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Simple scintigraphic parameters with Tc-99m galactosyl human serum albumin for clinical staging of chronic hepatocellular dysfunction

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Technetium-99m labeled diethylenetriaminepentaacetic acid (DTPA)-galactosyl human serum albumin (GSA) has been used for hepatocellular functional evaluation. This study proposed new and simple parameters to overcome the limitations of conventional parameters, and they were applied to the clinical staging of chronic liver dysfunction. The study group consisted of 93 patients including 81 with liver dysfunction and 12 control patients. In addition to the two conventional parameters, namely, receptor index (LHL15 = liver count divided by the sum of liver and heart counts at 15 minutes) and clearance index (HH15 = heart count at 15 minutes divided by the heart count at 3 minutes), 6 new parameters for Tc-99m GSA uptake and clearance were generated. The conventional receptor index of LHL15 showed a large variation depending on the size of region of interest (ROI) over the heart. The LHL15 normalized by the ROI size (nLHL15) showed more stable data and a better separation of mild liver dysfunction. A hyperbolic relationship between the LHL15 and HH15 changed to a linear relationship by using the nLHL15 index. The combination of the liver to heart average count ratio at 15 minutes (LH15) and T-half (minute) of the heart count also could differentiate each stage well. In conclusion, the use of the ROI-area normalized nLHL is recommended instead of the conventional LHL15. The indices of LH15 and T-half could be alternatively used as practical parameters for clinical staging in liver function.

Key words: Tc-99m galactosyl human serum albumin, asialoglycoprotein, receptor imaging, hepatocellular dysfunction, clinical staging