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Effect of Nigella sativa on Blood Pressure, Vascular Reactivity, Inflammatory Biomarkers and Nitric Oxide in L-Name-Induced Hypertensive Rats

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Abstract : Forty (40) normotensive adult male Sprague-Dawley rats aged three months weighing 180-200 g were divided into 4 groups with 10 rats per group: (1) normotensive control; (2) hypertensive rats; (3) hypertensive rats treated with Nigella sativa (2.5 ml/kg/day); and (4) hypertensive rats treated with nicardipine (5 mg/kg/day). After acclimatization, the hypertensive rats of the group 2, 3 and 4 were induced to be hypertensive by giving NW–nitro-L-arginine methyl ester (L-NAME; 30 mg/kg/day) in their drinking water for consecutive 7 days. After one week, rats in the group 3 were given a daily oral dose of 2.5 ml/kg/day of Nigella sativa (NS) by oral gavage. Rats in the group 4 were given nicardipine (5 mg/kg/day) via oral gavages. All rats in this study received L-NAME continuously throughout the treatment duration. The blood pressure will be measured pre-treatment and weekly for 8 weeks using power lab. Blood was taken before and at the end of study for measurement of nitric oxide. At the end of 8 weeks, the rats are sacrificed and descending thoracic aorta was disserted for measurement of vascular reactivity, and intracellular adhesion molecules (ICAM-1) and vascular cell adhesion molecules (VCAM-1). Nigella sativa reduced both systolic and diastolic BP compared to control and L-name group. The BP lowering effect of NS was comparable to nicardipine a calcium antagonist. The blood pressure lowering effect of NS was accompanied with an increasing relaxation response to nitroprusside and acetylcholine and reducing vasoconstriction response to epinephrine. L-NAME and nicardipine on the other hand, reduced plasma nitric oxide concentration. In contrast, NS increased NO concentration. However, Nigella sativa had no significant effect on aortic VCAM- 1 and ICAM-1 expression. In conclusion; Nigella sativa oil reduces both systolic and diastolic blood pressure in L-NAME treated rats. The antihypertensive effect of NS was comparable to nicardipine. The BP lowering effect may be mediated via stimulating nitric oxide release from vascular endothelium.

Keywords : Nigella sativa, ICAM, VCAM, blood pressure, vascular reactivity
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