ABSTRACT

Aim: The purpose of this study was to investigate cerebroprotective action of Naringenin (NAR) against cerebral ischemia-reperfusion induced cerebral infarction in both normal and streptozotocin-induced diabetic rats.

Methods: In the present study, Male Wistar albino rats weighing 200-250 gm were procured from authorized suppliers. They were anesthetized by giving thiopentone sodium (45 mg/kg) by i.p. surgical technique for the induction of cerebral ischemia was adopted from the earlier published method. Acute ischemia-reperfusion (I/R) was produced by blocking bilateral common carotid arteries (BCCA) for 30 min and reperfusion for 48 h was allowed. The drug naringenin (15 mg/kg; i.p) and naringenin (30 mg/kg; i.p.) was administered 10 min before reperfusion and nitric oxide inhibitor, L-NAME (10 mg/kg; i.p.), xanthine oxidase inhibitor, allopurinol (10 mg/kg; i.p.) and selective COX-2 inhibitor, nimesulide (20 mg/kg; i.p.) were administered 10 min before ischemia. After 48 h reperfusion, animals were sacrificed and immediately brain was removed and allowed to homogenize and supernatant was collected and the biochemical marker estimations were done for both normal and STZ (45 mg/kg; i.p.) induced diabetic rats. We determined the volume of the cerebral infarction to reflect the degree of brain injury.

Results: The injuring brain tissue has obvious infarction in I/R control group and showed significant increase in malondialdehyde (MDA) and myeloperoxidase (MPO) levels and depletion in superoxide (SOD) and catalase (CAT). Treatment with naringenin and nimesulide has significantly exacerbated SOD and CAT levels and decreased the MDA and MPO levels in both normal and STZ-induced diabetic rats.

Conclusion: These findings suggest the cerebral injury due to over production of oxygen radicals was inhibited by naringenin and nimesulide by limiting multiple pathways which exert a neuroprotective effect probably by radical scavenging and antioxidant properties.

Keywords: NAR; Cerebral ischemia-reperfusion injury; Free radical; Free radicals scavenger; L-NAME; APR; NIM and Neuro-protective effect.