

Evaluation of Direct Saturation Analysis Using Radioactive Triiodothyronine

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Four methods of direct saturation analysis using radioactive triiodothyronine, (a) Thyopac-3, (b) Res-O-Mat T₃, (c) Trilute and (d) Triosorb test were evaluated.

In (a), radioactivity in the supernatant reached plateau after incubation for 10 min. During incubation, the temperature (22 and 30°C) and the rotation speed (13 and 50 r.p.m.) had no effects on T₃ value.

In (b), incubation time and temperature had a slight effect on T₃ index (0.005/5 min and 0.008/1°C respectively).

In (c), the retention % did not change

with different eluting speed (3-8 min) but increased at the higher temperature.

The values in normal subjects, hyperthyroid and hypothyroid patients were (a) 84-124, 58-92, 102-148, (b) 0.87-1.05, 0.59-0.89, 0.94-1.38 (c) 31.2-62.2%, 62.4-81.6%, 20.8-35.2% and (d) 26-39%.

There were higher correlations between (a) and (d), (b) and (d) and (c) and (d). The standard deviations of duplicates were (a) 1.1-1.3 and (b) 0.014-0.047. Coefficients of variations were (a) 2.4% (b) 4.2% and (d) 4.7%.

Comparative Investigation by the Measurement Method of Thyroxine in Blood by Protein Binding Capacity

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A comparative investigation was carried out concerning the measurement of thyroxine in blood of the same patients by using Tetrasorb method and simpler Resomat-T₄ method.

1) A comparative investigation was made regarding the measurement results by both two methods, in 135 euthyroid cases, 102 cases of hyperthyroidism, 18 cases of hypothyroidism, and 124 cases with other diseases of the thyroid gland. In case of euthyroid, Tetrasorb method showed 9.5 ± 2.2 $\mu\text{g}/\text{dl}$, and Resomat-T₄ method 9.0 ± 2.0 $\mu\text{g}/\text{dl}$. In case of hyperthyroidism, the former method revealed 23.9 ± 5.8 $\mu\text{g}/\text{dl}$, and the latter 20.7 ± 5.9 $\mu\text{g}/\text{dl}$. The cases of hypothyroidism indicated 2.2 ± 1.2 $\mu\text{g}/\text{dl}$ by Tetrasorb method, and 2.4 ± 1.2 $\mu\text{g}/\text{dl}$ by

Resomat-T₄ method. The results of both two methods were almost similar. It was estimated that Resomat method had a tendency to indicate lower value than that of Tetrasorb method.

2) When the normal values were assumed to range from 5 to 15 $\mu\text{g}/\text{dl}$ by Tetrasorb method and also from 5 to 14 $\mu\text{g}/\text{dl}$ by Resomat method, the former method showed 95%, and the latter 96% in the range of this value in 135 euthyroid cases. The distribution by both methods was about the same around 9-10 $\mu\text{g}/\text{dl}$ by both two methods. In case of 102 hyperthyroidism cases, 95% showed more than 15 $\mu\text{g}/\text{dl}$ by Tetrasorb method, and 94% did more than 14 $\mu\text{g}/\text{dl}$ by Resomat method.