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SERUM FREE THYROXINE LEVELS IN THE PATIENTS WITH GRAVES' DISEASE AFTER I-131 THERAPY AND WITH HYPOTHYROIDISM DURING ORAL ADMINISTRATION OF L-THYROXINE. Y. Ban, T. Inoue, T. Kojima, S. Iino and K. Ito

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Serum free thyroxine (FT₄) concentrations measured with GammaCoat FT₄ kit (normal range: 0.8-1.8 ng/100ml) in 64 euthyroid Graves' patients after I-131 therapy (Group A) and in 102 hypothyroid patients being treated with L-thyroxine (Group B), who were thought to be euthyroid. In the group A patients, FT₄ was 1.2±0.2 ng/100ml for those with TSH levels less than 5 μU/ml, 1.0±0.2 ng/100ml for those with TSH levels between 5-10 μU/ml, 1.1±0.3 ng/100ml for those with TSH levels between 10-20 μU/ml and 0.8±0.1 ng/100ml for those with TSH levels over 20 μU/ml. In the group B patients being treated with daily doses of 50, 100 and 150 μg of L-thyroxine, average concentrations of FT₄ were 1.2±0.2, 1.4±0.2 and 1.7±0.4 ng/100 ml, respectively. From these data, it was concluded that FT₄ concentration well reflected the metabolic status of the treated patients with thyroid dysfunction and was considered to be the useful parameter of the thyroid function. It was confirmed that 50 μg oral dose of thyroxine increase the FT₄ level as much as 0.2-0.3 ng/100ml and the average dose of L-thyroxine which maintain the hypothyroid patients in euthyroid state was 1.9 μg/kg/day.

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ANTICONVULSANTS AND FREE THYROXINE IN SERUM. Y. Suzuki, N. Kamma, M. Hiraiwa, H. Suzuki, S-I. Shimoda K. Mori,* M. Miyasaka.* Dept. of Endocrinology, Internal Medicine, Psychiatry*, Dokkyo University School of Medicine, Tochigi.

To evaluate the effect of anticonvulsants on serum levels of free thyroxine, 32 patients with epilepsy (mean age; 28.0±2.3 yr) were employed in the present study, who were receiving long-term (mean duration 81.8±8.9 months) anticonvulsants treatment. Blood samples were withdrawn to measure the serum levels of total thyroxine (TT₄), free thyroxine (FT₄), total triiodothyronine (TT₃), resin T₃ uptake (T₃U), and thyroxine-binding globulin (TBG). Free thyroxine index (T₇ value) was calculated from TT₄ and T₃U. Mean levels of these thyroid functions were as follows; 5.52±1.52 μg/dl (TT₄), 1.16±0.32 ng/dl (FT₄), 101.5 ±16.2 ng/dl (TT₃), 27.5±2.6 % (T₃U), 19.64±3.97 μg/ml (TBG) and 1.50±0.36 (T₇ value). These values except for T₃U were significantly lower (p<0.01) than those in control. Significant dose dependency (daily doses) was found between phenytoin (DPH) & TT₄, FT₄ or TBG. Other anticonvulsants (barbiturates, carbamazepin, etc.) or duration of treatment were not significantly correlated with these values. Therefore, serum level of DPH was measured in 19 patients with epilepsy. Significant negative correlation was found between DPH & FT₄ or TBG. In the present study, it might be concluded that DPH depress not only serum level of FT₄ but also TBG.

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MODIFICATION OF T₃ UPTAKE RATIO USING SPAC-T₃ KIT, AND ITS APPLICATION FOR FREE T₄ INDEX. F. Yoshimura, A. Ishihara, R. Ono, M. Yukawa, Y. Yoshimasa, S. Yamada, and S. Hamada. RI division. Department of Clinical Pathology, and Endocrinology, Tenri Hospital, Tenri

We previously reported that in high T₃ serum (>500ng/dl) T₃U values determined at room temperature by T₃-antibody coated test-tubes (SPAC-T₃ kit) were decreased to the normal range and that free T₄ index (FT₄I) using the T₃U was not linearly correlated to free T₄ concentration measured by equilibrium dialysis. Therefore, we modified the procedure to incubate at 4°C for 60 min. C.V.s were 2.1-6.2% for intra-assay and 2.0-3.3% for inter-assay, and the counting rates were high enough in hypothyroidism. Values for 4°C-T₃U were not affected by enrichment of sera with up to 800ngT₃/dl, and were inversely related to T₃U ratios measured by the resin-strip method (r=-0.912). The values obtained in hyperthyroidism were higher than those by the room-temperature method, showing a remarkable decrease in overlap with normal subjects. They were decreased in hypothyroidism and pregnancy. As a result, values for 4°C-FT₄I were even increased in hyperthyroidism and decreased in hypothyroidism. Values for pregnancy remained within the normal range. The 4°C-FT₄I indicated excellent correlations to free T₄ concentrations measured by equilibrium dialysis (+0.930) and by the radioimmunoassay (+0.904). It is concluded that the simple modified procedure for T₃U is more accurate and useful for routine examination.

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COMPARISON OF COMMERCIAL SOLID PHASE T-3 RIA KITS. T. Inaba, T. Yatabe, A. Kuroda, K. Chiba, H. Murata and H. Yamada Tokyo Metropolitan Geriatric Hospital

Comparative study of commercially available T-3 RIA kits, that is T-3 RIA III, SPAC T-3, Corning T-3 and Gammacoat T-3, was performed. In each kits, dilution test, recovery test, intra- and inter-assay reproducibility, response error relationship and comparison of results in unknown samples with T-3 RIA II were performed.

In dilution test every kit showed linear relationship at the high value range. However every kits except T-3 RIA II (PEG) showed bending of dilution line below 0.25 ng/ml, that indicates lack of sensitivity. Recovery test were well tolerated in T-3 RIA III, Corning T-3 and SPAVC T-3, but Gammacoat T-3 showed low recovery ratio in the low value range.

Every Kits except T-3 RIA III showed excellent intra-assay reproducibility (2-3%) in high value range. However in the low value control serum CV % was 7-12. While inter-assay reproducibility showed 8.5-15% in low value range. In high value range Gammacoat T-3 and Corning T-3 showed excellent reproducibility.

RER was best in T-3 RIA III. Corning T-3 was next good. In comparison of clinical samples correlation coefficient between solid phase kits and T-3 RIA III was over 0.95 in every kits. However absolute values of T-3 were lower in any kits than in T-3 RIA III.