

Kinetic Analysis of Triiodothyronine Outside Thyroid with ^{131}I -L-Triiodothyronine by Aid of Computer—with Special Reference to Liver Diseases

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The peripheral metabolism of triiodothyronine in various disease was studied using ^{131}I -L-triiodothyronine. Clinical materials were composed of 6 cases of chronic hepatitis, 5 of liver cirrhosis, one case of precirrhosis, 2 cases of hyperthyroidism, 2 of hypothyroidism, one case of low TBG and 5 cases of hospital controls. By assuming a three-compartment model, kinetic analysis of peripheral triiodothyronine (T_3) distributions in various organs were calculated based upon the disappearance curve of ^{131}I - T_3 radioactivity in the serum, time dependent curve of radioactivity over the liver and the rate of urinary excretion in attempts to clarify the kinetic distribution of T_3 and the time dependent pool size of T_3 in each compartment such as serum pool (P_1), liver pool (P_2) and the other pool (P_3). The T_3 concentration in the serum was assayed by Sterling's method.

In controls, time giving the peak of hepatic radioactivity after i.v. injection of ^{131}I - T_3 was 9 ± 2 min., whereas 11 ± 3 and 20 ± 0.8 min. in the cases of chronic hepatitis and liver cirrhosis respectively. The values of serum T_3 concentration were 218.3 ± 7.6 ng/dl in controls, 211.0 ± 9.9 and 196.0 ± 13.5 in the cases of chronic hepatitis and liver cirrhosis. The cases of liver diseases showed a remarkable decrease in the values of P_2 , a rate constant for inflow to the liver (K_{21}), to the serum from the other pool (K_{13}) and biliary excretion of T_3 during 24 hours, contrarily a slight increase in the values of P_3 and within normal limits in the values of P_1 and the rate of urinary excretion of the radioisotopes during 24 hours ($26 \pm 6\%$ dose). The rate of the metabolism of T_3 in the liver was quicker than that of thyroxine.

Significance of TIBC and LIBC Measurement in Severe Cirrhosis of the Liver

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The purpose of this paper is to study whether TIBC (Total Iron Binding Capacity) or LIBC (Latent Iron Binding Capacity) may be a good index indicating the degree of severity in the cirrhosis of the liver. 1) Materials: The patient studied were as followed; group 1: 30 cases with LC (the cir-

rhosis of the liver) & SC (schistosomiasis), group 2: 7 cases with LC, SC & hepatoma, group 3: 1 case with SC & hepatoma, group 4: 8 cases with SC & acute hepatitis, group 5: 23 cases with SC, group 6: 2 cases with LC, group 7: 14 cases with acute hepatitis, and 18 cases of normal control. Diagnosis was

determined by biopsy, laparoscopy, and necropsy in LC and hepatom. 2) Methods: LIBC was measured by the method of ⁵⁹Fe IROSORB. Serum iron level was measured by the method of Schweizerhall. TIBC was calculated by mathematical addition of LIBC and serum iron level. All measurements were performed on the early morning at fasting stage. 3) Results: a) Values of TIBC and LIBC: In group 1, 2 & 6, TIBC was 60.2 to 526 μ g/dl, and LIBC was 0 to 430 μ g/dl. In group 5, TIBC was 120 to 400 μ g/dl, and LIBC was 40 to 325 μ g/dl. In group 4 & 7, TIBC was 208 to 496 μ g/dl, and LIBC was 0 to 265.1 μ g/dl. b) Relationship between TIBC and LIBC: LIBC was plotted against TIBC. There was positive correlation between them in group 1, 2, and 5, although all the cases which indicated small values of TIBC did not always have small values of LIBC. In group 4 & 7, TIBC gave various values, when LIBC gave small values. c) The patients of the liver diseases were divided into group A and B according to the following criteria. In group A, TIBC is below or equal to 200 μ g/dl and LIBC is below or equal to 100 μ g/dl. In group B, TIBC is higher than 200 μ g/dl and LIBC is higher than 100 μ g/dl. The numbers of cases in group A were 13 among 39 in group 1, 2 & 6, 0 among 22 in group 4 & 7, and 3 among 23 in group 5. The numbers of cases which belonged to group B, were 15 among 39 in group 1, 2 & 6, 12 among 22 in group 4 & 7, and 17 among 23 in group 5. c) of the case.

In LC (group 1, 2 & 6) 9 cases of 13 cases belonging to group A died of coma, and varices bleeding, while only 2 cases of 15 cases belonging to group B died of coma and varices bleeding. d) Progressive changes of TIBC and LIBC in LC: In 3 cases of LC, TIBC and LIBC decreased gradually on the course and then TIBC indicated extremely small values, while LIBC fell even to 0, when they died of coma. TIBC indicated extremely small values and LIBC became 0, when 3 other patients were admitted complaining of coma, but TIBC and LIBC increased gradually and returned to normal values according to the recovery from coma and improvement in their condition. In one case TIBC and LIBC resulted in a marked increase after varices bleeding and gradually returned to normal values by therapy. 4) Discussion and conclusion: Transferrin is synthesized in the liver. The damages of the liver, especially as found in LC, result in decrease of synthesis of transferrin causing low transferrin level (TIBC) in blood. In the severe cases of LC, ability of transferrin synthesis is extremely small resulted in a marked small values of TIBC. But in the cases which have still considerable ability of synthesis, TIBC and LIBC are able to return to normal values by therapy, although these values indicate marked decrease during coma. Therefore, it is thought that a marked decrease of TIBC and LIBC in LC, when it is consistent, shows poor prognosis

Hemodynamics of Liver Circulation after Birth —Experimental Survey of Intrahepatic Shunt in the Newborn Lamb Using ¹³¹I-MAA—

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Our previous studies on the hemodynamic changes after birth gave the results suggesting the presence of physiological shunts in

the liver in early neonatal period.

In the present study 16 experiments were performed on 12 newborn lambs of natural