COMPARISON BETWEEN THE IMAGE OF (N-ISOPROPYL-P-1-123-IODOAMPHETAMINE (IMP)) AND
REGIONAL CEREBRAL BLOOD FLOW (rCBF) BY Xe-133 INHALATION METHOD.

H. Fujie, T. Tsujimoto, S. Chir, Y. Nagamoto, M. Yamamoto, Y. Tsukazaki, N. Shirahata, N. Sone, A. Hakuba, S. Nishimura, A. Saizaki, H. Ikeda, Y. Inoue, H. Ochi, and Y. Onoyama, Hospital, Yamamoto-Daisan Hospital, Department of Neurosurgery, and Radiology, Osaka University of Medical School.

We compared N-isopropyl-p-I-123-iodoamphetamine (IMP) studies to regional cerebral blood flow (rCBF) studies with Xe-133 gas inhalation method in 3 normal volunteers and in 10 patients (infarction, hematoma 3).

Method: The single photon emission computed tomography (SPECT) was done with HR-DOME II. IMP images were obtained immediately after an intravenous injection of 3mCi of IMP with high resolution mode, and data were collected for 15 minutes. rCBF study was performed using the high sensitivity mode with patients inhaling 20mCi per liter Xe-133 gas for minute. Data were obtained for 10 minutes.

Result: Our study demonstrated that IMP images showed ischeimic areas and areas of hematoma more clearly than rCBF study (better spatial resolution). The IMP distribution on the early scan was similar to the rCBF images.


N-isopropyl-p-[I-123]iodoamphetamine (IMP) is a radiopharmaceutical which can be used to evaluate regional cerebral perfusion when it is combined with SPECT. Both SPECT of the brain with IMP and the local cerebral blood flow (LBF) measurement with Xe-133 were performed in 7 subjects: three cases with moyamoya disease, two cases with stenosis of the middle cerebral artery, one case with occlusion of the internal carotid artery and one case with normal pressure hydrocephalus.

Good agreement was found between the SPECT with IMP and the Xe-133 LCBF studies. Although SPECT with IMP is capable of providing LCBF findings with higher resolution, the Xe-133 study seems to be an additional choice of method to get quantitative information.


N-isopropyl I-123 P-iodoamphetamine (IMP) has high lipid solubility and high first-pass extraction ratio, whose distribution has been reported to reflect regional cerebral blood flow at the time of injection. We applied this agent to patients with cerebral infarction. Twelve cases were studied. The region of abnormality turned out to be larger on IMP-SPECT than on X-CT in all cases including four cases in which IMP-SPECT revealed perfusion deficit area in spite of no abnormality on X-CT. In eight cases, the phenomenon of crossed cerebellar diaschisis was observed. Severe and large decreased perfusion area in parietal lobe proved to be characteristic. In four cases in which this phenomenon was not found, perfusion to the parietal lobe was preserved comparatively. In conclusion, I-123 IMP-SPECT is sensitive enough to detect remote effect and the parietal lobe seemed to play an important role in the development of crossed cerebellar diaschisis.