

A Study on the Change of ^{131}I -T₃ Resin Sponge Uptake after Treatment of Hyperthyroidism with ^{131}I

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During the past 12 years, about 500 patients have been treated with radioiodine and I have been able to follow up the results from 1 to 13 years. There were admittedly some cases, in which hypothyroidism developed after treatment with radioiodine. It is to be noted, however, that in some cases, in which of post treatment of hypothyroidism, the symptoms of thyroidal deficiency developed only after several years had elapsed, during which period the patient remained in an apparent euthyroid state. The frequency of hypothyroidism had increased 2% after 1 year to 20% after 12 years.

The average of resin sponge uptake in cured hyperthyroidism after one year was 33% (140 cases) but thereafter it gradually decreased to 32.3% (120 cases) after 2 years, 29.7% (80 cases) after 3 years, 28.3% (72 cases) after 4~5 years, 28.0% (65 cases) after 6~7 years, 26.2% (60 cases) after 8~10 years and 25.2% (30 cases) after more than 10 years.

The number of cases which showed less than 25%, contrarily increased year by year from 6% after 1 year to 43% after more than ten years with or without hypothyroid state.

I am afraid that most of the cases which

showed less 25% without clinical hypothyroid symptoms, will become hypothyroid before long.

From these results we thought that the 7,000~8,000 rad dose treatment, was too large because it produced 20% incidence of hypothyroidism within twelve years. Presently we believe the optimum dose is about 6,000 rad which should give much less late effects and we sometimes used antithyroid drugs 1 month after radioiodine treatment expecting the late radiation effect.

Meanwhile we found the fact that 55 cases out of 175 cases showed above normal range of resin sponge uptake in 6~18 months after ^{131}I treatment with or without slight reappearance of symptoms of hyperthyroidism.

Formerly we used to treat them again when this resin sponge uptake continued for 6 months to one year taking into consideration clinical symptoms and other laboratory tests. But recently I have recognized the fact that as the period of observation becomes longer, these results become lower gradually after 2 to 3 years without second treatment. From these observations we made an effort to cure them at high level within normal range, so as to lessen the danger of hypothyroidism.

Reevaluation of Triosorb Test and Its Comparison with TBI

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Method:

By utilizing one and the same serum sample, our investigation was carried out in order to detect the degree of variability of the Triosorb

and TBI kit, while the purity of the Tiosorb solution was evaluated, after which the indicated value of the sponge-uptake and that of the standard serum were compared with

each other to derive the error of fluctuation of the former.

In a separate procedure, each of the known values was corrected by the indicated value and the standard serum value; and the correlation between this corrected value and the TBI was obtained.

Result:

The standard deviation of variability of the Triosorb value and the TBI value were ± 0.35 and ± 0.03 alike, our experiment demonstrated.

Also, the purity of the Triosorb solution per se proved to remain unchanged even at the end of the 3rd week of assay.

The variation in the indicated value of the sponge-uptake is so remarkable as to give a standard deviation of ± 2.48 , according to our sponge uptake correction method.

The coefficient of correlation of the TBI value and the Triosorb value, according to the standard serum correction method, was -0.8 .
Summary:

In our experiment, it is demonstrated that the purity of the Triosorb kit and the variability of the kits per se offer no essential problem except that a considerable degree of variability is seen in the sponge-uptake value indicated.

Accordingly, different correction procedures are nowadays employed in major clinical laboratories of hospitals or biochemical institutes.

It is desirable, therefore, that the producer of these kits should place emphasis on eliminating the variability of the Triosorb kits.

Comparative Study between TBI Method (Mallinckrort Company) and T₃ Method (Triosorb Test) in the Field of Obstetrics and Gynecology

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1. Clinical Application of ¹³¹I-Triiodothyronine Resin Sponge Uptake Test (Triosorb test) in the field of Obstetrics Gynecology was already reported by us 1966 (*Acta Radiologica Japonica* 25, 5, 346-358). In this Literature, the mean value of T₃ test of the serum with the 94 normal pregnant women shows

significantly low.

2. Comparative Study between TBI method and F3 method was performed with the same serum of the 89 pregnant women. The value of TBI method are not only stable but significantly no difference to the serum of normal non-pregnant women.

Studies on the Methods of Separation of Protein-Bound ACTH and Free ACTH in Radioimmunoassay

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Mathematical analysis of the dynamic equilibrium between a hormone and its binding protein suggests that the standard curve

of radioimmunoassay of the hormone is a hyperbola. From this point of view, only hydrodynamic paper electrophoresis (PEP)