

The functional hepatic volume assessed by ^{99m}Tc -GSA hepatic scintigraphy

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The accuracy of measurement of the functional hepatic volume by single photon emission computed tomography (SPECT) with ^{99m}Tc -galactosyl serum albumin (^{99m}Tc -GSA) was evaluated. ^{99m}Tc -GSA planar scintigraphic images were obtained dynamically and the hepatic SPECT imaging was then performed in 25 patients with hepatobiliary tumors. The patients were divided into 4 groups with normal hepatic function, and mild, moderate and severe hepatic dysfunction. The functional hepatic volume determined by SPECT was compared with the morphological hepatic volume determined by computed tomography. The ratio of the hepatic volumes obtained by the two methods was calculated. The mean hepatic volume ratio was $96.6 \pm 2.3\%$ in the normal hepatic function group and $95.9 \pm 2.2\%$ in the mild dysfunction group (n.s.). In both the moderate and severe hepatic dysfunction groups, the hepatic volume ratio was smaller than that in the normal group ($87.9 \pm 5.2\%$, $p < 0.001$, and $71.9 \pm 7.6\%$, $p < 0.0001$, respectively). There was a linear correlation between the hepatic volume ratio and various indices of reserve hepatic function, such as LHL_{15} ($r = 0.83$, $p < 0.0001$), HH_{15} ($r = 0.74$, $p < 0.0001$), and ICG_{15} ($r = 0.75$, $p < 0.0005$). These results indicate that the hepatic volume ratio is proportional to the severity of hepatic dysfunction, and suggest that the functional hepatic volume measured with ^{99m}Tc -GSA faithfully reflects the functioning hepatocyte mass. ^{99m}Tc -GSA scintigraphy and hepatic SPECT therefore provide information regarding global and regional reserve hepatic function.

Key words: ^{99m}Tc -galactosyl serum albumin (^{99m}Tc -GSA), ^{99m}Tc -GSA scintigraphy, hepatic SPECT, functional hepatic volume, reserve hepatic function