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Clinical need for both scintigraphy with technetium-99m GSA and per-rectal portal scintigraphy in some patients with chronic liver disease

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Scintigraphy with ^{99m}Tc-diethylenetriaminepentaacetate with galactosyl human serum albumin (^{99m}Tc-GSA) and per-rectal portal scintigraphy are useful for evaluating hepatic functional reserve and portal circulation, respectively. We did the procedures simultaneously in some patients to examine the relationship between hepatic functional reserve and portal circulation in chronic liver disease. Scintigraphy with ^{99m}Tc-GSA was done in 10 healthy subjects, 45 patients with chronic hepatitis, and 165 patients with cirrhosis. Fifty-seven patients (13 with hepatitis and 44 with cirrhosis) also underwent per-rectal portal scintigraphy with ^{99m}Tc-pertechnetate within two weeks. A receptor index was calculated by dividing the radioactivity of the liver region of interest (ROI) by that of the liver-plus-heart ROI at 15 min after the injection of ^{99m}Tc-GSA. The index of blood clearance was calculated by dividing the radioactivity of the heart ROI at 15 min by that of the heart ROI at 3 min. A solution containing ^{99m}Tc-pertechnetate was instilled into the rectum, and serial scintigrams were taken while radioactivity curves for the liver and heart were recorded sequentially. A per-rectal portal shunt index was determined by calculating the ratio of counts for the liver to counts for the heart integrated for 24 seconds immediately after the appearance of the liver time-activity curve. The median receptor index was lower for more severe liver disorders, increasing in the order of chronic hepatitis, compensated cirrhosis and decompensated cirrhosis, and the median index of blood clearance was higher. The median receptor index was significantly lower when a complication (varices, ascites, or encephalopathy) was present, and the median index of blood clearance was higher. The shunt index was correlated significantly with the two other indices, but these values for some one-third of the patients disagreed in either indices. Scintigraphy with ^{99m}Tc-GSA and per-rectal portal scintigraphy with ^{99m}Tc-pertechnetate are both needed for accurate assessment of the severity of chronic liver disease before treatment-making decisions, because in some patients, results are not correlated.

Key words: ^{99m}Tc-GSA, per-rectal portal scintigraphy, cirrhosis of the liver, portal circulation