I delivery were about 2 on an average in the first half and 1.2–1.4 in the latter half. The total dose was 7–10 mCi in the first half, and recently it was almost about 5 mCi.

3) ¹³¹I thyroid uptake on therapy was 72% on an average, compared with 65% on pretherapy examination. The effective half life was 5.9 days. The rate of virtual absorbed dose to expected dose was 1.1. In comparison with those two doses in 531 patients, the rate of the only 60% of them ranged from 0.8 to 1.2.

4) Results of ¹³¹I therapy were decided within the patients which had practically been followed up. Five hundred and fifty-three (64%) of 858 patients could be followed up. Of them, 475 (86%) including 3 patients who had completely healed after recurrence were healed. Sixty-three patients were under medical treatment, and eight died.

5) The incidences of hypothyroidism were 1.3% after 1 year, 2.7% after 3 years, 4.1% after 5 years, 13.8% after 10–12 years, 21.5% after 13–14 years and 26.5% after 16–20 years. The incidence of hypothyroidism was gradually increased with the lapse of year.

6) When the normal value of ¹³¹I–T₃ resin uptake (Triosorb method) ranged from 23 to 35%, the result of gradual increase of low ¹³¹I–T₃ resin uptake was almost in accordance with the incidence of the above-mentioned hypothyroidism. When the normal value of TSH ranged from 2 to 8 µU/ml, a high rate of hypothyroidism was indicated as patients of whose values were above 8 µU/ml were 21% after 1–3 years, 51% after 4–9 years, 68% after 10–14 years.