

¹³¹I-T Resin Sponge Uptake Test Using Cold Incubation

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It has been well known that the T_3 resin uptake test is one of the useful parameters of thyroid-function status. Since the binding of ^{131}I labelled T_3 with serum protein is significantly dependent upon temperature and time of incubation, it must always be kept in mind that the temperature and the time for incubation are exactly constant. Any alteration from the once settled test conditions as to incubation time and temperature requires an application of correction factors to the obtained results. These factors vary with the status of thyroid function in each test sample, which makes the correction very complicated. We attempted, therefore, to establish a method which eliminates these factors of complication from the T_3 resin uptake test.

The sera of each status of thyroid function, i.e., hyperthyroidism, euthyroidism, and hypothyroidism were separately pooled. The each pooled sera were incubated with T_3 resin sponge either in a cold room at 2°C , 5°C , or 8°C , in a refrigerator adjusted to 5°C , or in an incubator at 25°C . The cold incubation was carried out for 20, 24 and 28 hours, while the warm incubation at 25°C , was done for 1 hour.

In the cases of cold incubation for 24 hours, the T_3 uptake values in each pooled sera were not affected by the difference in temperature (in cold room at 2°C , 5°C , and 8°C , and in refrigerator adjusted to 5°C). This temperature independence was also observed for different incubation time of 20 and 28 hours.

The T_3 uptake was found to be in linear function of incubation time, in which the linearity was parallel for each pooled sera of three classifications. The difference of uptake in 20 and 28 hours incubation was only two to three per cent in each sample representing different status of thyroid function. A definite correlation was ascertained to exist between the uptake values obtained by the conventional method and the ones by the present method in about seventy cases of thyroidal disorders examined. The difference of the uptake value between hyperthyroidism and hypothyroidism was 28 per cent in the conventional method for 1 hour incubation at 25°C , while it increased to 36 per cent in the cold incubation for 24 hours.

The merits of the present method over the conventional method are as follows.

1) It almost eliminates the correction with regard to temperature and time of incubation. No temperature correction is required if the incubation is carried out in a refrigerator adjusted at 5°C . Alteration of incubation period from 24 hours by one or two hours does not require time correction.

2) The time correction factor, when necessary, remains same for the different status of thyroid function.

3) The difference of uptake values between hypothyroidism and hyperthyroidism becomes greater, and hence the large utility of the present method for the grading or classification of thyroidal disorders.