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FUNDAMENTAL AND CLINICAL EVALUATION OF FREE T4 RADIOASSAY KIT. S.Bito.H.Ito.Y.Morimoto. N.Oshiro,N.Tamaki,T.Ishihara,and T.Mori. RI Department and Internal Medicine, Kobe Central Municipal Hospital. Kobe.

Usefulness of free T4 radioassay kit (Gamma Coat) were evaluated. This solid phase system was found to bind not only free T4 but considerable part (9.4— 17.7%) of total T4. The 2nd step of incubation was direct saturation analysis by I-125-T4, and standard curves were contructed by B/Bo % v.s. known free T4 concentration of the standard sera. Intra- and inter-assay variabilities were 4.8 % to 14.8 %, and 12.8 to 28.6 %, respectively. Dilution test using '0' standard serum, which had 0 μg/dl T4 and 20.9 μg/dl TBG, showed almost linear regression, however, over estimation by TBG excess and under estimation by TBG deficiency were encountered. Similar results were obtained by recovery test also. Clinically, measured free T4 in 29 normal subjects gave mean value of 1.24±0.36 (s.d.). Untreated Graves' patients had values exceeding 2.45, and hypothyroid patients had values less than 0.42, respectively. Most of euthyroid cases with TBG abnormalities showed normal distribution except for 1 case of 7.5 μg/dl TBG showing 0.51. Mesured free T4 showed a good correlation (r=0.899) with calculated free T4 index. In conclusion, free T4 radioassay kit was considered quite useful clinically, even though it had some problems fundamentally.

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FUNDAMENTAL AND CLINICAL EVALUATION OF THE MEASUREMENT FOR SERUM FREE THYROXINE CONCENTRATION WITH RADIOIMMUNOASSAY KIT. B.BAN,M. HASHEGAWA,T.OKI,Y.AWAYA.H.KIMURA,T.INOUE,T. KOJIMA and S.IINO. Division of endocrinology and Metabolism, Depart.Int.Med. Showa Un. Fugigaoka Hospital. Yokohama.

The fundamental and clinical evaluation of GammaCoat FT4 which determines serum free thyroxine(FT4) was performed in this study. The standard cuve covered the range between 0.2 and 9.5ng/dl. The coefficients of variation for intraassay were from 4.4 to 10.3% and those for interassay were from 4.3 to 15.2%, respectively. The recovery of FT4 for dilution of the serum with high concentration of FT4 was 130%, and the cross reactivity for T4 and T3 were 100% and 5%, respectively. The coefficients of correlation between FT4 and FT4I(Thyrotest3 X Thyopac4/100), FT4 and T4 or FT4 and T3(RIA) were r=0.87 9, 0.892 and 0.735, respectively. The mean serum FT4 concentration(mean±SD) were 1.62± 0.33ng/dl for normal subjects(84 cases) and 1.48±0.25ng/dl for normal pregnant women(75 cases), respectively. The ranges or values of FT4 were 2.7ng/dl and more for the patients with Graves' disease(35 cases),0.36ng /dl and less for those with hypothyroidism (8 cases), between 1.06 and 2.40ng/dl for those with chronic thyroiditis, between 1.91 and 8.05ng/dl for those with subacute thyroiditis, 0.48 and 0.54ng/dl for those with TBG deficiency, respectively. These data indicate that FT4 value well reflected the thyroid function.

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FREE THYROXINE MEASUREMENT WITH RADIOIMMUNOASSAY. T.Nakagawa,K.Kawarada,M.Taguchi and N.Shinoda. Department of Radiology, Mie University School of Medicine and Central Clinical Division of Radiology, Mie University Hospital. Tsu, Mie.

GammaCoat Free T_4 Radioimmunoassay Kit was validated for the method and clinical results. Per cent free T_4 bound by coated tube as measured with I-125-T_4 labeled sera was much more than the one obtained by dialysis, increasing in hypothyroidism and decreasing in hyperthyroidism. Absolute free T_4 bound by tube estimated from the product of total T_4 by the per cent free T_4 was increased in hyperthyroidism and decreased in hypothyroidism, but not exactly proportional to the one by dialysis. This absolute free T_4 bound by tube is measured with competitive binding radioassay and bound fraction is refered to the standard curve which is labeled with real free T_4 value. Free T_4 values did not exactly fall linearly with dilution with hormone-free serum, especially in hyperthyroid sera. This result is explainable by the difference in unoccupied TBG concentration between hyperthyroid sera and hormone-free serum. Free T4 concentration measured with different volume of 10μl to 100μl of samples remained constant. These results support that free T_4 measured with this kit is valid obeying mass law equations.

Normal value for free T_4 ranged 1.1 ± 0.2 ng/dl (mean+SD). There was a good correlation (r = 0.984) between free T4 values as measured with dialysis and radioimmunoassay.

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EVALUATION OF SOLID-PHASE RADIOIMMUNOASSAY FOR FREE THYROXINE. Y.Iida,T.Kosaka,K. Kasagi,K.Ikekubo,J.Konishi and K.Torizuka. Kyoto University School of Medicine. Kyoto.

A solid-phase radioimmunoassay (RIA) for the serum free thyroxine (FT_4), GammaCoat kit, was evaluated for its clinical usefulness. Coefficients of variation for 3 control sera were 6.5-7.1% (intraassay) and 7.1-12.5% (interassay). The percentage cross-reactivity of T_3 to the anti-T_4 antibody was 3.1%. Dilution of high FT_4 sera using a T_4-free serum with equivalent TBG concentration gave linear relationship. Time course of T_4 binding to the antibody was parallel in 2 euthyroid sera with high or low TBG concentrations. The normal range was 0.9-2.1 ng/dl as determined on 26 healthy adults. Serum FT_4 was increased in all 32 hyperthyroid and decreased in all 18 hypothyroid patients. It was normal in 14 pregnant women and 4 subjects with TBG deficiency, although free T_4 index (FT_4I) was low normal or low in these cases. In patients with liver cirrhosis (12) and chronic renal failure (9) FT_4I was low, and it was high in 2 of 7 patients with acute hepatitis. Except 5 cases of chronic renal failure, FT_4 was normal in these patients. Correlation of GammaCoat FT_4 with FT_4I (r=0.90) and with Immophase FT_4 (r=0.92) was good. Excellent correlation was observed between FT_4 (RIA) and FT_4 by equilibrium dialysis (r=0.98) in 18 subjects studied. Measurement of FT_4 by RIA was rapid and reproducible, and in conditions where TBG varies it more accurately reflected thyroid status than did the FT_4I.