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PRELIMINARY PERFORMANCES OF BRAIN BLOOD FLOW SCINTIGRAPHY BY I-123 IMP.

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Basic studies of SPECT image by rotating gamma camera and circular-detector array hybrid emission computed tomograph 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. Pantom for uniformity is cylindrical shape (20cm in diameter and 10cm in hight) filled with I-123 solution of o.3[μCi/ml] in density. Bar phantom for spacial resolution is arranged 4 types of acryl board (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. Uniformities are 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-124.

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THE CLINICAL UTILITY OF SINGLE PHOTON EMISSION COMPUTED TOMOGRAPHY WITH N-ISOPROPYL-p-(I-123)IODOAMPHETAMINE IN CEREBROVASCULAR DISEASES.

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The purpose of this study is to evaluate the clinical utility of single photon emission computed tomography (SPECT) with N-isopropyl-p-(I-123)iodoamphetamine (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 of them(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.

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REGIONAL CEREBRAL BLOOD FLOW AFTER STROKE MEASURED BY N-ISOPROPYL-P(I-123) IODO-AMPHETAMINE.

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N-isopropyl-p(I-123)Iodoamphetamine-(IMP) is currently used as a SPECT tracer for the measurement of cerebral blood flow (CBF). To see the clinical usefulness of the IMP as a CBF tracer, we studied 10 patients with cerebral vascular diseases. SPECT scan was performed using GE Maxi 400T Camera after the intravenous injection of IMP (3mCi). Our study confirmed the following, 1) the ischemic lesion after stroke could be evaluated in the early stages even before CT showed any abnormality, 2) the remote effect such as transcerebellar diaschisis was visualized, 3) IMP was more efficient to disclose the lesion responsible for the neurological signs and symptoms, 4) the lesion responsible for the focal epilepsy was detected even during the interictal period, 5) IMP study was helpfull to evaluate the benefit of the surgical treatment such as STA-MCA anastomosis. Since the distribution of IMP in the brain is dependent on both the CBF and the function of the amine receptor, caution should be taken in the interpretation of IMP images for the pathological tissue in which the dissociation between flow and metabolism may be possible.

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A STUDY OF REGIONAL CEREBRAL BLOOD FLOW IMAGING USING N-ISOPROPYL-P-(I-123) IODOAMPHETAMINE(IMP).

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A recently developed radiopharmaceutical, N-Isopropyl-p-(I-123)Iodoamphetamine(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 arterio-venous 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 scintilation detector to patient's head is discussed for more image quality of IMP-SPECT.