EFFECT OF *NIGELLA SATIVA* AND ITS ACTIVE CONSTITUENT, THYMOQUINONE, ON LEARNING AND MEMORY IMPAIRMENTS FOLLOWING LONG-TERM CEREBRAL HYPOPERFUSION IN RATS

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*Nigella sativa*, a plant widely used in traditional medicine, has been shown to possess anti-inflammatory, antioxidant and neuroprotective properties. In the present study, we investigated the effect of hydroalcoholic extract of *N. sativa* seeds (NSE) and thymoquinone (TQ), its active constituent, on learning and memory deficits following long-term cerebral hypoperfusion in rats. Long-term cerebral hypoperfusion (a model of cerebrovascular insufficiency and dementia) was induced by permanent occlusion of bilateral common carotid arteries (BCCA) for 7 days. Male Wistar rats (8-10 per group) were received either vehicle (10 ml/kg/day, ip) NSE (100, 200 and 400 mg/kg/day, ip), TQ (10, 20 and 40 mg/kg/day, ip) or donepezil (3 mg/kg/day, ip) for 10 days (3 days before ligation and 7 days after ligation). In comparison with sham-operated animals, BCCA produced significant memory deficits as evidenced by increased escape latency (p< 0.01), increased swimming time (p< 0.01) and decreased time spent in target quadrant (p< 0.01) in probe trial in Morris water maze (MWM) test. There was also a significant increase (p< 0.001) in thiobarbituric acid reactive species (TBARS) level in the hippocampal portion of hypoperfused rats, as compared with sham group. Treatment with NSE (400 mg/kg/day, p< 0.001) and TQ (40 mg/kg/day, p< 0.01), as well as donepezil, significantly prevented hypoperfusion-induced memory deficits. NSE and TQ also significantly alleviated changes in hippocampal TBARS levels following long-term cerebral hypoperfusion.

In conclusion, our data suggest the beneficial role of *N. sativa* and thymoquinone, its active constituent, in cerebrovascular insufficiency states and dementia.