

It is, therefore, necessary to make a more detailed instruction for each kit. The accuracy

of the determination in each kit should be more emphasized than the technical simplicity.

In Vitro Determinations of Serum Thyroid Hormones, Thyroid Stimulating Hormone and Binding Capacity of Thyroxine-Binding Proteins and Their Clinical Applications

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Serum triiodothyronine (T_3) and thyroxine (T_4) were measured by radioimmunoassay method. Binding capacities of T_4 -binding globulin (TBG) and T_4 -binding prealbumin (TBPA) were measured by the method of Tanaka and Starr and polyacrylamide gel electrophoresis. Serum TSH was measured by the double-antibody radioimmunoassay method. Serum protein-bound and free ^{125}I - T_4 and ^{125}I - T_3 were separated with sephadex G-25 column chromatography. Ratio of the net count of free and protein-bound ^{125}I - T_4 or ^{125}I - T_3 was determined as percent free T_3 or T_4 . Serum free T_4 or T_3 values was calculated by multiplying the serum total and percent of free T_4 or T_3 .

Both binding capacities of TBG and TBPA were decreased in hyperthyroidism and increased in hypothyroidism. These values became normal ones by the treatment with antithyroid drugs, ^{131}I and thyroid hormones. Binding capacity of TBPA in a patients of decreased TBG was inclined to be higher than normal value.

Serum total T_4 and T_3 values of TBG-deficient patients were higher than normal

ones, but free T_4 and T_3 values of them were normal.

When 0.24 mg of ethinylestradiol-3-methyl ester was administered orally for 14 days to a TBG-deficient patient, binding capacity of TBG unchanged.

In 15 cases of breast cancer, mean basal serum TSH value was significantly higher than normal one and overreacted to the stimulation of $500\mu\text{g}$ of TRH administered intravenously.

Mean normal value of urinary T_3 measured by radioimmunoassay was 0.59 ± 0.28 (S.D.) $\mu\text{g}/24$ hrs. T_3 -clearance rate in hyperthyroidism calculated from serum free T_3 , urinary T_3 and urinary volume was higher than normal one.

Urinary T_4 was extracted by column chromatography of Dowex 50 W and measured by Tetrasorb Kit (Abbott Co.). Mean normal T_4 value was 9.8 ± 0.56 (S.D.) $\mu\text{g}/24$ hrs. T_4 -clearance rate in hyperthyroidism calculated from serum free T_4 , urinary T_4 and urinary volume was lower than normal one.