

## 326

FUNDAMENTAL AND CLINICAL EVALUATION OF SERUM FREE TRIIODOTHYRONINE (T<sub>3</sub>) 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 T<sub>4</sub> have been widely measured by radioimmunoassay system in clinical cases. In this study, we evaluated a serum free T<sub>3</sub> radioimmunoassay system namely Amerlex Free T<sub>3</sub> RIA kit for clinical determining serum free fraction of T<sub>3</sub>. 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 T<sub>3</sub> (y) and serum free T<sub>4</sub> (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 T<sub>3</sub> concentration area. The serum free T<sub>3</sub> 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 T<sub>3</sub> concentration of patients with hypothyroidism was significant lower than those of normal subjects.

## 327

EVALUATION OF SERUM FREE T<sub>3</sub> 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 T<sub>3</sub> (F-T<sub>3</sub>) levels were measured by IMMO PHASE F-T<sub>3</sub> RIA KIT (Corning). The F-T<sub>3</sub> assay employs a two-tube procedure which was consisted of tube A for F-T<sub>3</sub> and tube B containing ANS for T-T<sub>3</sub>. After the 20 minute incubation at room temperature, T<sub>3</sub> antiserum solution was added into each tube. After the 60 minute incubation, each tube was centrifuged and decanted for counting.

Within assay error was  $4.53 \pm 0.36$  pg/ml (mean  $\pm$  S.D., C.V. 5.5%). Between assay errors using two different concentrations were  $1.19 \pm 0.16$  pg/ml (C.V. 13.4%) and  $5.44 \pm 0.36$  pg/ml (C.V. 6.6%), respectively. Recovery test of F-T<sub>3</sub> was 107.7%. Serum F-T<sub>3</sub> levels in 40 normal subjects were  $4.62 \pm 1.39$  pg/ml (male  $5.09 \pm 1.29$  pg/ml, female  $4.29 \pm 1.38$  pg/ml),  $18.28 \pm 3.69$  pg/ml in 10 untreated hyperthyroidism,  $1.33 \pm 1.73$  pg/ml in 6 untreated hypothyroidism,  $10.49 \pm 4.41$  pg/ml in 10 successfully treated hyperthyroidism,  $8.30 \pm 5.66$  pg/ml in 10 successfully treated hypothyroidism. Serum F-T<sub>3</sub> levels were also determined in pregnancy, liver cirrhosis and renal failure.

## 328

RADIOIMMUNOASSAY OF SERUM FREE T<sub>3</sub> 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 T<sub>3</sub> (FT<sub>3</sub>) and the results were compared with those by equilibrium dialysis method (ED). The RIA employs the ratio of labeled T<sub>3</sub> bound to antibody in the "A" tube to the total counts (A/TC) and A/TC  $\times$  T<sub>3</sub> was used as an indicator for FT<sub>3</sub>. The A/TC significantly related to %FT<sub>3</sub> 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 T<sub>3</sub> (0.0077-77 nmol/L) was added to normal sera, %FT<sub>3</sub> remained unchanged, whereas A/TC decreased as the T<sub>3</sub> more than 7 nmol/L was added. There was a reciprocal relation between TBG and A/TC (r=0.675, n=232, p<0.001). The relation between FT<sub>3</sub> 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-0.0055x<sup>2</sup>). The normal ranges (mean $\pm$ 2S.D.) for FT<sub>3</sub> were 2.7-5.6 pmol/L by ED and 2.7-8.4 pmol/L by RIA. The FT<sub>3</sub> by RIA agreed well with that by ED in various thyroidal status and in patients with low or high TBG levels, but FT<sub>3</sub> by RIA yielded a falsely lower values than those by ED in NTI with low serum T<sub>3</sub>. These results indicate that the RIA for FT<sub>3</sub> is a rapid and reliable method for quantifying FT<sub>3</sub> levels in TBG abnormalities as well as in hyper- and hypothyroidism, although the FT<sub>3</sub> by RIA tends to be lower as the T<sub>3</sub> level in serum increases, presumably because of large T<sub>3</sub> pool of antibody in this RIA system. In NTI with low T<sub>3</sub>, the present method for FT<sub>3</sub> may not reflect an actual FT<sub>3</sub> concentration.

## 329

STUDIES ON SERUM TRIIODOTHYRONINE MEASUREMENT WITH IMMOPHASE FT<sub>3</sub> KIT. I. Takada, Y. Abe, H. Kurokawa, Y. Fujita and Y. Yajima, Kitasato University, Sagami-hara.

IMMOPHASE FT<sub>3</sub> 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 FT<sub>3</sub> concentration in normals was  $0.43 \pm 0.17$  ng/dl (mean $\pm$ SD). There was no change of FT<sub>3</sub> in relation to age or sexes. Serum FT<sub>3</sub> of untreated hyperthyroidism ( $1.80 \pm 0.03$  ng/dl) was higher than normals (p<0.001). Serum FT<sub>3</sub> of hypothyroidism ( $0.08 \pm 0.03$  ng/dl) was lower than normals (p<0.001). In treated hyperthyroidism, serum FT<sub>3</sub> was  $0.41 \pm 0.14$  ng/dl and was the same level with normals. Positive correlation was noted between FT<sub>4</sub> and FT<sub>3</sub> (r=0.83, p<0.001). And positive correlation was noted between free T<sub>3</sub> index and FT<sub>3</sub> (r=0.89, p<0.001). In T<sub>4</sub> toxicosis, FT<sub>3</sub> was elevated, although T<sub>3</sub> was within normal limits.