

Summary

Development of a Simple Method for the Washout Correction of ^{123}I -IMP SPECT and Its Application to a Quantitative rCBF Method

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We have developed a simple method to correct the washout of tracer from the brain based on the two-compartment model in brain early SPECT using N-isopropyl-p-[^{123}I]iodoamphetamine (^{123}I -IMP). This correction was applied to a new quantitative method of regional cerebral blood flow (rCBF) in combination with the microsphere method by continuous arterial sampling previously reported. Data acquisition of ^{123}I -IMP early SPECT was started from 35 min after ^{123}I -IMP i.v. injection, and the time activity curve of whole brain on anterior head planar images was monitored immediately after ^{123}I -IMP i.v. injection for the correction of washout of tracer from the brain. The usefulness of this method was evaluated in 12 patients

with various brain diseases by comparison with the results obtained from the super-early SPECT at 7–10 min after ^{123}I -IMP i.v. injection. The washout rates in cases of early SPECT corrected by this method ranged from 16.91% to 39.34% with a mean \pm SD of $27.72 \pm 5.44\%$. The contrast of hypo- to hyperperfusion regions on early SPECT was improved by the correction of the washout, and its intracerebral distribution was similar to the simultaneously obtained super-early SPECT images. These results indicated that the present correction method for the washout was useful for more correct quantification of rCBF.

Key words: ^{123}I -IMP, rCBF, Two-compartment model, SPECT.