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Effect of Nigella sativa on Chronic Cerebral Hypoperfusion-induced Memory and Learning Impairment.

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Abstract: Memory and learning impairment in elderly is becoming an increasing challenge especially in those with vascular risk factors. The fixed oil of Nigella Sativa NSO (black cumin) has revealed considerable antioxidant, anti-inflammatory and immune-modulatory effects which may prevent or arrest the deteriorating learning and memory brain function. Two vessel occlusion (2VO) in rats has been broadly used as a model for chronic cerebral hypoperfusion. The present experimental study was planned to use Morris water maze (MWM) test to compare the cognitive performance of rats with memory and learning deficits induced by 2VO surgery with that of a healthy Sham control animal group and orally treated with the NSO. 60 Sprague Dawley (SD) rats were equally divided into 2 main groups for long term memory (LTM) protocol and short term memory (STM) with (working memory) protocol of MWM. Each group was subdivided into 3 subgroups (n=10) – Group A, untreated 2VO; Group B, sham control and Group C, orally NSO treated 2VO. For LTM and STM Morris water maze test, both Sham control and NSO treated groups showed significantly lower escape latency time ($p<0.01$), total distance travelled ($p<0.01$), longer time spent in the target zone and a higher number of annulus crossings as compared to untreated 2VO group. Working Memory MWM test for both Sham control and NSO treated groups showed significantly lower escape latency time ($p<0.01$) and total distance travelled ($p<0.01$) as compared to untreated 2VO. The study suggests that the seeds of Nigella sativa may have potential memory and learning enhancing activity and may open the way for prophylactic use to patients with early signs of memory and/or learning deficits or even those who are at high risk for developing neurodegenerative diseases like Alzheimer's disease.