the value K varied depending upon subjective factors, i.e. the saturation level decided by the individual, plotting the logarithm of activity against time, drawing the slope and so on. (Ex. 1:Mean 0.113 S.D. 0.023, max. 0.144 min. 0.071 Ex. 2: Mean 0.117, S.D. 0.022, Max 0.151, Min. 0.086 Ex. 3: Mean 0.1006, S.D. 0.015 Max. 0.151 Min 0.091)

Like this we know 2nd decimal number varies according to different calculators even in the same accumulation curve.

Conclusions

We must deal with liver blood flow index as it's second decimal number sometimes varies in the same patient at the same time according to the location of detector and subjective factors. And it seems meaningless to compare third decimal number in liver blood flow index.

Studies on Liver Circulation by RI in Hepatic Diseases Fluctuations due to changes of posture resulting in changes of circulation time and arterial, portal blood flow in liver

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At the previous meeting we reported that in liver clearance tests with ^{198}Au-colloid conducted in various liver diseases in our attempts to find out changes in liver circulation due to changes of posture we studied liver uptake indices, KL and K'L, both at supine and sitting postures, and found that there was a decrease of K'L in the control and chronic hepatitis while there was a slight increase of it in liver cirrhosis. This time, for the purpose to reconfirm the increase of K'L in still a greater number of patients as well as to elucidate its mechanism, prior to the intravenous injection of ^{198}Au-colloid, we studied, using RISA, the liver circulation time, especially the commencement time of cervical, arterial and portal vein circulation, arterial liver blood flow ratio, cardiac output and the amounts of systemic blood flow, and on the basis of this study we calculated the amounts of liver blood flow, cervical, arterial and portal blood flow. At first in spine posture we placed 2 detectors just above the heart and the liver and measured blood pressure and palpitations. Then 20 μc RISA were rapidly injected intravenously at supine posture, and then similar procedures were repeated at sitting posture and took radiocardiograms and radiohepatograms, and then, after a certain interval the blood was drawn, and the liver uptake curves of ^{198}Au-colloid both at supine and sitting postures were reccorded. As the result it was found that the commencement time of liver arterial and portal blood flow (a~b and a~d time) was prolonged in control and chronic hepatitis groups whereas it was shortened in liver cirrhosis.

Liver arterial blood flow ratio at sitting posture increased in control and chronic hepatitis while it decreased in liver cirrhosis. As for the cardiac output at sitting posture, it was clearly increased in the control but in chronic hepatitis it was rather diminished, and no significant change in liver cirrhosis. As for the mutual relationship among the fluctuation rate of KL due to ^{198}Au-colloid and a~b and a~d time, cervical, arterial blood flow ratio, and the fluctuation rate of cardiac index due to the changes of posture, both the control and chronic hepatitis did not show any mutual relationship; liver cirrhosis showed a marked decrease in both a~b and a~d time; but both a—b time ($r=0.46$) and a—d time ($r=0.42$) proved to P 0.05. The amount of systemic blood flow in liver cirrhosis was rather slightly decreased as compared with the control. The hepatic blood flow was clearly decreased in the control, but no significant change in chronic hepatitis and liver cirrhosis. As for the blood flow in cervical arterial and portal vein, both were decreased in the control whereas portal blood flow was slightly raised in liver cirrhosis.

From these findings it is assumed that the behavior of K'L in liver cirrhosis is dependent mainly upon the constancy of cervical, portal liver blood flow at sitting posture.

Studies of Hepatic Circulation Using ^{198}Au Colloid, ^{125}I RB & ^{131}I RB in the Liver Diseases

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The purpose of this report is to make a contribution to differentiate and to evaluate the various liver disorders.

Total cases are 92, including normal 20 cases hepatic tumor 31 cases, liver cirrhosis 22 cases, hepatitis 8 cases and others 11 cases.

Applying these tests to make external counting fasting patients are placed in the supine position.

Two scintillation probes with the crystal 2″ ϕ×2″ are placed over the liver and left femoral region.

The collimator over the liver is flat-field type and a lead plate measuring 1 cm thick is devised to shield the influence of the heart and spleen.

The simultaneous measurement with ^{125}I RB and ^{198}Au colloid is carried out.

At first ^{125}I RB is administered i.v. The radioactivity is counted with scintillation rate-meter for 45 min.. After that 6 μCi/Kgm B. W. of ^{198}Au colloid is injected i.v. and differential measurement is done.

Then, counting is carried out until hepatic curve reaches to plateau.

The curve of concentration of the ^{125}I RB shows gradual logarithmical declining line usually after 5 min. of its injection.

The test using ^{125}I gave the same result at periphery with that using ^{131}I RB.

^{125}I RB peripheral concentration value of 5 min. is compared with that of 20 min. and 20:5 min. proportion i.e. P.C.R. is expressed as a percentage.

Normal value fell between 42 and 56%.
Liver tumor 44—80%
Heart failure 46—69%.
Liver cirrhosis 62—90%.
Hepatitis 56—77%.

^{125}I RB test mainly represents a function of polygonal cell and biliary tract.

The rate constant (K) of the ^{198}Au colloid liver uptake is obtained from the liver uptake curve.

Normal value ranged from 0.132 to 0.200.
Liver tumor 0.065—0.172.
Hepatitis 0.092—0.192.
Liver cirrhosis 0.053—0.145.
Heart failure 0.0061—0.117.

^{198}Au colloid test shows effective liver blood flow.

Applying each test on these liver disorders, there are overlap on the obtained values of each test among the diseases, however, both test results are combined to investigate the relationship between ^{125}I RB test and 198Au colloid test.

Taking ^{125}I P.C.R. on the horizontal line and the rate constant (K) on the longitudinal line, it became very easy to differentiate the various liver diseases.

The normal group is distributed on the left upper part of the diagram, group of hepatitis on the right upper part, group of cirrhosis on the right lower part and group of heart failure on the left lower part, showing a radiating distribution around the normal group as a center. .

Primary or metastatic liver tumor does not show such characteristic distribution as diffuse liver disease.

The statistic observation on the liver diseases in the ^{125}I RB ^{198}Au colloid combined diagram represents the characteristics of the various liver diseases, and if it is plotted on the right upper part, it represents the disturbance of liver cells or biliary