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 T_4 range giving maximum discrimination between hypothyroid, euthyroid and hyperthyroid subjects was 4–13 μg/100 m*l*. 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 T_4 simultaneously.

Serum Reverse-Triiodothyronine (r-T_3) 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-T_3, T_3, T_4 and TSH levels were measured in both adult and aged people.

Materials and Methods: Serum r-T_3, T_3, T_4 and TSH were measured in 16 aged extrathyroidal patients, from 66y.o. to 91 y.o. (Group-II) and 9 normal subjects, from 27 y.o. to 48 y.o. (Group-I). The r-T_3 was measured with RIA-kit of HY PO.-laboratory. TSH and T_3 were determined by RIA-method and T_4 by CPBA-method.

Results: Serum T_4 and T_3 levels in Group-II (T_4: 72 ± 41 ng/m*l*), T_3: 0.70 ± 0.29 ng/m*l*) showed lower values than those in Group-I (T_4:87 ± 11 ng/m*l*, T_3:1.41 ± 0.15 ng/m*l*). On the other hand, serum r-T_3 levels in Group-II (0.58 ± 0.28 ng/m*l*) were significantly higher than those in Group-I (0.355 ± 0.33 ng/m*l*). The r-T_3/T_3 ratio in Group-I (0.24 ± 0.04) remained to be constant, while the r-T_3/T_3 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-T_3 level more than 0.5 ng/m*l*, the serum T_3 level remained less than 1.0 ng/m*l*. Ratio of r-T_3/T_4 in Group-I ($0.00417+0.00068$) were lower than those in Group-II ($0.0098+0.004$), and T_3/T_4 ratio in Group-I ($0.0172+0.077$) were higher than those in Group-II ($0.0082+0.0058$).

Conclusion and comments: Serum T_3 and T_4 levels in the aged patients showed lower values than those in normal adults. On the other hand, serum r-T_3 level in the aged patients was remarkable higher than that in the normal adults. These facts might suggest that the metabolic degradation of T_4 into r-T_3 could be more dominant in the elderly people than control, while, in control, T_4 could be predominantly metabolized in to T_3. The effect of chromic illness in elderly patients upon thyroxine metabolism should be further evaluated.

Determination of Tissue T_3 and T_4 Concentrations

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Recently it has been demonstrated that conversion of T_4 to T_3 in the peripheral tissue plays an essential role in the bilogical effectiveness of thyroid hormone. It is, therefore, important to determine the tissue T_3 and T_4 concentrations for the study on the metabolism and the effects of

thyroid hormones. There have been reported several methods to determine tissue concentratations 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 T_3 and T_4 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 T_4 and T_3 were low. In the method to extract and determine T_3 and T_4 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 T_3 and T_4 concentrations.

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

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The levels of thyroxine (T_4), triiodothyronine (T_3) and thyroxine stimulating hormone (TSH) were measured for sera obtained from patients with Schistomosiasis japoniac and various liver diseases by using radioimmunoassay kit (RIA) (Riagnost). Thyroxine bidding capacity (TBC) was also measured by competitive protein binding assay method (CPBA).

The average values (TBC%, T_3 ng/m*l*, T_4 μg/d*l*, TSH μU/m*l*) were 101.32 ± 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 ($n=59$). T_3 values in patients with hepatitis was inversely correlated with age ($r=-0.41$, $p<0.01$). T_4 values measured by RIA method were always lower than those by CPBA method, the relation being Y (RI)$=0.423 \times$ (CPBA)$+1.371$ $r=0.539$, $p<0.01$, $n=40$).

A significant decrease in T_3 value and almost normal T_4 level and slightly increased TSH livel are compatible with the view that the liver may play a significant role in peripheral $T_4 \rightarrow T_3$ conversion in man.

Diagnosis of Thyroid Tumors by Thyroid Scanning with ^{201}Tl and ^{131}I

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We used the thyroid scanning with ^{131}Cs or ^{201}Tl 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 ^{131}Cs and 19 cases of thyroid tumors with ^{201}Tl, histologically verified by surgery. The percent positive scan of 28 cases of malignant tumors and 16 cases of benign tumors using ^{131}Cs were 71.4% (20/28) and only 12.5% (2/16) respectively. Twenty of 22 cases of positive scan with ^{131}Cs