

83

CEREBRAL BLOOD FLOW MEASUREMENT BY RING TYPE ECT. H.Izunaga,A.Kojima,Y.Hirota and M.Takahashi,Department of Radiology, Kumamoto University School of Medicine, Kumamoto

Cerebral blood flow was measured with use of a ring type ECT (Shimadzu SET-010) on normal patients and patients with cerebrovascular diseases. Attention was paid to whether or not this measurement was useful for pre- and post-operative evaluation of these patients. Radionuclides used were Xe-133 and I-123 iodoamphetamine. These isotopes were injected intravenously.

Normal mean CBF of the cerebral hemispheres was 45 ± 5 ml/100mg/min, which was obtained by the measurements on normal volunteers. Mean CBF of the cerebral hemispheres in patients with cerebrovascular diseases revealed decreased blood flow, not only on the abnormal side, but also on the normal side. This was explained on the phenomenon of diaschisis. Correlation between images obtained by Xe-133 and I-123 iodoamphetamine was obtained. There was good correlation between the two techniques.

This study revealed that cerebral blood flow measurement by a ring-type ECT is a valuable method for evaluation of patients with cerebrovascular accidents.

84

ANALYSIS OF REPRODUCIBILITY OF Xe-133 INTRAVENOUS INJECTION METHOD WITH THE GAMMA CAMERA M.Nakamura,H.Etani,Y.Isaka,Y.Tsuda,E.Omori, F.Nakamura,Y.Kusumi,K.Kimura and H.Abe. Osaka medical School, Osaka.

The Xe-133 intravenous injection method for measuring rCBF has many advantages compared to the Xe-133 inhalation method. The start fit time (SFT), however, was diverse to be used in the previous published papers. The purpose of this study is to clarify the effects of SFT upon the reproducibility of this method and to select the most available starting point for the fit of the head curve. In each of 13 patients with CVD, two rest CBF measurements were made by Xe-133 intravenous slow, regular injection, with an interval of 30 minutes between the serial runs in each patients. The data analysis comprised the two-compartmentally derived parameters for f_1 , w_1 , K_2 and FF_1 , and in addition the ISI. In the calculation, the SFT was used to be at the point when the head curve had decayed to 90% of its maximum (H90%), at 15, 30, 60 seconds after the peak of the head curve, and 3 minutes after the beginning of the injection. At five different SFTs, the mean value of each hemispheric parameter of the 2nd measurement was not significantly different from that of the 1st measurement. The variation coefficient of the change from first to second measurement was on average 10% at H90%, 13.14% at others in the ISI. From this result, the SFT at H90% was indicated to be most available for the Xe-133 intravenous injection method.

85

XE-133 STUDY FOR REGIONAL CEREBRAL BLOOD FLOW IN CHILDREN. K.Morozumi, M.Hashimoto, K.Ikei, H.Hashimoto and H.Nishimoto*. Department of Radiological Technology and Neurosurgery*, Saitama Childrens Medical Center, Saitama.

Regional cerebral blood flow was studied with intravenous injection of Xe-133 in children with various cerebral disorders including hydrocephalus, subdural CSF collection, arterio-venous malformation and Moyamoya disease with ages ranging between 20 days and 16 years. In our laboratory study with utilizing Xe-133 point source and Mix-R (polyisopren 80.6%, carbon black 13.7% etc), Cross-talk (look through) ranged 10% to 20% on the opposite side. The positioning of the patients was safer and easier by using parallel type holder than by using helmet type holder. Because both hemispheric mean value and coefficient of variation were minimum in Fourier ISI, we have chosen Fourier ISI in the evaluation of our measurements. Based upon our experience, we felt that this method should be limited in children older than 5 years of age.

86

REGIONAL CEREBRAL BLOOD FLOW ANALYSIS OF VASCULAR DEMENTIA Xe-133 INHALATION METHOD. S.Watanabe, K.Miyakawa, G.Kamijima, Y.Sasaki, H.Takahashi, S.Yamaguchi, Y.Maruyama. Toho University School of Medicine. Tokyo.

We reported at last year's conference that cerebral blood flow (CBF) analysis of vascular dementia tended to show lower values, especially for white matter, with 2-compartmental analysis by the Xe-133 intraarterial injection method using scinticamera.

This year we report our results from the same series using the Xe-133 inhalation method.

After inhalation of 15mCi Xe-133 gas for one minute using a closed circuit, data were gathered for 10 minutes using an open circuit Aloka RRG-526 regional CBF measurement system. Regional CBF was calculated by 2-compartmental analysis and initial slope index method.

Eighty-one cases of ischemic cerebrovascular disease were investigated. Fifty-six were male and twenty-five were female. Ages ranged from 25 to 84, with a mean age of 65.4 years. Thirty-two had cerebrovascular dementia and forty-nine had other cerebral infarctions.

Cases of cerebrovascular dementia tended to have a lower mean CBF value. Regional CBF patterns showed lower values in the central area for cases of laterality as determined by CT scan. A comparison of mean CBF with Hasegawa's dementia scale revealed a statistically significant correlation.