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FREE TRIIODOTHYRONINE MEASUREMENT:COMPARISON BETWEEN SOLID-PHASE RIA & DIALYSIS METHOD.
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It has been well documented that precise thyroid function was not estimated by total thyroid hormone measurement but by free thyroid hormone measurement. At present, free thyroxine(fT4) was measured generally for clinical use according to the improvement of RIA kits but free triiodothyronine(fT3) was not routinely measured. As we had a chance to use fT3 RIA kit supplied by Corning Co., sera obtained from patients with thyroid disorders and healthy subjects were measured by RIA and standard dialysis method and fT3 values obtained by these two methods were compared. Thirty eight patients with hyperthyroidism, 8 patients with hypothyroidism and 27 healthy subjects were employed at the present study. Other thyroid function studies were also performed. The results of thyroid functions in these three groups were as follow; fT3: 18.4±5.5 pg/ml(HYPER), 1.0±0.9pg/ml(HYPO), 3.9±1.3 pg/ml(EU), fT4: 7.4±3.7ng/dl(HYPER), 0.6±0.1 ng/dl(HYPO), 1.7±0.5 ng/dl(EU), TBG: 18.7±5.5 µg/ml (HYPER), 28.6±4.7 µg/ml(HYPO), 23.4±4.9 µg/ml(EU). Significant positive correlations were found between fT3 and other thyroid functions(fT4:r=0.7784, tT4: r=0.8394, tT3:r=0.9277, T3U:r=0.7003). In the case of TBG, there was a negative correlation to fT3(r=-0.55 25). The significant positive correlation was also found between fT3 measured by RIA & dialysis($p<0.01$, r=0.8520). Conclusively, fT3 values obtained by RIA were useful for evaluating thyroid states because of its clear separation of thyroid disorders from normal controls and highly significant correlation to dialysis method.

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THE MEASUREMENTS OF SERUM T_4, T_3, TSH AND T_3 UPTAKE BY YB RIA KIT.
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The measurements of serum T_4, T_3, TSH and T_3 Uptake by YAMASA BD RIA kits were investigated.

The standard curves obtained for each T_4, T_3, TSH were as good as those by other kits. The coefficient of variation in intraassay was 7.5% for T_4, 5.3% for T_3, 2.6% for T_3 Uptake and 7.7% for TSH. The coefficent of variation in interassay was 6.3%, 5.5%, 3.0%, and 10.9%, respectively. These values were as excellent as those in other kits.

The concentrations of serum T_4, T_3, TSH, and T_3 Uptake were 8.9±1.5 µg/dl, 171±19 ng/dl, 2.6±1.2 µU/ml and 38.7±2.1% (mean±SD, n=25) in normal subjects, 20.5±4.4, 461±163, 0.03±0.1 and 47.7±2.9(n=25) in patients with Graves'disease, and 2.0±2.0, 59.1±30.9, 116±74.1 and 34.4±2.5(n=30) in patients with hypothyroidism, respectively. Results using YB kits showed strongly correlation with those using Eiken kits and Chugai kit. Correlation coefficients of T_4, T_3, TSH and T_3 Uptake were r=0.988, 0.984, 0.961, 0.910, respectively.

The assay by YB kits is fast, accurate and easy to perform and clinically useful.

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EVALUATION OF THYROID FUNCTION STUDY WITH THE ARIAII AUTOMATED RIA SYSTEM,
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The present study was undertaken to examin in a completly automated RIA system "ARIAII" for measurments of in vitro thyroid function tests(T-3,T-4,TSHand T-3uptake)in comparison with those of manual methods. The system uses solid phase RIA methods,in which antibodies are covalently coupled to surfaces of glass pellets(solid phase),combined in a small chamber.So the antibodies in the Chamber can be repeatedly used through recycles among washing out,binding and eluting. the advantageous is minimized radioactive solid waste. The laboratory experiments with the ARIAIIsystem showed so good results as those of manual methods concerning precision,recovery and dilution tests The measurements with standard sera were significantly correlative with those of manual methods(r=0.913inT-3,r=0.965inTSH,r=0.903in T-4 and r=0.899 in T-3 uptake) and those of Concept 4(r=0.940 inT-3 and r= 0.925 in T-4). The assays in normal subjects ranged 107.1-195.5ng/dl in T-3,6.21-10.93µg/dl in T-4,below 2.37µu/ml in TSH and 24.1-31.3% in T-3 uptake.
The assays in thyroid disorders showed a good separation among hyper-,eu and hypothyroid. Those results indicated clinical usefulness and reliability of the ARIAII system.

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THE MEASUREMENT OF THE CONCENTRATIONS OF SERUM T_4 BY TETRAZYME AND T_4 UPTAKE BY THYROZYME UPTAKE.
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The kits of Tetrazyme by Enzyme inhibitor immunoassay and Thyrozyme Uptake by Enzyme inhibitor assay (Abbott) were studied. These assaies are based on the nature of enzyme inhibitor that lose activity after binding to protein. T_4 bound enzyme inhibitor loses its inhibiting activity after binding to anti-T_4 antibody or TBG. The enzyme activity uninhibited in this assay system is dependent on the amount of anti-T_4 antibody bound T_4, which is employed in Tetrazyme to measure serum T_4, and also dependent on TBG bound T_4, which is used in T_4 Uptake. These assaies were carried by Abbott VP autoanalyzor. Good correlations were observed between values for serum T_4 obtained by Tetrazyme and those by RIA, and between T_4 Uptake and T_3RSU. The rate of T_4 to T_4 Uptake(FT_4I) obtained by these methods is consistent with free T_4 obtained by dialysis or RIA, and is a good index for thyroid function. It was only 15 minutes to carry out the measurent of 15 samples either by Tetrazyme or by Thyrozyme Uptake.

These results indicate that the measurements by both kits are simple and rapid without using isotope and that the results obtained by these kits reflect well thyroid function.