PRELIMINARY PERFORMANCES OF BRAIN BLOOD FLOW SCINTIGRAPHY BY I-123 IMP. H.Hoshi, S.Ono,K.Watanabe, Department of Radiology, Miyazaki Medical College, S.Jinnouchi, Department of Radiology, Miyazaki Higashi Byoin National Sanatorium. T.Ueda, K.Kinoshiba, Department of Neurosurgery, Miyazaki Medical College.

Basic studies of SPECT image by rotating gamma camera and circular-detector array hybrid emission computed tomography using I-123 were reported. Instruments used were MaxiCamera 400T(G.E.) as a rotating gamma camera and HEADTOME SET-020 (Shimatzu) as a circular-detector array hybrid gamma camera. Phantom for uniformity is cylindrical shape (20cm in diameter and 10cm in height) filled with I-123 solution of 0.3 [μCi/ml] in density. Bar phantom for spatial resolution is arranged 4 types of acrylic rod (0.75, 1.0, 1.5 and 2.0 [cm] in width). Sensitivities are 2607 [cps/μCi/ml/slice] in MaxiCamera 400T using low energy collimator (LEGP), 3176 in MaxiCamera using medium energy collimator (MESP) and 10166 in SET-020. Uniformity is better in rotating gamma camera than in circular-detector array hybrid camera. Spatial resolutions are 1.5 [cm] in MaxiCamera 400T and 0.75 [cm] in SET-020 by SPECT image of bar phantom. Spatial resolution get worse with the increase of contamination of I-123.


The purpose of this study is to evaluate the clinical utility of single photon emission computed tomography (SPECT) with N-iso-proply(I-123)idoamphetamine (IMP) in cerebrovascular diseases compared with X-ray CT scans. Thirty-six patients with cerebrovascular disease were studied. SPECT was performed using a rotating gamma camera or a whole body multislice SPECT scanner. Data collection started at 15 to 20 minutes after intravenous injection of IMP (3 mCi). X-ray CT scan was performed within a few days. Focal decrease of IMP was observed in 31 cases (86%), and 23 other cases (74%) showed more extensive changes than X-ray CT abnormalities. No regional changes were observed in the other 5 cases, in which X-ray CT scan revealed only small abnormalities or normal findings. Crossed cerebellar diaschisis was observed in 15 cases, in which 12 had cerebral infarction due to the occlusion or stenosis of major cerebral arteries.

These results suggested that SPECT with IMP was effective to evaluate the abnormal cerebral perfusion, although X-ray CT was more sensitive to detect localized small abnormalities.

A STUDY OF REGIONAL CEREBRAL BLOOD FLOW IMAGING USING N-ISOPropyl-p(I-123)IDOoAMPHEtAMINE, K.Ikekubo, H.Tochio, H.Yamaguchi, Y.Saki, H.Ito, T.Higa, T.Tanaka, T.Komatsu, Department of Nuclear Medicine and Department of Neurology, Kobe General Hospital, Kobe.

A recently developed radiopharmaceutical, N-iso-propyl-p(I-123)idoamphetamine (IMP), enabled non-invasive clinical evaluation of regional cerebral blood flow (rCBF) by simple intravenous administration. Single-photon emission computed tomography (SPECT) was performed in 20 patients with various cerebrovascular diseases using a rotating gamma camera after an intravenous injection of IMP. Three patients with internal carotid occlusion and one with ruptured arteriovenous malformation showed larger areas of reduced rCBF than the corresponding areas of reduced attenuation on X-ray computed tomograms (XCT). Otherwise IMP-SPECT and XCT showed comparable expansion of lesions. Precise demonstration of rCBF changes indicated further clinical usefulness of IMP-SPECT. Necessity of improvement in radiochemical purity of IMP and in geometry of scintillation detector to patient’s head is discussed for more image quality of IMP-SPECT.