INVESTIGATION ON THYROID FUNCTION ASSAY BY GAMMA-COAT SOLID-PHASE RADIOIMMUNOASSAY

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Many different types of kits for thyroid function assay have been developed;and their simplicity of assay procedure and assay accuracy also have been improved promptly. In solid phase RIA system using antibody coated tube, there is no need for specific reagent to separate B and F fractions. Thus the system has several advantages over other methods. They are shorter assay time,better sensitivity,and easy adaptation to automization. After making some basic investigations for above points on GammaCoat T4,T3 and T3 uptake,we,now,would like to present the report. [Method] As to GammaCoat T4, 10ul of patient sample is used;and its incubation time and temperature are 45mins and room temperature. As to GammaCoat T3 uptake,25ul of patient sample is used;and the incubation of 60 mins at room temperature is made. As to GammaCoat T3,100ul of patient sample is used;and the incubation of 60 mins at 37°C is made. Micromedic automatic pipetting station is used for sample pipetting for above three assays;and personal computer is used for data processing according to Drs Miyai and Ichihara's method. [Results] (1)Intraassay variations(c.v.%) for GammaCoat T4 are 5.6 and 3.0. Those for GammaCoat T3 uptake are 3.2 and 4.5. And Those for GammaCoat T3 are 6.9 and 8.6. (2)Correlation coefficient of GammaCoat T4 with Tetrasorb is 0.97 and that with T4 RIA(PEG) is 0.98. That of GammaCoat T3 uptake with Triosorb is 0.92. That of GammaCoat T3 with T3 RIA kit II is 0.94. They,all,correlate extremely well. (3)The effects of medium-level hemolysis on those three methods are not significantly high. (4)The effects of lipid on T4 value by GammaCoat method and that on CPBA method are significantly different in the case of high value of FFA. CPBA is rather easily affected by addition of lipid acid in in-vitro assay. (5)T4 values by GammaCoat for euthyroid,hyper-,and hypo-thyroidism are 7.4±1.2(n=34),18.3±7.0(n=30),and 3.3±1.5(n=8) ug/dl. T3 uptake values by GammaCoat for those three are 39.2±2.4(n=32),46.3±6.7(n=26),and 36.5±2.5 (n=8) respectively. [Summary] GammaCoat T4,T3,and T3 uptake kits are extremely useful because of its simplicity and feasibility of mass routine assay by utilization of automatic pipettor. Moreover, those assay values correlate with those by presently available methods. Thus they are clinically significant kits.

SOLID PHASE RADIOIMMUNOASSAY KIT FOR SERUM T_4 AND T_3 - UPTAKE RATIO

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Ability for measurement of serum T_3 uptake ratio with SPAC T_3 kit and of serum T_4 with SPAC T_4 kit manufactured by Mallinckrodt Company was tested.

Principle of SPAC T_3 kit is that unbound T_3 to serum TBG is separated by coupling to anti-T_3 coated on inner surface of test tube. Effect of incubation temperaturewas tested at 4, 20 and 37°C.

The value became higher as temperature increased. To test effect of incubation time, the index was measured for 5, 10, 30 and 60 minutes. The value increased as the time was longer. Reproducibility was tested using 7 different serum samples measured on 2 or 4 different assays, and average coefficient of variation was 7.5%. Then relationship of the values by this method and Triosorb was tested using plasma samples of 83 patients with various disorders, and statistically significant positive correlation ($r=0.76$, $p<0.01$) was observed.

Principle of SPAC T_4 kit is that free T competitively binds to anti-T_4 coated on test tube under condition of blocking binding capacity of TBG with ANS. The effect of incubation time was tested incubating sera of three different level of T_4 for 10, 30, 60 and 90 minutes. T_4 values decreased rather sharply for until appoximately 60 minutes and then decreased gradually. A nearly linear curve was obtained by measurement of serially diluted serum with known amount of T_4 .

Reproducibility of values was tested using four different sera on 2 or 4 assays. Average coefficient of variation was 6.4%.

Finally relationship was test between the values measured by this method and RESOMAT T_4 .

Corellation of coefficient was 0.89 ($n=101$, $p<0.01$).

These results indicate that SPAC T_3 and T_4 are pretty reliable and accurate kits for clinlcal use.