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FUNDAMENTAL AND CLINICAL EVALUATION OF SERUM FREE TRIIODOTHYRONINE (T₃) RADIOIMMUNOASSAY. M. Suehiro, A. Nishikawa, J. Ishimura, M. Fukuchi and K. Nagai. Division of Nuclear Medicine RI Center, Hyogo College of Medicine. Nishinomiya.

The free thyroid hormone fraction is considered to exert the main influence on metabolic control. The free fraction of T₄ have been widely measured by radioimmunoassay system in clinical cases. In this study, we evaluated a serum free T₃ radioimmunoassay system namely Amerlex Free T₃ RIA kit for clinical determining serum free fraction of T₃. The specificity of this system shows a minimal cross-react with L-thyroxine by 0.3% or less. The sensitivity of this system is about 0.4 pmol/L. The dilution tests obtained almost desired values. The precision in the performance data (C.V.) were 5.9-9.3% in within-run and 5.3-6.9% in run-to-run. Correlation coefficient between serum free T₃ (y) and serum free T₄ (x) was shows as follows; n=13, r=+0.92, y=3.70x+1.38. However, correlation coefficient shows a tendency to dissociation in higher free T₃ concentration area. The serum free T₃ concentration in normal subjects was 5.19 pmol/L (mean) and similar results was obtained in pregnant women and patients with TBG deficiency. The value of patients with hyperthyroidism was significant higher than those of normal subjects. In addition, the serum free T₃ concentration of patients with hypothyroidism was significant lower than those of normal subjects.

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EVALUATION OF SERUM FREE T₃ LEVELS USING A RADIOIMMUNOASSAY KIT. N. Sekita, K. Okano, Y. Yamada, S. Kou, C. Nawa, Y. Onodera, R. Chida, D. Tsujino, K. Someya. St. Marianna University School of Medicine. Kawasaki. Y. Sasaki. Toho University School of Medicine. Tokyo.

Serum free T₃ (F-T₃) levels were measured by IMMO PHASE F-T₃ RIA KIT (Corning). The F-T₃ assay employs a two-tube procedure which was consisted of tube A for F-T₃ and tube B containing ANS for T-T₃. After the 20 minute incubation at room temperature, T₃ antiserum solution was added into each tube. After the 60 minute incubation, each tube was centrifuged and decanted for counting.

Within assay error was 4.53 ± 0.36 pg/ml (mean \pm S.D., C.V. 5.5%). Between assay errors using two different concentrations were 1.19 ± 0.16 pg/ml (C.V. 13.4%) and 5.44 ± 0.36 pg/ml (C.V. 6.6%), respectively. Recovery test of F-T₃ was 107.7%. Serum F-T₃ levels in 40 normal subjects were 4.62 ± 1.39 pg/ml (male 5.09 ± 1.29 pg/ml, female 4.29 ± 1.38 pg/ml), 18.28 ± 3.69 pg/ml in 10 untreated hyperthyroidism, 1.33 ± 1.73 pg/ml in 6 untreated hypothyroidism, 10.49 ± 4.41 pg/ml in 10 successfully treated hyperthyroidism, 8.30 ± 5.66 pg/ml in 10 successfully treated hypothyroidism. Serum F-T₃ levels were also determined in pregnancy, liver cirrhosis and renal failure.

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RADIOIMMUNOASSAY OF SERUM FREE T₃ CONCENTRATION IN THYROIDAL AND NONTHYROIDAL ILLNESSES. K. Hagiwara, H. Taguchi, and N. Konno. Hokkaido Central Hospital for Social Health Insurance, Sapporo.

We evaluated Immophase RIA kit (Corning Medical and Scientific, Medfield) for determination of serum free T₃ (FT₃) and the results were compared with those by equilibrium dialysis method (ED). The RIA employs the ratio of labeled T₃ bound to antibody in the "A" tube to the total counts (A/TC) and A/TC x T₃ was used as an indicator for FT₃. The A/TC significantly related to %FT₃ in TBG abnormalities and nonthyroidal illnesses (NTI) (r=0.869, n=49, p<0.001), but not in different thyroidal status (r=-0.219, n=58, NS). When T₃ (0.0077-77nmol/L) was added to normal sera, %FT₃ remained unchanged, whereas A/TC decreased as the T₃ more than 7nmol/L was added. There was a reciprocal relation between TBG and A/TC (r=0.675, n=232, p<0.001). The relation between FT₃ by ED (x) and by RIA (Y) was excellent (r=0.928, n=232, p<0.001), but the relation was quadratic (y=0.92+0.93x-0.0055x²). The normal ranges (mean \pm 2S.D.) for FT₃ were 2.7-5.6pmol/L by ED and 2.7-8.4pmol/L by RIA. The FT₃ by RIA agreed well with that by ED in various thyroidal status and in patients with low or high TBG levels, but FT₃ by RIA yielded a falsely lower values than those by ED in NTI with low serum T₃. These results indicate that the RIA for FT₃ is a rapid and reliable method for quantifying FT₃ levels in TBG abnormalities as well as in hyper- and hypothyroidism, although the FT₃ by RIA tends to be lower as the T₃ level in serum increases, presumably because of large T₃ pool of antibody in this RIA system. In NTI with low T₃, the present method for FT₃ may not reflect an actual FT₃ concentration.

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STUDIES ON SERUM TRIIODOTHYRONINE MEASUREMENT WITH IMMOPHASE FT₃ KIT. I. Takada, Y. Abe, H. Kurokawa, Y. Fujita and Y. Yajima. Kitasato University, Sagami-hara.

IMMOPHASE FT₃ RIA Kit was evaluated fundamentally and clinically. The coefficients of variation estimated by three sera from hyperthyroidism, hypothyroidism and normals were less than 11% for intra-assay and less than 22% for interassay. Serum FT₃ concentration in normals was 0.43 ± 0.17 ng/dl (mean \pm SD). There was no change of FT₃ in relation to age or sexes. Serum FT₃ of untreated hyperthyroidism (1.80 ± 0.03 ng/dl) was higher than normals (p<0.001). Serum FT₃ of hypothyroidism (0.08 ± 0.03 ng/dl) was lower than normals (p<0.001). In treated hyperthyroidism, serum FT₃ was 0.41 ± 0.14 ng/dl and was the same level with normals. Positive correlation was noted between FT₄ and FT₃ (r=0.83, p<0.001). And positive correlation was noted between free T₃ index and FT₃ (r=0.89, p<0.001). In T₄ toxicosis, FT₃ was elevated, although T₃ was within normal limits.