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In brain perfusion images using N-isopropyl-p-iodoamphetamine and rotating gamma camera ECT, brain maps showing laterality indices (LI) were made for the purpose of detecting interhemispheric differences. Left (L) and right (R) lateral images were made by adding sagittal section images in each hemisphere, respectively. LI was calculated as follows. LI =100X[1+(R-L)/(R+L)]. The normal ranges (mean±SD) of the indices determined by those obtained in five normal right-handed subjects were 103±4 and 103±10 for brain mean and each pixel, respectively. Out of 42 measurements in 36 right-handed patients with cerebrovascular accidents, brain mean LI beyond the normal limits and areas showing abnormal regional LI were observed in 11 (26%) and 35 (83%) measurements, respectively. On the other hand, X-ray CT showed low density areas in only 18 (36%). These brain maps were clinically useful for detecting and quantifying interhemispheric differences.

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For the purpose of investigating the pathophysiology of cerebrovascular disorders, cerebral circulation parameters were measured using N-isopropyl-p-(1-123)-iodoamphetamine (IMP), Tc-99m labeled red blood cell (To-REC) and Tc-99m labeled albumin (To-HSA) by SPECT. These parameters include cerebral blood flow (CBF), cerebral blood volume (CBV), intracranial hematocrit (ICH) and mean transit time index (MTT) index. CBF measurements were made by IMP intra-venous injection and arterial input sampling. ICHT were calculated by operations of To-REC images and (To-REC + To-HSA) images. Using the ICHT, CBV were calculated from To-REC images and peripheral venous blood counting. Then MTT indices were calculated from CBV divided by CBF. The normal values of ICHT and CBV (parietal region) determined by those obtained in four normal subjects were 0.87 X peripheral venous hematocrit and 4.1 ml/100g, respectively. In a 61 y.o. female patient with subarachnoid hemorrhage from rupture of left ophthalmic aneurysm (post-clipping), MTT indices at basal ganglia level were 12.8, 9.8, 4.8, 5.9, 4.2 and 3.8 sec. for left frontal, right frontal, left temporal, right temporal, left occipital and right occipital regions, respectively. It is interesting that MTT indices has a certain correlation to oxygen extraction fraction.

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We investigated for quantitative measure-
ment of cerebral blood flow by intra-
venous injection of 123I-IMP.

The objects of this study are 18 cases; 2 normals and 16 apoplexies. We had SPECT images at 17-24 minutes after injection of 3 mCi-123I-IMP for static scan by HEAD-
TOME-II. Arterial sampling started at
same time of intravenous injection, and measured for 123I-IMP that input to the
brain, and then extracted unmetabolised
IMP from the arterial blood.

Anotherwise, accumulated 123I-IMP to
the brain measured by HEADTOME-II images. Beforehand, corrected the HEADTOME-II and well counter for measurement of blood activity and correction for absorption of HEADTOME-II used for AIZAWAs method. We measured for cerebral blood flow by 123I-IMP counts in arterial blood and brain, conformed to Microsphere model by Kuhl etc. Mean normal value of whole brain is about 42.1 ml/100 g/min, closely resemble to 47.2±5.4 by Kuhl. Blood flow in white matter is low than usual reported count. We left over scope for investiga-
tion for examination.

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We investigated of quantitively for cerebral blood flow compared 123I-IMP-
SPECT with C15O2-PET.

The objects are 16 cases included nor-
al cases and 14 apoplexies. The machine are HEADTOME-II and III. On intravenous 123I-IMP method, we measured cerebral blood flow conformed to Microsphere model with 123I-IMP activity in arterial blood and the head. And, on the C15O2-PET study, measured cerebral blood flow con-
formed to To-steady state model. Normal values by 123I-IMP are 42.1 ml/100 g/min (mean count of whole blood), thalamus; 33.0 and white matter; 12.8. Anotherwise, on C15O2 study, the counts are 45.6, 43.1 and 21.9. Values by 123I-IMP method lower than C15O2 study.

We considered the consequence of dif-
fences for calculation model, examina-
tion method, partial volume effect, ab-
sorption correction and contamination of 123I. We left for ability to investigate the 123I-IMP study, but compare with the other SPECT-images, 123I-IMP-images have good resolution.