

spleen accumulation became plateau. The blood samples were taken for measurement of their radioactivities. Then the images of the liver-spleen area by the two radio-colloids in the same preset counts were recorded. The radio-activities of ^{99m}Tc were subtracted by those of ^{198}Au until the liver counts became zero in order to delineate the splenic image. The rate constant of ^{99m}Tc -Sn colloid clearance was 2 to 2.5 times that of ^{198}Au in normals, and 2 to 3.5 times in splenomegaly. Significant reduction was not necessarily observed in the clearance rate of ^{99m}Tc . In order to obtain the clearance rate attributable to the liver and the spleen respectively, the following dual simultaneous equations were proposed and solved.

$$X_1 + Y_1 = 1 \quad (1)$$

$$X_2 + Y_2 = 1 \quad (2)$$

$$\frac{X_1}{X_2} = a$$

$$\frac{Y_1}{Y_2} = b$$

Where X_1 , Y_1 = Fractional amount of ^{198}Au colloid in the liver and the spleen (unknown). X_2 , Y_2 = Fractional amount of ^{99m}Tc -Sn colloid in the liver and the spleen (unknown). a , b = ratio obtained from counts of each radiocolloid in the same chosen area of the liver and the spleen. These analysis revealed that significant reduction in hepatic uptake rate actually exists among those cases in which blood clearance rate were not considerably reduced due to compensatory uptake of the colloid by the spleen. Therefore, this study is thought to be useful on diagnostic as well as therapeutic aspects.

Use of RADIOACTIVE MICROSPHERES to Assess Distribution of Cardiac Output in Experimental Liver Cirrhosis

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In order to clarify the hemodynamic mechanisms in liver cirrhosis, regional blood flow and arteriovenous shunting volume of each organ were measured in rabbits with CCl_4 induced liver cirrhosis by means of Rudolf's technique. The regional blood flow and the shunting blood flow were estimated by using two differently labeled batches microspheres of 15- μ -diameter with ^{141}Ce and 50- μ -diameter with ^{85}Sr . Cardiac output was calculated by RISA dilution method.

In cirrhotic rabbits, the cardiac output value was 5% higher than that in the control. In comparison with the control, the cirrhotic rabbits showed 10–24 percent decrease in blood flow (including shunting volume passing

through the arteriovenous anastomoses between 15 and 50 diameters) to the total splanchnic, kidney, heart and brain; while, there were increases in organ blood flow to the lung, adrenal and limbs.

Even in the control rabbits, slight degree of arteriovenous anastomosis with 15–50 μ diameters was found in kidney, brain, heart, small intestine, colon and cecum-appendix. In the cirrhotic rabbits, significant increases of shunting were found in the stomach, colon, spleen and limbs.

Thus, various hemodynamic changes occurred in each organ with liver cirrhosis. These data suggest that dysfunction of the various organs in liver cirrhosis is correlated with

these circulatory disturbance.

Diagnosis of Hepatobiliary Diseases Using ^{131}I -BSP Retention Ratio (20min/5min) and Scintigraphy

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In order to get a better diagnostic criteria of jaundices, we examined 51 cases (10 cases; normal, 17; acute and chronic hepatic diseases, 5; cholangiolytic hepatitis, 1; primary billiary cirrhosis, 18; billiary tract diseases) using ^{131}I -BSP blood retention ratio (20min/5min) and serial hepatobilliary scintigraphy. After intravenous injection of ^{131}I -BSP 100 μCi , serial hepatobilliary imagings were obtained at 5, 10, 30, 60, 120, 240 min, 24 hrs, post I.V., and 1 ml of venous blood was drawa at 5, 10, 20 min post I.V., and blood ratention ratio (20min/5min) were calculated.

Results; ^{131}I -BSP blood retention ratio (20min/5min) of various hepatobilliary disea-
ses were $20.9 \pm 6.9\%$ in normal cases, $27.5 \pm 14.9\%$ in nonicteric hepatocellular disorder, $68.9 \pm 18.8\%$ in icteric hepatocellular disorder, $61.3 \pm 25.1\%$ in intrahepatic cholestasis, $20.9 \pm 6.0\%$ in nonicteric extrahepatic bile duct diseases, $50.9 \pm 20.1\%$ in icteric extrahepatic

epatic billiary diseases.

^{131}I -BSP blood retention ratio and serial hepatobilliary scintigraphy were compared with clinical data, and we summarized the diagnostic criteria for the differentiation of hepatobilliary diseases as follows.

If blood retention ratio is over 85%, or 70—85% with excretion into gut on scintigram, it is diagnosed as medical jaundice.

A blood retention ratio between 70—85% without scan evidenee of isotope intestinal excretion indicates extrahepatic complete obstructive jaundice. A blood retention ratio under 40% with delayed isotope excretion into gut suggests extrahepatic bile duct disease, and blood etention ratio under 40% without delayed intestinal excretion is considered to be normal.

When blood retention ratio between 40—70%, it is impossible to differentiate whether it is a medical jaundice or not.

Tumor Scanning with Co-57-Bleomycin in the Carcinoma of the Liver and Pancreas

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Tumor scintigram using Co-57-Bleomycin

has been studied with hepatic and pancreatic