PA-2

Neuroprotective Effect of Aloesin in a Rat Model of Focal Cerebral Ischemia

K.J. Jung*, M.J. Lee, E.Y. Cho, Y.S. Song, Y.H. Lee, Y.L. Park, Y.S. Lee and C. Jin

Life Science Division, Korea Institute of Science & Technology, Seoul 130-650, Korea.

It is now convincing that free radical generation is involved in the pathophysiological mechanisms of ischemic stroke, particularly in ischemia-reperfusion injury. The present study, therefore, examined neuroprotective effect of aloesin isolated from Aloe vera, which was known to have antioxidative activity, in a rat model of transient focal cerebral ischemia. Transient focal cerebral ischemia was induced by occlusion of middle cerebral artery for 2 hr with a silicone-coated 4-0 nylon monofilament in male Sprague-Dawley rats under isoflurane anesthesia. Aloesin (1, 3, 10, 30 and 50 mg/kg/injection) was administered intravenously 3 times at 0.5, 2 and 4 hr after onset of ischemia. Neurological score was measured 24 hr after onset of ischemia immediately before sacrifice. Seven serial coronal slices of the brain were stained with 2,3,5-triphenyltetrazolium chloride and infarct size was measured using a computerized image analyzer. Treatment with the dose of 1 or 50 mg/kg did not significantly reduce infarct volume compared with the saline vehicle-treated control group. However, treatments with the doses of 3 and 10 mg/kg significantly reduced both infarct volume and edema by approximately 47% compared with the control group, producing remarkable behavioral recovery effect. Treatment with the dose of 30 mg/kg also significantly reduced infarct volume to a lesser extent by approximately 33% compared with the control group, but produced similar degree of behavioral recovery effect. In addition, general pharmacological studies showed that aloesin was a quite safe compound. The results suggest that aloesin can serve as a lead chemical for the development of neuroprotective agents by providing neuroprotection against focal ischemic neuronal injury.