Annals of Nuclear Medicine Vol. 17, No. 1, 61–67, 2003

^{99m}Tc-GSA liver dynamic SPECT for the preoperative assessment of hepatectomy

Katashi SATOH,* Yuka YAMAMOTO,* Yoshihiro NISHIYAMA,*
Hisao WAKABAYASHI** and Motoomi OHKAWA*

**Department of Radiology and **First Department of Surgery,*
Faculty of Medicine, Kagawa Medical University

Objective: The purpose of the present study was to devise a predictive index to predict residual liver function before hepatic resection, using technetium-99m diethylenetriamine-penta-acetic acid-galactosyl human serum albumin (^{99m}Tc-GSA) liver dynamic single photon emission computed tomography (SPECT). ***Methods:*** Fifty-seven patients with liver disease underwent liver dynamic SPECT with ^{99m}Tc-GSA. Dynamic SPECT was performed to obtain the k-value according to the accumulation curve after injection of ^{99m}Tc-GSA. The k-value is a mathematical reflection of the rate of disappearance of the circulating radiotracer as it is accumulated into the hepatocytes. We devised an original predictive residual index (PRI) by combining k-value with liver volume (V) and functional liver volume (FV). Correlation between these parameters and results of liver function tests and the grade of liver disease severity was analyzed. We investigated retrospectively the correlation between PRI and post-operative patient prognosis. ***Results:*** The k-value slightly correlated with indocyanine green clearance test at 15 mins, bilirubin level and hepaplastin test. FV and V did not correlate with liver function tests. Post-operative complications were observed in 5 patients. The PRI of these patients was below 0.37. When PRI was above 0.38, no patient had hepatic failure. ***Conclusions:*** When PRI is above 0.38, there is a low probability of hepatic failure after hepatectomy. The PRI is useful in preoperative prediction of post-hepatectomy residual liver function in patients with liver disease.

Key words: liver cancer, ^{99m}Tc-GSA, dynamic SPECT, liver function, predictive index