Behavioral based evaluation of the effects of chronic Nigella sativa oil administration on spatial memory performance

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Abstract

*Nigella sativa*, commonly known as Black seed, is an herbaceous annual flowering plant known to have antioxidant and neuroprotective effects. Behavioral based research using eight-arm radial arm maze (RAM) is a possible approach to study its effects on cognitive function, e.g., spatial memory. Our previous study showed that *Nigella sativa* oil (NSO) treatment did not hinder the establishment of reference and working memory components of the spatial memory in 4-baited arms RAM test. It demonstrated that lesser mean numbers of error were observed for the NSO group in both parameters as compared to the control group. In this follow up study, the effects of NSO administration on the spatial memory performance (SMP) was further investigated using 8-baited arms RAM test. Male adult Sprague Dawley rats (7-9 weeks old; n=12) were force-fed daily with 6.0μl/100g body weight of NSO (n=6) or 0.1ml/100g body weight of corn oil (CO, vehicle control) (n=6) for 20 consecutive weeks. Six specific rats from each NSO and CO groups were used, respectively. During the weekly evaluation of SMP, one day food-deprived rats were tested by allowing each of them 10 minutes to explore the RAM for food as their rewards. Results revealed that there was a reduction of working memory error (WME) throughout the study and lesser mean numbers of WME were observed for NSO group as compared to the CO group. NSO group also exhibited improved correct arm choices in first eight visits (choice accuracy), indicating spatial learning and memorization had taken place. From these results, it is concluded that NSO could enhance SMP of the rats, demonstrated by improved working memory performance and choice accuracy.

Keywords: *Nigella sativa*, radial arm maze, reference memory, spatial memory, working memory

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