ellipse, while these were irregular in glioblastomas.

3) Densiti [RI accumulation ratio per unit volume (% dose/cm^3)]:

This is calculated from the following equation:

$$\%\ \text{dose/cm}^3 = \frac{\text{number of counts in lesion/cm}^2\text{—number of counts in background/cm}^2}{\text{size of lesion (cm)}} \times \frac{\text{radioactivity in the sphere phantom } (\mu\text{Ci})}{\text{number of counts in the sphere phantom}} \times \frac{\text{weight of patient's body}}{\text{weight of standard's body}} \times \frac{100}{\text{dose of } {}^{99m}\text{TcO}_4\text{—administrated } (\mu\text{Ci})}$$

Though only density of lesion was not very useful to make differential diagnosis, it appeared that change of density with time was important factor.

It is well known that glioblastomas and metastases are visualized best on delayed scans and this could to be related that in these lesions not only tumor to brain ratio but absolute RI accumulation was higher on delayed scans than initial scans.

An Improved Method of the Measurement of Regional Cerebral Blood Flow

T. Aoyama, Y. Yamauchi, Y. Sugitani, K. Kimura and T. Nukada

First Department of Internal Medicine, Osaka University Medical School, Osaka

Y. Kusumi

Department of Radiology, Osaka University Medical School, Osaka

The method of data acquistion and analysis of regional cerebral blood flow (rCBF) using gamma-scintillation camera had been reported.

Data processing system consists of the teletypewriter, the magnetic tape, a cathode ray tube (CRT), and a minicomputer with 8K words core memory. Radioisotope pulses from the gamma-scintillation camera are accumulated in the core memory for the settled sampling time and then transfered to the magnetic tape succesively. The interesting areas can be determined by CRT display of brain scintigram at will. Each clearance curves can be displayed on CRT in linear scale or semilogrithmic scale, for the sake of recognition of arterial spike, shunt peak, and tissue peak.

The raw clearance data consist of one second sampling data during first 1 to 3 minutes and 10 seconds sampling data during the following time.

The calculations of rCBF parameters are done as follows:

The point of maximum counts is identified, the next four points are skipped, and the fifth datum point after the peak is the first one used in the analysis.

Before the calculation of rCBF (initial), rCBF (10 min.), rCBF (gray), and rCBF (white), one second sampling data are converted to 10 seconds sampling data.

An attempt is made to correct the remaining activities for previous measurement.

The initial slope index is calculated from the slope of the best fitting line to the initial 2 minutes curve taken logarithmically.

The 10 minutes height-over area index of rCBF is also calculated.

The slow component determination in two compartment analysis is done by calculating the regression line during 8 to 10 minutes data of the clearance curve taken semilogarithmically. The fast component determination in this analysis is done by the subtraction of slow component clearance curve from original one.

The on-line acquistition and analysis of Xe-133 clearance curves allow the immediate utilization of the results of cerebral blood flow.