

Pharmacokinetic analysis of ^{123}I -labeled medium chain fatty acid as a radiopharmaceutical for hepatic function based on beta-oxidation

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Beta-oxidation is the most important pathway to provide energy for the liver. Our recent findings indicated that radiolabeled medium chain fatty acid analogs could be used as radiopharmaceuticals in the liver, allowing us to monitor alterations in energy metabolism on the cellular level. In the present study, pharmacokinetic analysis of a radioiodinated medium chain fatty acid analog, *p*-[^{123}I]iodophenylantric acid ([^{123}I]IPEA), was carried out in normal and hepatitis model rats to investigate the index for the measurement of beta-oxidation activity in hepatocytes. The rate constant for metabolism of [^{123}I]IPEA in the liver showed a strong correlation with the ATP level, which was determined as an indicator of beta-oxidation activity in hepatocytes. The radioactivity profile in the liver after [^{123}I]IPEA administration provided important information regarding hepatic viability, and the metabolic rate constant of [^{123}I]IPEA calculated by a pharmacokinetic method was a useful criterion for hepatic diagnosis based on hepatic cellular energy metabolism.

Key words: medium chain fatty acid, beta-oxidation, pharmacokinetic analysis, hepatic function, SPECT