

TRANSIENT CEREBRAL ISCHEMIA CAUSES A PROGRESSIVE DECLINE IN BRAIN FUNCTION

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Recent studies have identified common elements in brain pathology produced by transient hypoperfusion of the brain and progressive age-associated neurodegenerative diseases (Brain Research, 1022, 2004). The goal of this study was to determine whether or not a progressive decline in cognitive or psychomotor function was associated with brain damage produced by transient middle cerebral artery occlusion (tMCAO). Female Sprague-Dawley rats were obtained from Charles River and maintained on an ad libitum diet. They were ovariectomized at 3 months of age and received ischemia at 4 months of age. The rats were divided in the following groups: 30-days post stroke, 7-days post stroke, sham and control. At the appropriate times following stroke, the rats were subjected to a battery of behavioral tests for cognitive and psychomotor performance. These tests included locomotor activity, coordinated running performance, swim maze and startle response. The tMCAO resulted in a poorer learning of the swim maze task as compared to their age-matched shams and controls. However, the 30- day post stroke rats tended to perform worse than the 7-day post stroke in learning to locate the platform in swim maze task. In spontaneous locomotor activity there was an increase in activity following stroke and the 30-day post stroke group showed higher activity as compared to the 7-day post stroke group. In acoustic startle response all rats habituated to the 120-dB sound after the first few trials. Interestingly, both stroke groups habituated more slowly than did controls, with the 30-day post stroke group tending to sustain a high level of response for longer than the 7-day post stroke group. In the test for coordinated motor ability there was no difference in performance in both stroke and control groups. The results indicate that, over a period of 30 days following tMCAO, there is a progressive decline in brain function involving cognitive but not psychomotor performance.