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EVALUATION OF CLINICAL USEFULNESS IN MEASURING SERUM FREE  $T_3$  CONCENTRATION. T.Misaki, T.Kosaka, K.Arai, T.Nakashima, K.Kasagi, K.Endo, J.Konishi and K.Torizuka. Kyoto University School of Medicine, Kyoto.

Serum concentrations of free thyroid hormones may serve as important indicators of thyroid status. By using an Amerlex radioimmunoassay kit, we have examined serum levels of triiodothyronine ( $T_3$ ) in patients with thyroid diseases. All 30 thyrotoxic patients showed values over 6.04 pg/ml, whereas mean+s.d. of 35 hypothyroid patients was  $1.50 \pm 0.66$ , with 3 cases overlapping the reference values (2.48-5.40) obtained as mean+2s.d. of 31 healthy controls. 4 subjects with TBG deficiency showed normal or high-normal values. Pregnant females tended to have decreased free  $T_3$  levels as gestations went on. In patients with Graves' disease on anti-thyroid drugs, some had normal total  $T_3$  but increased free  $T_3$  concentrations. Their serum TBG levels were found to be low compared to those of patients with both normal total and free  $T_3$ , suggesting that the former were still slightly hyperthyroid. In hypothyroid patients, those after radioactive iodine therapy for Graves' disease had lower free  $T_3$  levels than patients with untreated Hashimoto's thyroiditis. This may reflect the difference in pathophysiology of hypothyroidism in these two groups. Thus, measurement of serum free  $T_3$  seemed to be useful in thyroid practice.

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FLUORESCENCE POLARIZATION IMMUNOASSAY OF THYROXINE AND THYROXINE BINDING SITES AND ITS CLINICAL SIGNIFICANCE. N. Kase, T. Teiri, M. Kiyota, S. Kuniyoshi, Y. Mochizuki and S. Shimoda. Department of Endocrinology, Internal Medicine, Dokkyo University School of Medicine, Mibu, Tochigi.

Fluorescence polarization immunoassay (FPIA) measures tracer-antibody binding directly by using certain properties of the fluorescent dye, fluorescein. We determined the serum levels of  $T_4$  and the  $T_4$ -binding sites in the serum using the TDX system-Abbott (an automatic analyzer for FPIA). TDX- $T_4$  levels were  $8.7 \pm 1.3$   $\mu\text{g/dl}$  (mean+SD, n=50) in normal controls,  $19.7 \pm 3.9$  (n=26) in untreated hyperthyroidism,  $3.9 \pm 1.9$  (n=6) in untreated hypothyroidism and  $12.4 \pm 1.7$  (n=33) in normal pregnant women. TDX-T-up take values, which indicate the  $T_4$  binding sites in the serum, were  $0.99 \pm 0.10$ ,  $0.75 \pm 0.10$ ,  $1.02 \pm 0.13$ ,  $1.47 \pm 0.20$ , respectively. TDX-FT4I (TDX- $T_4$ /TDX-T up take) were  $8.7 \pm 1.4$ ,  $26.6 \pm 6.9$ ,  $3.7 \pm 1.8$  and  $8.5 \pm 0.9$ , respectively. Coefficient correlation between TDX- $T_4$  and  $T_4$ -RIA and between the TDX-T-up take and TBG-RIA were  $0.95$  (n=160) and  $0.90$  (n=160), respectively. These results suggest that FPIA of  $T_4$  and  $T_4$ -binding sites reflects various thyroid states clinically as well as RIA.

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THE IMPROVEMENT OF STANDARD CURVE BY A DOUBLE ANTIBODY RADIOIMMUNOASSAY FOR CEA. M. Inoue. Okayama Clinical Laboratory (RI). Okayama.

Recently, carcinoembryonic antigen (CEA) is generally measured as tumour markers. There are three methods by Z-gell, solid phase, double antibody in radioimmunoassay for CEA. The method of solid phase is said to be good about precision. Eiken's kit for CEA (Eiken ICL) by a double antibody is easily used and it's sensitivity is as good as the method by solid phase. Standard curve (Logistic curve) of Eiken's kit is stable but height of it tends towards low a little. We attempted the improvement of standard curve to expect rise of precision and sensitivity.

Standard curve

$$(I) \frac{B}{T} \quad (II) \frac{B}{T_{3/4}} \quad (\text{three quarters of I-125 CEA Tracer})$$

$$(III) \frac{B-N}{T_{3/4}-N} \quad (IV) \frac{B}{B_0} \quad (V) \frac{B-N}{B_0-N}$$

N: Non specific bound

We carried out the fundamental investigations about five standard curves.

(Reproducibility of within assay and between assays, Dilution, Recovery, Condition of incubation) Standard curve (II) is better than the standard curve (I) in reproducibility and sensitivity. It seems effect of non specific bound is included in random error about Eiken's kit.

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BASIC AND CLINICAL EVALUATION OF NEW  $\beta_2$ -MICROGLOBULIN RIA KIT USING SECOND ANTIBODY ADSORBED SEPHAROSE. E. Ohtsuka. Department of Internal Medicine, Yamato City Hospital, Yamato

$\beta_2$ -microglobulin ( $\beta_2$ -m) is a small protein with molecular weight of 11800.  $\beta_2$ -m exists widely in human body fluid, such as serum, urine, saliva, liquor and milk. It is reported that the measurement of  $\beta_2$ -m is useful for the diagnosis of patients with renal failure, autoimmunity and malignant neoplasm. Solid phase RIA kit using antibody adsorbed sephadex is widely used for  $\beta_2$ -m measurement at present. Recently, new  $\beta_2$ -m RIA kit using second antibody adsorbed sepharose was developed and we performed basic and clinical evaluation of the kit. The assay procedure of this kit is very simple, namely, serum sample is required only 50  $\mu\text{l}$ , and sample dilution is unnecessary. In addition, in spite of adopting second antibody method, the only one incubation, 45 min. at room temp., is required.

$\beta_2$ -m values obtained by this kit showed good correlation with those by current kit. In clinical studies, mean value of 40 healthy donors was  $1.22 \pm 0.19$   $\mu\text{g/ml}$  and its range was 0.8 - 1.6  $\mu\text{g/ml}$ .  $\beta_2$ -m values in 29 patients with renal failure showed correlation with both serum creatinine and BUN statistically. These results indicate that the measurement of  $\beta_2$ -m value by this kit is available for clinical use.