

isotope uptake during radionuclide scanning may result from similar pathophysiologic mechanisms following ischemic stroke was investigated in an animal model. Infarction was produced by trans-orbital occlusion of the middle cerebral artery in 13 cats killed 1, 2, 4, 8, or 16 days later. Sodium pertechnetate containing technetium-99m (2 mCi) and 30% iohalamate methylglucamine containing iohalamic acid labeled with I-125 (20 to 60 μ Ci) were administered intravenously 60 and 15 min, respectively, prior to sacrifice. A coronal slice through the infarcted area was divided into 30 portions, assayed by scintillation counter for technetium-99m and I-125 contents. Adjacent brain anterior and posterior to the removed slice was prepared for pathologic correlation.

Strong positive correlation of technetium and iodine concentrations was found in infarcted, ischemic, and non-ischemic brain at all time intervals. Concentrations were highest in infarcted brain at 4 and 8 days, correlating with histologic necrosis, macrophage infiltration, and early vascular hyperplasia.

Results support the concept that disposition of pertechnetate and iodine-containing contrast media is similar in stroke.

II-9

Middle Cerebral Artery Dissection in Childhood — Bernard P, Dooling E (Department of Neurology, Massachusetts General Hospital, Boston)

Nontraumatic, intracranial dissections have rarely been reported in otherwise healthy children, so documentation of such cases is helpful to promote recognition of the disorder. Three white children, aged 5, 13, and 15 years, presented with acute strokes characterized by a relapsing and remitting course over a few hours and were found to have middle cerebral artery (MCA) dissection. Headache, gait difficulty, and speech disturbance occurred abruptly during normal play and were followed by hemiplegia with aphasia or anosognosia. Systemic or cardiac disease and hematologic disorders were excluded. Noninvasive studies were unremarkable. Angiography disclosed the string sign in the MCA, indicating vascular dissection which was confirmed at autopsy in one case. The surviving children showed better recovery of speech and language than sensorimotor function on follow up. Angiography remains the definitive procedure in childhood stroke. In cases of dissection affecting children (3 above, 7 from literature), the MCA appears to be the most vulnerable intracranial vessel.

SESSION III: CEREBRAL BLOOD FLOW

Friday (10:30 a.m.—12:00 p.m.)

III-1

Effect of Vasospasm on Cerebral Blood Flow (CBF) Following Subarachnoid Hemorrhage (SAH) — Pitts

LH, Macpherson P, Wyper DJ, Jennett WB, Blair I, Cook M (Department of Neurosurgery, University of California at San Francisco)

The detrimental effect of angiographic cerebral vasospasm following SAH has been disputed. In general, vasospasm lowers CBF but its effect on clinical status and outcome has been variable. To further define the importance of vasospasm, we studied 111 patients, relating CBF to degrees of vasospasm and clinical status. The following observations were statistically valid.

CBF was lower in poor clinical grades than in higher grades. The presence of any spasm diminished CBF, and more marked degrees of vasospasm caused substantial CBF decreases. We confirmed that poor clinical grade correlated with a poor outcome in the entire population and in the subgroup of patients who underwent surgery for aneurysm clipping. Moderate or severe spasm correlated with a low clinical grade and with focal motor deficits.

These data support the view that vasospasm is clinically harmful, and at times fatal, and that continued research is required for improved therapy.

III-2

Intravenous Nitroglycerin in Cerebral Vasospasm — Kistler JP, Lees RS, Candia G, Zervas NT, Crowell RM, Ojemann RG (Massachusetts General Hospital and Massachusetts Institute of Technology, Boston and Cambridge)

Cerebral arteriospasm is a common complication of subarachnoid hemorrhage and is responsible for much of the brain damage which accompanies it. No pharmacologic agent has been found which regularly alleviates cerebral arteriospasm. Intravenous nitroglycerin is becoming widely used as a coronary vasodilator in patients with ischemic heart disease.

We have evaluated the effect of continuous intravenous nitroglycerin infusion on the diameter of the basilar artery in dogs with experimental cerebral vasospasm. Six consecutive dogs were studied 48 hours after the injection of 3 cc of autologous blood into the subarachnoid space. In all 6 animals the diameter of the basilar artery increased from $75 \pm 2\%$ to $114 \pm 2\%$ of its control value ($p < 0.001$) 10 minutes after beginning intravenous nitroglycerin at 100 μ g/min and remained at that diameter for the entire 120 minutes of infusion. At the doses used (4–8 μ g/kg/min), nitroglycerin caused only a modest decrease (8%) in blood pressure.

Nitroglycerin may be an effective agent in the treatment of cerebral arteriospasm secondary to subarachnoid hemorrhage.

III-3

Regional Cerebral Blood Flow in Extracranial Vascular Disease — Levin AB, Alexander SC, Polcyn R (Division of Neurological Surgery, University of Wisconsin, Madison)

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