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

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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

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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.

The areas outlined by radioisotope concentration curves of each blood samples were measured. A/P ratio was caliculated from following formula.

$$\frac{A}{P}=\frac{p-h}{h-a}$$

A : hepatic arterial blood flow
P : portal blood flow
a : the area outlined by radioisotope concentration curve of peripheral arterial blood samples
h : the area outlined by radioisotope concentration curve of hepatic venous blood samples
p : the area outlined by radioisotope concentration curve of portal blood samples

I^{131} hipprate excreted from the liver into the bile was within 0.5% of total hipprate which flows into the liver at the same period. Therefore, excretion rate of hipprate into the bile was negligible in this caliculation. Instead of total splanchinic oxygen consumption (TSOC), total hepatic oxygen consumption (THOC) was able to calicurated by use of A/P ratio.

The Results

1. PVP in 2 cases of acute hepatitis were 80 and 95 mm saline which were lower than wedged hepatic venous pressure (WHVP) of 110 and 150 mm saline respectively. PVP in 3 cases of chronic hepatitis (inactive form) were 180, 180 and 220 mm saline which were almost equal to WHVP. PVP in 2 cases of chronic hepatitis (active form) and a case of relapsing chronic hepatitis were 150, 170 and 220 mm saline which were slightly lower than WHVP of 160, 200 and 230 mm saline. PVP in 4 cases of liver cirrhosis were 170, 200, 220 and 200 mm saline which were equal, slightly higher or lower than WHVP of 170, 215, 205 and 280 mm saline.

2. A/P ratio were 59 : 41, 39 : 61 in two cases of chronic (active form), 66 : 34 in a case of relapsing chronic hepatitis, 44 : 56 in a case of chronic hepatitis (inactive form), and 74 : 26, 7 : 93 in two cases of liver cirrhosis.

3. TSOC and THOC were obtained: 49 and 41, 34 and 18 ml/min./M^2 in two cases of chronic hepatitis (active form), 52 and 50 ml/min./M^2 in a case of relapsing chronic hepatitis, 34 and 25 ml/min./M^2 in a cases of chronic hepatitis, and 65 and 57, 19 and 17 ml/min./M^2 in two cases of liver cirrhosis.

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133. HEMODYNAMIC EFFECTS OF HISTALOG AND GASTRIN IN THE STOMACH AND LIVER

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Hemodynamic effects of Histalog and Gastrin in the stomach and liver were observed in dogs and rats.

The gastric blood flow (GBF) and blood pressure (GAP) were measured modifying the Salmon's method and gastric circulation time (GCT) with T_{1824}. The gastric secretion rate (GSR) was also measured every 10 minutes. The pressure of portal and hepatic vein were observed by the previously reported method and the determinalion of the hepatic blood flow (HBF) was made by use of Au^{198} colloids. In rats, the changes of blood capillaries on the surfase of the stomach, intestine and liver were examined by a biomicroscope to evaluate the effects of these drugs. 2 mg/kg b. w. of Histalog and 20 μg/kg b. w. of Gastrin were individually administered in dogs intramusculary, and 10 mg and 50 μg in rats intraperitoneously. The results would be summarized as follows:

Observation in dogs;