

An easy and reproducible semi-automatic method for the evaluation of ^{99m}Tc -galactosyl human serum albumin

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^{99m}Tc -galactosyl human serum albumin (^{99m}Tc -GSA) scintigraphy is a new method for evaluating liver function. This scintigraphy is useful for evaluating the severity of liver diseases. The indices evaluating hepatic function include the receptor index (LHL15) and the index of blood clearance (HH15). These indices are calculated on the basis of the regions of interest (ROIs) for both whole liver and heart, and are susceptible to the ROIs over heart and liver. At present, there is no standard method for determining ROIs. We attempted to establish a standard method which shall not be subject to inter and/or intra operator variation. A computer program to determine heart and liver ROIs semi-automatically was developed. Ten patients (12 instances) were studied with ^{99m}Tc -GSA, and HH15 and LHL15 were calculated on the basis of the ROIs obtained manually and semi-automatically by 3 different operators independently. Blood sampling and gamma-counting yielded blood clearance data. The ICG R15 was compared with each index in 34 patients. The time needed for ROI determination was reduced from 2-3 minutes for the manual method to 0.5-0.8 minutes for the semi-automatic method. The % coefficients of variation (% CVs) of HH15 and LHL15 were improved in the order manual-inter observer (M-inter), manual-intra observer (M-intra) and semi-automated-inter observer (SA-inter); % CVs of HH15 were 2.26% for M-inter, 1.55% for M-intra and 0.07% for SA-inter, and % CVs of LHL15 were 2.29% for M-inter, 0.46% for M-intra and 0.07% for SA-inter. The correlation of HH15 and LHL15 among M-inter, M-intra and SA-inter was good. Comparison of indices obtained by manual and semi-automatic methods with blood clearance data obtained by blood sampling and gamma-counting showed good correlations and no significant differences. The comparison with ICG R15 showed that HH15 and LHL15 by the semi-automated method gave better correlation than that by the manual method. A newly developed semi-automated method improved data processing time and deviation of indices in ^{99m}Tc -GSA studies. This method should substitute for manual ROI determination.

Key words: liver function, ^{99m}Tc -GSA, semi-automatic method