

Summary

Measurement of Cerebral Blood Flow the Blood Sampling Method Using ^{99m}Tc -ECD: Simultaneous Scintigram Scanning of Arterial Blood Samples and the Brain with a Gamma Camera

Takenori HACHIYA*, Atsushi INUGAMI*, Hidehiro IIDA**, Yoshihiko MIZUTA***,
Takeshi KAWAKAMI*** and Minoru INOUE***

**Division of Radiology and Nuclear Medicine, Rehabilitation Center for Physically Disabled Persons
and Medical Center for Mental Health-Akita*

***Department of Radiology and Nuclear Medicine, Akita Research Institute of Brain and Blood Vessels*

****Daiichi Radioisotope Laboratories, LTD.*

To measure regional cerebral blood flow (rCBF) by blood sampling using ^{99m}Tc -ECD we devised a method of measuring the radioactive concentration in arterial blood sample with a gamma camera. In this method the head and a blood sample are placed within the same visual field to record the SPECT data of both specimens simultaneously. The results of an evaluation of the counting rate performance, applying the 30 hours decaying method using ^{99m}Tc solution showed that this method is not comparable to the well-type scintillation counter and in clinical cases the active concentration in arterial blood sample remained well

within the dynamic range. In addition, examination of the influence of scattered radiation from the brain by the dilution method showed that it was negligible at a distance of more than 7.5 cm between the brain and the arterial blood sample. In the present study we placed a head-shaped phantom next to the sample. The results of the examinations suggested that this method is suitable for clinical application, and because it does not require a well-type scintillation counter, it is expected to find wide application.

Key words: Cerebral blood flow, Arterial blood samples, Simultaneously, Gamma camera, SPECT.