129. THE BIOCHEMICAL AND HISTOLOGICAL STUDY ON THE LIVER IN CONGESTIVE HEART FAILURE

N. KIMURA, H. TOSHIMA, T. MIZUGUCHI, Y. NAKAURA, T. ARIMA
The 3rd Department of Internal Medicine, Kurume University School of Medicine
S. YAMASAKI
The Clinical and Biochemical Laboratory of Kurume University School of Medicine

62 patients were studied on liver function tests before and after the improvement of congestive heart failure. The relationship between histological changes of the liver and liver function tests prior to death was also studied in 109 autopsied patients died of heart failure. The serum protein increased with the improvement of the protein fraction. The BSP retention decreased from average 14.4% to 7.4%. The high serum transaminase activity obserbed in 4 cases returned rapidly to normal range after treatment of the heart failure. An increase of serum bilirubin, especially indirect bilirubin, was observed in some cases without pulmonaly infarction, however LDH_1 and LDH_2 did not increase as compared with those in hemolytic jaundice due to the ball valve replacement in rheumatic heart disease. Whereas elevations of α-hydroxybutylic acid in these cases seemed to be reflections of myocardial damage in the patients with heart failure. Therefore hemolytic mechanism did not seemed to be a major fatcor to jaundice in heart failure. The histological diagnosis of the liver in heart failure was made on the classification of Nakashima and Imazato. The prolonged BSP retention, alterd serum protein fraction and high venous pressure were relatively correlated with the grade of histological changes. Cases with high serum transaminase activity were observed in the Grade 1~2 (necrosis and hemorrhage was observed in area more than the one-third including the central vein in lobules). The results obtained in this study were as follow; 1) alterd liver function tests were reversible by treatment of congestive heart failure, 2) the severity and duration of congestive heart failure influenced on the histological changes of the liver, 3) hemolytic mechanism was not a major factor to jaundice in congestive heart failure and 4) clinical manifestations and liver function tests could evaluate the severity of the histological changes of the liver in congestive heart failure.

130. HEPATIC FUNCTION AND CIRCULATION: APPLICATION OF TRAPEZOIDAL ELECTROMAGNETIC FLOWMETER TO THE STUDIES OF HEPATIC CLEARANCE WITH INDOCYANINE GREEN AND ^{198}AU COLLOID

Y. YOKOYAMA, T. KISHIMOTO, S. IWATSUKI, T. NAKAMURA, T. MIKI, K. TAKESHIGE, M. KASUYA, Y. FUKUHARA, K. KUROKAWA, R. HIDEMURA, and S. YAMAMOTO
Second Department of Surgery, Nagoya University School of Medicine

Indocyanine green (ICG) and ^{198}Au colloid have been used clinically as reliable indices of hepatic function and circulation, however, their exact relationship to changes of hepatic blood flow is not yet understood. This paper deals with our attempts to analyse their relationship particularly in hepatectomized dogs using the above-mentioned agents and the trapezoidal electromagnetic flowmeter developed by us recently.

For experiments mongrel dogs weighing 6~12 kg were used. Measurement of hepatic arterial flow (HAF) was performed by applying the probe on the common hepatic artery after deviding the right gastric and gastroduodenal artery, and that of portal vein flow (PVF) was done after deviding the pancreaticoduodenal vein. Administrations of ICG and ^{198}Au were 0.25 mg/kg and 20~50 μc respectively, and blood samples were taken at 2, 4, 6, and 8 minutes after injection, and disappearance rate K (min^{-1}) was calculated.

In control group measurements were made before and 1 hour after sham operation. In hepatectomy group partial hepatectomies of various extents were performed in 12 dogs and measurements were made 1 hour before and 10 minutes after the operation.

Results were as follows. In control dogs changes of hepatic blood flow (HF) during 1 hour period were not significant, the average being 1.2%, whereas HAF tended to increase (the average, 14?) and PVF tended to dcrease (the average, 3%). On the contrary results of ICG showed wide fluctuations (±30%), whereas those of ^{198}Au were comparatively small (±10%).

In hepatectomy group the results of flowmeter measurement revealed that in an extensive hepatectomy of over 60% HF was markedly reduced, and however in hepatectomies of less than 45% varied changes of HAF and PVF were observed in spite of steady reduction of HF proportional to extent of hepatectomies. In ICG and ^{198}Au studies the results of over 60% hepatectomy were almost identical with that of the flowmeter, whereas those of less extensive hepatectomies showed large fluctuation in values along with increase of hepatectomy rate, in which it was noticed changes of ICG values seemed to coincide with that of HAF in flowmeter measurement.

In conclusion it was ascertained the flowmeter and hepatic clearance of ICG and ^{198}Au showed marked reduction of hepatic circulation when hepatectomy was extensive (over 60%), whereas they did not always coincide with each other when hepatectomy was less extensive (less than 45%), and therefore complex nature of hepatic clearance of these agents were suspected.

131. MEASUREMENT OF PORTAL AND HEPATIC ARTERIAL BLOOD FLOW

T. NAKAMURA, S. NAKAMURA, T. AIKAWA, A. ONODERA, H. IIDA, and K. KERA

First Department of Internal Medicine, Tohoku University School of Medicine, Sendai

The portal and the hepatic arterial blood flow was measured from plateau concentrations in the arterial and the hepatic venous curves after continuous infusion of radioiodinated serum albumin into the pulmonary artery. Average ratio of the portal blood flow to the total hepatic blood flow was 85% in controls, 81% in chronic hepatitis, 63% in hepatic cirrhosis, 69% in primary hepatic carcinoma, and 76% in metastatic hepatic carcinoma. Normal range was assumed to be between 70 and 90%. The differences between hepatic cirrhosis and the controls and between hepatic cirrhosis and chronic hepatitis was statistically significant. The decreased ratio of the portal blood flow in hepatic cirrhosis showed no significant correlation to per cent intrahepatic shunt, the wedged hepatic venous pressure, per cent of interstitial tissue, morphological classification of cirrhosis, deformity in hepatic venograms, or presence of splenomegaly, hepatomegaly, or esophageal varices.

The portal blood flow calculated from the ratio and the total hepatic blood flow was significantly lower in hepatic cirrhosis than in chronic hepatitis, and was negatively correlated with the wedged hepatic venous pressure.

132. A NEW METHOD FOR MEASUREMENT OF THE RATIO OF HEPATIC ARTERIAL BLOOD FLOW AND PORTAL BLOOD FLOW USING TRANSUMBILICAL PORTAL CATHETERIZATION

Y. SHIMADA, T. ITOSHIMA, W. OHTA, T. NAGAI

The First Department of Internal Medicine, Okayama University Medical School

Transumbilical portal cathelerization was applied to the liver diseases. Portal venous pressure (PVP) was measured directly by this method. New caliculation method for the ratio of hepatic arterial blood flow and portal blood flow (A/P ratio) was deviced by use of following principle.

Dilution method was applied to the principle; orally administered I^{131} hippurate is absorbed into the portal blood, diluted in the liver with the arterial blood and flows into the hepatic venous blood. Each samples of portal blood, peripheral arteried blood and hepatic venous blood were obtained from the transumbilical catheter, peripheral arterial and hepatic venous catheter respectively, at every 5 minutes for 60 minutes. Then their radioisotope counts were measured.