

54

COMPARATIVE STUDIES ON COMMERCIAL RADIOASSAY KITS OF THYROXINE-BINDING GLOBULIN. S.Fujita, K.Togashi, S.Hirata and S.Sato. Kitasato Biochemical Laboratories (Bristol Myers). Kanagawa

Serum thyroxine-binding globulin (TBG) is the major binding protein of thyroid hormones. Although thyroxine-binding capacity has been employed by the radio metric electrophoresis as a diagnostic test, current development in RIA makes it possible to determine the TBG concentration in serum directly. In this connection, the comparison of three commercial radioassay kits from TBG distributing by Behringwerke CEA-IRE-SORIN (CIS) and Corning Medical Co. were performed. The following evaluation was obtained in this study: 1) Reproducibility of each kit was satisfactorily acceptable to be ranged from 8.0 to 12.0% (C.V.) as a Within assay variation, and from 6.0 to 8.0% (C.V.) as a between assay variation. 2) Excellent result were obtained from both the dilution and recovery test of all kits. 3) The mean TBG concentration determined by each kit, Behringwerke CIS Corning were as follows; 26.5, 26.1 and 18.3 $\mu\text{g/ml}$ for 19 normal subjects, 49.0, 46.9 and 35.8 $\mu\text{g/ml}$ for 10 pregnant women, 2.5, 3.4 and 2.5 $\mu\text{g/ml}$ for 5 TBG deficiency, 20.2, 20.5 and 16.9 $\mu\text{g/ml}$ for 14 hyperthyroid patients and 24.5, 24.3 and 23.5 $\mu\text{g/ml}$ for 13 hypothyroid patients. When Corning kit was suppressed reversibly by the addition of thyroxine (T_4) into the serum to be obtained. From the precision study described above, it is shown that the Behringwerke kit seem to be suitable for routine test in the laboratory.

56

RADIOIMMUNOASSAY FOR SERUM FREE THYROXINE BY ANTIBODY-COATED TEST-TUBE METHOD: FUNDAMENTALS AND ITS CLINICAL ASSESSMENT. R. Imamura, T. Nakazaki, A. Ishihara, Y. Yoshimasa and S. Hamada. Tenri Hospital, Tenri.

Free thyroxine (FT_4) concentrations in sera from various diseases were determined by GammaCoat Free T_4 RIA kits, and the values obtained were compared with those by equilibrium dialysis method and by free T_4 index ($T_4 \times T_3U$). FT_4 values by the kits were increased in hyperthyroidism (5.32 ± 2.54 (S.D.) ng/dl) and decreased in hypothyroidism (0.66 ± 0.43), showing no overlap with normal subjects (1.21 ± 0.33), while they remained within the normal range in pregnancy and a case of congenital TBG deficiency. These values were directly proportional to those by the equilibrium dialysis ($r=0.91$, $Y=0.53X + 0.21$), but were nonlinear to those for FT_4 index ($r=0.91$, $Y=1.11 + 6.40X - 0.39X^2$). The simple, rapid test appeared useful for clinical purpose, since it provides a good approximation for serum free T_4 .

55

ABOUT CLINICAL MEANING OF TBG DENSITY IN THYROID FUNCTION MEASUREMENT. T.Nomoto, M. Satoh, Y.Yamagishi. Clinical Radiology, Tokyo Electric College. Clinical Laboratory, National Yokosuka Hospital. Clinical Radiology, Nippon Medical School. Tokyo and Yokosuka.

Mainly thyroxine combine with TBG TBPA Albumin. It has a very strong combination with TBG. Therefore, the case as TBG density take with abnormality has an effect on thyroxine value. Then because we used TBG kit which was developed this time, and examined about the effects of thyroid function test value by protein density and clinical meaning, we report on it. We used single antibody cellulose solid phase method and did them by thirty of healthy and normal men, fifteen example of hyperthyroidism, fifteen example of hypothyroidism, nineteen example of high and low patients of albumin-globulin in protein function and five example of pregnant women. Then as measure protein binding iodine. We can say that is very significant to command TBG value.

57

COMPARISON OF TBG CONCENTRATION MEASURED BY RADIOIMMUNOASSAY WITH THE MAXIMAL BINDING CAPACITY OF TBG. K. Naito, M. Nishikawa, H. Ishii, K. Tanaka, M. Inada and H. Imura. 2nd. Division, Department of Internal Medicine, Kyoto University School of Medicine, Kyoto, Japan.

Serum TBG concentrations were measured by radioimmunoassay kit (Behringwerke Radiochemical Laboratory, W. Germany). The maximal binding capacity of TBG (TBG capacity) was determined by reverse flow paper electrophoresis with the glycine acetate system at pH 8.6. Values for TBG concentrations in serum averaged 2.7 ± 0.4 (SD) mg/100ml in 9 euthyroid subjects. Patients with hyperthyroidism had slightly diminished TBG (2.0 ± 0.6 mg/100ml), while it was slightly elevated in patients with hypothyroidism (3.2 ± 0.7 mg/100ml). Marked elevations in TBG concentrations were found in 2 euthyroid subjects (4.6 and 4.8 mg/100ml) with elevated T_4 values and low T_3 resin uptake values. TBG concentration in the patient with low T_4 value and elevated T_3 resin uptake was undetectable. A striking correlation was found between TBG concentrations and TBG capacity ($r=+0.9$). By the method of least squares, the relation was expressed by the following formula: $y=9.17x+0.02$. Therefore, T_4 amount bound by 1 mg TBG was considered to be $9.17 \mu\text{g}$. On the other hand, T_4 amount bound by 1 mg TBG has been theoretically considered to be 13.6 to $21.1 \mu\text{g}$, when it was calculated from molecular weight of TBG (36,500–57,000) and TBG capacity ($20 \mu\text{g/100ml}$). Thus, the findings suggest that TBG concentrations in serum, measured by the present radioimmunoassay kit, might be overestimated, because of the impurity of TBG used in the kit.