

OPIOID EFFECTS IN ACUTE EXPERIMENTAL CEREBRAL ISCHEMIA: NUCLEAR MAGNETIC RESONANCE (NMR) IMAGING AND 2-DEOXYGLUCOSE (2-DG) AUTORADIOGRAPHIC STUDIES - Levy, RM, Stryker, MP and Hosobuchi, Y (Department of Neurological Surgery, University of California, San Francisco, California) 41

Using unilateral carotid artery ligation in the gerbil as a model of acute experimental cerebral ischemia, NMR imaging and a new double label autoradiographic technique have been employed to evaluate the effect of opiate agonists and antagonists on cerebral edema and glucose metabolism.

One hundred thirty-two gerbils were imaged from 3 to 24 hours after ligation of the right carotid artery and again after pharmacologic treatment. While the ischemic lesion is clearly demonstrated on NMR imaging, neither 10 mg/kg morphine sulfate nor 2 mg/kg naloxone affected the abnormalities visualized on initial imaging. A second group of animals was injected with  $^{14}\text{C}$ -2-DG before and  $^3\text{H}$ -2-DG after the administration of 2 mg/kg naloxone. Using autoradiographic and computer analyzed imaging techniques, the effect of naloxone in symptomatic animals was evaluated. The most profound effect was a marked focal increase in the glucose metabolism of several subcortical centers, including the substantia nigra, periaqueductal grey and the red nucleus. Thus, while the effects of opiate antagonists in cerebral ischemia do not appear to be secondary to alterations in postischemic edema, they may be related to activation of subcortical nuclei distant to the ischemic cortex itself.