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DISTRIBUTION AND CLEARANCE OF Kr-81m IN BRAIN WITH CONTINUOUS INTRACAROTID INFUSION: EVALUATION IN ANIMAL MODELS AND ESTIMATION OF INTERNAL RADIATION DOSE IN HUMANS. N.Ueda, M.Kato-Azuma and M.Hazue. Technical Dept. NIHON MEDI-PHYSICS CO., LTD. Takarazuka, Hyogo.

The objectives of our present study are 1) to confirm Fazio's assumption (JNM 18 962-966, 1977) using experimental models in rats and rabbits, and 2) to calculate the human exposure dosimetry using our experimental data. During the continuous intracarotid infusion of Kr-81m with 5% glucose (0.1ml/sec 20 sec), the activity in the brain of rats increased rapidly and maintained a constant level. After stopping infusion, the activity in brain decreased with an exponential curve, and its effective half-life was calculated as 12.97 ± 0.26 sec, which was identical to the physical half-life of Kr-81m. In rabbits, the activity in the ear decreased with an initial half-life of 7.2 ± 0.3 sec after stopping infusion, and this observation indicated the existence of active biological excretion. The activity in the ROI of the brain, however, decreased with a 13.1 ± 0.3 sec effective half-life after stopping infusion which was identical to the physical half-life of Kr-81m. These results provided experimental support to Fazio's assumption. We calculated the internal exposure radiation dose in humans with the assumption that the metabolism in animals is identical to that in humans.

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THREE DIMENSIONAL r-CBF BY THE METHOD OF RCT. T. Maeda, K. Hisada, M. Hayashi and H. Fujii. Kanazawa University. Kanazawa.

The r-CBF on the transverse section image by the Tomogscanner II was evaluated. Kr-81m was continuously milked from the 10 mCi of Rb-81 cow within the 5% glucose solution and injected into the internal carotid artery in 7.5 ml/min. The resolution of the Tomogscanner II was about 2 cm within 20 cm diameter slice at the energy of $190 \text{ KeV} \pm 10\%$. The high quality image was obtained in 4 min/slice. The normal pattern distinguished the insular and the cortical activity from the activity of white matter. The AVM showed very increased perfusion, and the infarction, the hematoma, the brain cyst, the cerebral contusion and the tumor showed decreased perfusion at the lesion. The change of the r-CBF was estimated after injection of prostaglandin E1.

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EVALUATION OF STA-MCA ANASTOMOSIS WITH CONTINUOUS CAROTID INFUSION OF Kr-81m. Y.Tsuda, H.Etani, K.Kimura, T.Nukada, Y.Iwata, H.Mogami. Division of Nuclear Medicine, First Department of Internal Medicine, Division of Neurosurgery in Osaka University Hospital.

A bypass procedure between STA and MCA has been progressed widely for the treatment of the carotid occlusive diseases. We evaluated 3 patients including 2 cases with ICA stenosis and 1 case with MCA occlusion who had got STA-MCA anastomosis. The rCBF study with Kr-81m continuous intracarotid infusion was performed almost at the same time with postoperative angiography. Kr-81m brain images were obtained at the lateral view of the bypassed hemisphere and the vertex view at the times of rest and STA compression. The changes of perfused area were got as the subtracted image between at rest and at STA compression by the subtraction technique processed with on-lined minicomputer system (Hitac 10,16kw 16bit). At the evaluation of the postoperative state, 1 case showed patent anastomosis and good filling of MCA in postoperative angiography which correlated with large perfused area of the subtracted image in the Kr-81m study, while other 2 cases showed poor opacification of MCA in postoperative angiography which correlated with very small perfused area of Kr-81m subtracted image. In conclusion, the subtracted image processed with on-lined minicomputer system showed good correlation with angiographic findings and with the functional patency of the anastomosed artery at the postoperative state.

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DIAGNOSIS OF CEREBRAL SINUS OBSTRUCTION BY TC-99M-LABELLED RED BLOOD CELLS. T.Fukumoto, K.Okada, H.Hiratsuka, Y.Inaba, H.Suzuki and T.Okuyama. Departments of Neurosurgery and Radiology, School of Medicine, Tokyo Medical and Dental University, Tokyo.

Diagnosis of cerebral sinus thrombosis or obstruction such as by tumor infiltration is often difficult by Tc-99m pertechnetate brain scanning even with the combination of radionuclide angiography. Four patients were studied using Tc-99m-labelled red blood cells. All cases had huge parasagittal or posterior fossa meningioma with possible sinus obstruction by tumor infiltration. The vascular image with Tc-99m-labelled red blood cells demonstrated clearly the site of sinus obstruction together with collateral vessels. The information was very useful for the surgical removal of the tumors.

We discussed the usefulness of this method in the diagnosis of sinus obstruction with other vascular lesions such as arteriovenous malformation, cerebral aneurysm and vascular tumors.