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Blood-BRAIN-BARRIER OF A BRAIN TUMOR MODEL
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. We investigated the permeability of a blood-brain-barrier in the experimental rat brain tumor model. Rat glioma RG-12 was injected sterotactically into basal ganglia, and after 14 days, a round solid tumor was formed, to which C-14-alpha aminoisobutylic acid and I-131 human serum albumin was injected intravenously, and extravasation of these materials from tumor was measured with planimetry. AIB was trapped in viable cells when it was leaked from vasularture, and therefore AIB was used as a reference standard. It was found that ratio HSA/AIB was 1.0 when both was given simultaneously. when HSA was administered 60 min previously, ratio increased to 1.64, and when HSA was administered 6 hrs previously, the ratio increased to 3.58. It was concluded that peripheral edema of ths experimental rat brain tumor comes from the leak of HSA from disrupted blood-brain-barrier. (p 0.001, 0.004 and 0.001 respectively). The authors suggest that the same mechanism will apply to the human malignant brain tumor, with the supporting electro microscopic evidence that tight junction is lacking in tumor, but it is intact in the region around the tumor.

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INVESTIGATION OF COMPARISON BETWEEN THREE PARAMETERS (PEAK COUNT ,PEAK TIME, POOL TRANSIT TIME(PTT)) OBTAINED FROM RI ANGIOGRAPHY AND r-CBF.
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Three Parameters(peak count, peak time, PTT) on region of interest in each hemisphere obtained with RI angiography after a bolus injection of 20mCi Tc--99m-DTPA were compared with r-CBF by 133-Xe inhalation using SPECT in 5 normals and 44 patients with cerebral infarctions. Peak count was expressed as the count ratio of affected/unaffected hemisphere. Peak time was the interval between maximal bolus passage of aortic arch and peak count of left or right hemisphere. PTT was the interval between maximal positive deflection and maximal negative deflection of the first delivative of bolus curve. There was decrease of peak count, and prolongation of peak time and PTT in affected side in old infarction. Increase of peak count, and shotening of peak time and PTT in affected side where "so-called" luxury perfusion demonstrated by r-CBF study were noted. There was not so good corelation between three parameters and r-CBF results.

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THE REGIONAL DISTRIBUTIONS OF N-ISOPROPYL-P-(I-123)IODOAMPHETAMINE IN BRAIN TUMORS.
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The regional distributions of N-isopropyl-p-(I-123)iodoamphetamine (IMP) were studied in 10 cases with brain tumor (three of meningioma, each one of astrocytoma, craniopharyngioma, oligodendroglioma, medulloblastoma, acoustic neurinoma, hemangioblastoma and metastasis from lung cancer), using multislice SPECT scanner(SHIMADZU SET 030W). Dynamic scans (8 frames every two minutes) showed high radioactivity in all 3 meningiomas and one astrocytoma, suggesting high blood flow in the lesions. However, early static scans (within one hour) revealed high radioactivity of the lesions only in one meningioma and one astrocytoma. In contrast, delayed static scans (5 to 6 hours) showed lower activity of the lesions than that of surrounding cerebral cortices in all cases, indicating the presence of washout mechanism of IMP. The regional blood flow was measured by PET in each one case of meningioma and medulloblastoma. The former showd high blood flow, the latter low flow, which were well corresponding to the uptake of IMP in dynamic and early static scans. SPECT with IMP in brain tumors is potential to evaluate the regional blood flow, although it is essential to consider the mechanism of uptake and washout of tracer.

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CORRELATIVE STUDIES OF THE BRAIN WITH I-123 IMP-SPECT, MRI AND XCT.
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Twelve patients with a variety of CNS disorders were examined with I-123 IMP-SPECT, MRI and XCT. SPECT images were obtained using GE400AC/T and MRI was performed with 0.35 or 1.5 Tesla superconductive magnet. SPECT was most sensitive for the detection of lesions in all five cases with cerebral infarction. Crossed cerebellar diaschisis was only detected by SPECT in cerebral infarction(2/5), multiple sclerosis(1/1) and Alzheimer's disease (1/5). In 5 cases with Alzheimer's disease (AD), MRI and XCT showed cerebral atrophy (5/5) and periventricular change (3/5), whereas SPECT revealed decreased activity of bilateral parietotemporal cortex(3/5) and/or severe R-L cerebral asymmetry(2/5). The findings suggest that SPECT can detect earlier change of Alzheimer's brain than MRI or XCT. In one case of Creutzfeldt-Jakob disease, SPECT showed diffuse decrease of activity in cerebral cortex, although MRI and XCT suggested minimal atrophy of cortex. In conclusion, SPECT appears valuable for the detection of the disturbed perfusion area and remote effect in cerebral infarction and the early focal change in dementia. SPECT can be useful in differential diagnosis of dementia.