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 = 100{X(R-L)/(R+L)}. The normal ranges (mean±2sd) 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. The normal ranges for the purpose of detecting interhemispheric differences for cerebral blood flow (CBF), cerebral blood volume (CBV), intracranial hematocrit (ICH) and mean transit time index (MTT index) were calculated by operations of To-REC images and (To-REC + To-HSA) images. Using the ICH, CBV were calculated from To-REC images and peripheral venous blood counting. Then MTT indices were calculated from CBF divided by CBV. The normal values of ICH and CBV (parietal region) determined by those obtained in four normal subjects were 0.87 by 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.

We investigated for quantitative measurement of cerebral blood flow by intravenous injection of $^{123}$I-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 HEAD-TOME-II images. Beforehand, corrected the HEAD-TOME-II and well counter for measurement of blood activity and correction for absorption of HEAD-TOME-II used for AIZAWA's 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 lower than usual reported count. We left over scope for investigation for examination.

We considered the consequence of differences for calculation model, examination method, partial volume effect, absorption correction and contamination of 123I. We left for ability to investigate the 123I-IMP study, but compared with the other SPECT-images, 123I-IMP-images have good resolution.