and an alternative appropriate normal ranges had to be defined. Thus, the range of 0.87–1.10 was arbitrarily selected by inspections as the best euthyroid ETR range. By using this euthyroid range, the ETR values gave 97.1% accuracy in diagnosing hypothyroid, euthyroid and hyperthyroid subjects. Similarly, the euthyroid T₄ range giving maximum discrimination between hypothyroid, euthyroid and hyperthyroid subjects was 4–13 μg/100 ml. The diagnostic accuracy was 91.6% in this range, because of including the patients with abnormal TBG capacities in euthyroid group. The results indicated that ETR values were the useful indicator of thyroid function and that it was possible to find out the patients with abnormal TBG capacities, by means of determining T₄ simultaneously.

Serum Reverse-Triiodothyronine (r-T₃) Level in the Aged

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Serum level of triiodothyronine was reported to be decreased in some aged people. In order to elucidate the metabolism of thyroidal hormones, serum r-T₃, T₃, T₄ and TSH levels were measured in both adult and aged people.

Materials and Methods: Serum r-T₃, T₃, T₄ and TSH were measured in 16 aged extrathyroidal patients, from 66 y.o. to 91 y.o. (Group-II) and 9 normal subjects, from 27 y.o. to 48 y.o. (Group-I). The r-T₃ was measured with RIA-kit of HYPO-laboratory. TSH and T₃ were determined by RIA-method and T₄ by CPBA-method.

Results: Serum T₄ and T₃ levels in Group-II (T₄: 72±41 ng/ml, T₃: 0.70±0.29 ng/ml) showed lower values than those in Group-I (T₄: 87±11 ng/ml, T₃: 1.41±0.15 ng/ml). On the other hand, serum r-T₃ levels in Group-II (0.58±0.28 ng/ml) were significantly higher than those in Group-I (0.355±0.33 ng/ml). The r-T₃/T₃ ratio in Group-I (0.24±0.04) remained to be constant, while the r-T₃/T₃ ratio in Group-II (1.12±0.89) showed higher value on the average with large variation from case to case. In all patients of Group-I with serum r-T₃ level more than 0.5 ng/ml, the serum T₃ level remained less than 1.0 ng/ml. Ratio of r-T₃/T₄ in Group-I (0.00417±0.00068) were lower than those in Group-II (0.0098±0.004), and T₃/T₄ ratio in Group-I (0.0172±0.077) were higher than those in Group-II (0.0082±0.0058).

Conclusion and comments: Serum T₃ and T₄ levels in the aged patients showed lower values than those in normal adults. On the other hand, serum T₃ level in the aged patients was remarkable higher than that in the normal adults. These facts might suggest that the metabolic degradation of T₄ into T₃ could be more dominant in the elderly people than control, while, in control, T₄ could be predominantly metabolized in to T₃. The effect of chromic illness in elderly patients upon thyroxine metabolism should be further evaluated.

Determination of Tissue T₃ and T₄ Concentrations

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Recently it has been demonstrated that conversion of T₄ to T₃ in the peripheral tissue plays an essential role in the biological effectiveness of thyroid hormone. It is, therefore, important to determine the tissue T₃ and T₄ concentrations for the study on the metabolism and the effects of
thyroid hormones. There have been reported several methods to determine tissue concentrations of thyroid hormones, i.e., 1) ethanol extraction, 2) butanol-chloroform-ammonia extraction (ammonia 3x), and 3) butanol-chloroform-ammonia extraction (ammonia 1x). In the present experiment, the above published methods were compared with a method using small Sephadex G-25 columns in which tissue homogenates were dissolved in 1.5 N NAOH and then applied to the Sephadex columns. The rest of the procedures was the same as that in the measurements of serum T₃ and T₄ concentrations by Seraluter and Tetraluter.

Parallelism of dilution curves of extracts to the standard curve were not observed in either ethanol extraction or butanol-chloroform-ammonia (3x) extraction. Good parallelism was obtained in the method of butanol-chloroform-ammonia (1x) extraction, but recovery of both T₄ and T₃ were low. In the method to extract and determine T₃ and T₄ by Sephadex G-25 column, both parallelism and recovery were satisfactory and hence, this method could be considered to be the most useful method to determine tissue T₃ and T₄ concentrations.

**Serum Thyroid Hormone Levels in Patients with Liver Diseases and Schistosomiasis Japonica**

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The levels of thyroxine (T₄) and triiodothyronine (T₃) and thyroxine stimulating hormone (TSH) were measured for sera obtained from patients with Schistosomiasis japonica and various liver diseases by using radioimmunoassay kit (RIA) (Ribagnost). Thyroxine bidding capacity (TBC) was also measured by competitive protein binding assay method (CPBA).

The average values (TBC%, T₃ ng/ml, T₄ μg/dl, TSH μU/ml) were 101.3±9.68, 0.93±0.64, 9.79±4.44, 7.21±3.12 in patient with hepatitis (n=59), 100.2±17.2, 0.78±0.37, 8.29±2.72, 6.85±3.90 in liver fibrosis (n=29), and 101.13±11.5, 0.56±0.36, 6.95±2.86, 9.60±4.46 in liver cirrhosis (n=59). T₃ values in patients with hepatitis was inversely correlated with age (r=−0.41, p<0.01). T₄ values measured by RIA method were always lower than those by CPBA method, the relation being Y (RI)=0.423×(CPBA)+1.371 r=0.539, p<0.01, n=40).

A significant decrease in T₃ value and almost normal T₄ level and slightly increased TSH level are compatible with the view that the liver may play a significant role in peripheral T₄→T₃ conversion in man.

**Diagnosis of Thyroid Tumors by Thyroid Scanning with ¹²³I and ¹³¹I**

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We used the thyroid scanning with ¹³¹I or ¹²³I for determining whether a thyroid tumor is malignant or not. Cesium is a monovalent cation and belongs to IA group in the periodic table. Though thallium belongs to IIIA group, it is a monovalent cation. Therefore thallium may be biologically similar to cesium. 1) Thyroid scans were performed on 44 cases of thyroid tumors with ¹³¹I and 19 cases of thyroid tumors with ¹²³I, histologically verified by surgery. The percent positive scan of 28 cases of malignant tumors and 16 cases of benign tumors using ¹³¹I were 71.4% (20/28) and only 12.5% (2/16) respectively. Twenty of 22 cases of positive scan with ¹³¹I