

VII. Endocrine Organs

Clinical Evaluation of a New Diagnostic Test "Res-O-Mat T-3" for thyroid function

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The Res-O-Mat T-3 (Mallinckrodt Chemical Works) which is to determine the T-3 binding capacity of serum, was examined as a diagnostic test for thyroid function in 50 cases.

T-3 binding capacity index (TBC index) in hyperthyroid, hypothyroid and euthyroid patients were determined. The thyroid function was decided on the basis of clinical findings, ^{131}I -uptake, BMR and total serum cholesterol.

TBC index was obtained at every thirty minutes for 3 hours and it was found that the index value decreased gradually in hyperthyroid and increased in hypothyroid serum as the incubation times was prolonged, on the other hand in euthyroid the index invariably kept the value obtained in first 30 minutes of the incubation.

The TBC index was also found to have good proportion with the T-3 resine sponge uptake (T-3 RSU).

Principle of the Res-O-Mat T-3 test is of course the same as the T-3 RSU, therefore the advantages of the new diagnostic method of thyroid function over the conventional T-3 RSU test are very simple and convenient technically in daily practice. That is, the former can be performed at room temperature and with less serum (0.5 ml) and does not need washing procedure of the resine. In addition, the slight difference (several minutes) of incubation period does not seem to influence upon the result of the TBC index.

In our preliminary study the difference of the TBC index was not observed when the incubation temperature was at 37°C and 24°C.

An Experience with Re-s-O-Mat T_3 Kit and Correlation between the Tetrasorb method, Triosorb method and the Re-s-O-Mat T_3 test

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Purpose and method

The Re-s-O-Mat T_3 is an in-vitro diagnostic test used for determining the T_3 binding capacity of serum. We not only performed some fundamental tests on Re-s-O-Mat T_3 but examined the correlation between the Triosorb test and

the Tetrasorb Test and the Re-s-O-Mat T_3 test.

Results

The variability of radioactivity in each vial was found almost without problem. TBC-

Index or by equipment that provides a direct read-out of ratio of two counts may be used, is 0.06. As far as the test was performed within normal room temperature and limited 2 hours of rotation time, the interpretation of the result was not problematic. Utilizing Monitrol I, a linear equation was derived, signifying the relationship between serum volume and serum uptake, which procedure required fairly accurate pipetting.

Effective adsorption capacity of resin strip indicated 95.7% at assay time, 40 days later there was hardly difference.

Normal ranges of value obtained in our laboratory was as follows:

Euthyroid	(1.016 \pm 0.071)
Hyperthyroid	(0.739 \pm 0.086)
Hypothyroid	(1.146 \pm 0.055)

Correlation factor between Re-s-O-Mat T₃ test and Triosorb test was -0.92, by which we found the correlation of the above tests were fairly extensive. So was the correlation between Re-s-O-Mat T₃ and Tetrasorb.

Re-s-O-Mat T₃ procedure is not only a simple and convenient test of choice, also an accurate procedure in detecting thyroid disorders. From our study, its high availability was acknowledged.

The Use of the Res-O-Mat T-3 Kit as a Diagnostic Test of Thyroid Function

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The Res-O-Mat T-3 Kit is an in vitro l-triiodothyronine ¹³¹I diagnostic kit used for the serum T-3 binding capacity determination. An index of this binding capacity may be comparing the quantity of T-3 bound by the patient sera to that bound by standard sera.

We determined the T-3 binding capacity index (TBC Index) in normal subjects and thyroid disease and examined fundamental studies of this diagnostic kit. Determinations were made in 56 cases.

TBC Index in 15 cases of normal subjects were from 0.86 to 1.1, with a mean average of 0.981. In 21 cases of hyperthyroidal patients, TBC Index ranged from 0.62 to 0.9, average 0.752. In 4 cases of hypothyroidal patients, the values were from 1.13 to 1.39, average 1.215. In 14 cases of non toxic goiter, TBC Index were from 0.83 to 1.07, average 0.959.

In 2 cases of Thyroiditis subacuta, TBC Index were from 1.05 to 1.12, average 1.085.

Comparative examination of the serial standard sera to normal human sera was approximately defined, with a range 0.941 to 1.002.

In various incubation time—30, 60, 90, 120 min.—, TBC Index seemed to decline as pass as the time. But we found very nearly the value of 90 and 120 min.. When incubation temperature was examined in 10 and 24°C, TBC Index increased in high temperature.

Our clinical experiences revealed that this test, being performed in vitro, avoids the administration of radioactivity to the patient. It can be simply and rapidly and possesses a comparatively high diagnostic accuracy.

In basic procedure, 2 hours rotating incubation time take the greater parts of the time in this technique. So we attempt to simplify this basic method.