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Evaluation of asialoglycoprotein receptor imaging agent as a marker of hepatic ischemia-reperfusion injury and recovery

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Protection of hepatocytes from ischemia-reperfusion injury is a clinically important issue. The purpose of this study was to evaluate changes in acute liver damage and recovery after ischemia-reperfusion in rats with asialoglycoprotein receptor (ASGP-R) ligand. Ischemia was induced by clamping the hepatoduodenal ligament for 90 min. At 1, 3, 24, 48 hr, 1 and 2 wk after reperfusion, I-125-GSA was injected. Five min after injection, blood samples were obtained and the liver was removed. Several regions from each lobe were dissected, weighed and counted. Mean uptakes (% dose/g) in the liver and blood samples were calculated. Histologic sections stained with hematoxylin-eosin (H-E) stain showed ischemic damage at 1 and 3 hr, and focal hepatocyte necrosis at 24 hr. Predominant massive necrosis was not seen. The mitotic index with H-E stain and proliferating cell nuclear antigen (PCNA) labeling index were highest at 1 wk, indicating liver regeneration. At 1 and 3 hr, liver uptake was significantly decreased, and blood uptake was significantly increased, indicating decreased tissue blood flow and ischemic damage. Liver uptake showed significant increases at 48 hr and 1 wk, and was the highest at 1 wk, indicating liver regeneration during the convalescence stage. ASGP-R binding may provide valuable information on ischemia-reperfusion injury and recovery.

Key words: liver, asialoglycoprotein, ischemia and reperfusion injury, liver regeneration, ^{99m}Tc-DTPA-galactosyl human serum albumin (^{99m}Tc-GSA)