Early and delayed imaging with $^{123}$I-IMP SPECT in patients with ischemic cerebrovascular disease

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Cerebral blood flow imaging with N-isopropyl (I-123) p-iodoamphetamine (IMP) was performed in 44 patients with ischemic cerebrovascular disease (CVD) at an acute or subacute stage less than 30 days from the onset. IMP imaging was obtained at 20 minutes (early scan) and 4 hours (delayed scan) after intravenous injection of 222 MBq of IMP. The region of interest (ROI) was selected in a slice compatible with the findings on the CT images, and the lesion to tissue ratio (L/T ratio) was calculated in a comparison with the unaffected side. The redistribution index (RI) was also calculated by dividing the difference between the L/T ratio in early and delayed image by the L/T ratio in early image. The patients were classified into three groups (Grade 1, 2, 3) on the basis of the CT findings. The L/T ratio in the delayed images and RI was high in grade 1 and 2 groups and low in grade 3 groups both in early and delayed scans. The RI had tendency to grow high as the days after the onset became later. In the duration period from 4 to 7 days, ‘reversed’ redistribution was observed in 4 cases. Follow up examinations were performed in 6 cases in grade 3 group. The RI became higher in 3 cases and lower in 3 cases in the second examination.

In conclusion, good redistribution was observed in grade 1 and 2 groups, and the prognosis was good. On the other hand, poor redistribution was observed in grade 3 group. There was little relationship in the degrees of redistributions or ‘reversed’ redistribution between the first and second examination in grade 3 group.

Key words: $^{123}$I-IMP SPECT, Cerebrovascular disease, Cerebral blood flow, Reversed redistribution, Redistribution