such as CO₂ inhalation, hyperventilation, the elevation of blood pressure and the compression of contralateral common carotid artery.

In a case with normal brain, the hemispheric cerebral blood flow (HCBF) was 62 ml/100 g/min and the rCBF were high in the parietotemporal region. After CO₂ inhalation, the HCBF and rCBF markedly increased in the most region. In another case with normal brain, the HCBF was 63 ml/100 g/min and the rCBF were also high in the parietal region. After the elevation of blood pressure from 116/82 to 140/110 by the infusion of angiotensin, the HCBF and rCBF did not change significantly, showing the autoregulation of CBF. In a case with arteriovenous malformation, the rCBF in the lesion were low at rest and increased less than that in the normal region after CO₂ inhalation. In a case with parasagittal meningioma, the rCBF in the lesion were high at rest and inversely decreased in contrast to increasing in the normal region after CO₂ inhalation. In a case with the occlusion of left middle cerebral artery complicated by major stroke, the rCBF were remarkably low in the perfusion area of the artery. After CO₂ inhalation, the rCBF increased in the temporal region and decreased in the fronto-parietal region. In a case with left-sided cerebral thrombosis without angiographical findings, the rCBF decreased remarkably in the left parieto-temporal region after the compression of right common carotid artery.

The rCBF were demonstrated clearly by our functional image. Consequently, the rCBF functional image was useful for understanding the brain circulation and evaluating the treatments.

Regional Brain Functional Image Using Computerized Multicrystal Scintillation Gamma Camera (System-70)


*Department Radiology, Kansai Medical University
**Department of Neurosurgery, Kansai Medical University

Measurements of Regional Cerebral Blood Flow and preparation of Brain Functional Images were attempted with System-70 and H/A Method. The System-70 is unique in having a Multicrystal Detector, which is a matrix consisting of 21 rows and 14 columns of columnar crystal elements, each measuring 0.8 × 0.8 × 3.8 cm. 5 mCi of 133-Xe is injected in Bolus into an internal carotid artery of a patient. Simultaneously counting is made over the diseased region for 11 minutes at the rate of 1 sec/frame. Calculation between frames and normalization of counts against pre-determined ones are possible by “Data Process”. We modified collimators to obtain better geometry and succeeded in improving images. H₀ and H₁₀ were derived from values of Acc. interval (set at 20 sec). This proved to be quite satisfactory for clinical use. The display of Functional Images in 16 shades of color and further, their normalization made comparison of pre- and post-operative conditions etc. easier and were proved to be clinically useful.

The Computer Treatment of Brain Scintiphogram

Y. Hayashi, S. Sasaki, Y. Hosonuma

Department of Radiology, The Kanagawa Rehabilitation Hospital

We originated the new program of on-line mini-computer method for improving the diagnostic quarity of brain images by scintillation camera system and applied this program to phantoms and patients.

We reported it was the effectual method in