

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}I , changes of ^{131}I - T_3 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}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}I ; ii) In 8 cases (36.4%), the RSU value was normal for a while several months after administration of ^{131}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}I - T_3 values of all the patients treated with ^{131}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}I , and showed a gradual decline with passage of time.

The Application of 30 Per Cent Correction Method to Triosorb Test (^{131}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

compared with one another. Therefore, it will be a matter of course that these different standard values must be adjusted to one specific point that will make universal comparison of Triosorb values possible.

Now, it can be said that the fluctuating standard values are close to the value of 30.0%. This fact probably justifies the use of the value of 30.0% for the specific point where all the standard values should be adjusted.

Then, the following formula is suggested.

$$T_{30} = T \times \frac{30.0}{S} (\%)$$

where T is Triosorb value obtained by the usual manner without considering the variation of the standard values. S is the standard value indicated on the kit used. T_{30} is the corrected Triosorb value obtained by

adjusting the standard value to 30.0%. We call $\frac{30.0}{S}$ "Correction Factor" of each kit. Now, it will be apparent that the universal comparison of Triosorb values are possible by the use of this correction factor.

When 30% correction method was not applied, the distribution of Triosorb values at 2.5% intervals, that was obtained on 228 cases having normally functioning thyroid, was found in between 22.6% and 37.5%, and the average value was 29.3%. Majority (96.1%) of them were found in between 25.1% and 35.0%. When 30% correction method was applied to all the cases mentioned above, however, Triosorb values decreased generally, being found in between 20.1% and 32.5%; and the average value was 27.3%. Majority (97.8%) of them were found in between 22.6% and 32.5%.

An Investigation of Triosorb Test

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Triosorb test can not be used when the serum has radioactivity. We shall be able to get the calculated formula according to study on adsorption of radioactive iodide or radioactive T_3 to resin.

In our experiments by use of ordinary triosorb test, the uptake ratio of ^{131}I , T_3 - ^{131}I and mixture to resin sponge was as follows;

T_3 - ^{131}I	95%
^{131}I	93%
$^{131}\text{I} + T_3$ - ^{131}I	90%
Serum + ^{131}I	82%
Serum + $^{131}\text{I} + T_3$ - ^{131}I	56%

These uptake ratio were not related to the concentration of iodide. Iodide was little bound to serum protein. From the above results, it was indicated that T_3 - ^{131}I which was bound to both serum protein and resin sponge was an important factor.

Then we used PVF which was formal compound of polyvinyl alcohol instead of resin sponge. T_3 - ^{131}I was selectively adsorbed by PVF and ^{131}I was not. It seemed that PVF was useful to triosorb test when the serum

has radioactivity, but we could not get the constant value.

After ^{131}I was added to the euthyroid serum, triosorb test was performed and ordinary formula of triosorb test was corrected by coefficient (0.82) of uptake to resin sponge of ^{131}I . The corrected formula was following;

$$\frac{A - 0.82 \times ^{131}\text{I}}{B - ^{131}\text{I}}$$

A: counts adsorbed to resin sponge

B: counts before incubation

When this value was compared with the value which was calculated with ordinary formula, both was within normal range.

The uptake ratio to resin sponge of radioactivity contained in the serum was 0.12.

Accordingly the corrected formula was following.

$$\frac{A - 0.12S}{B - S} \dots\dots\dots (1)$$

A: counts adsorbed to resin sponge