

Nigella sativa L. seed regulated eNOS, VCAM-1 and LOX-1 gene expression and improved vasoreactivity in aorta of diabetic rat

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Abstract

Ethnopharmacological relevance: *Nigella sativa* L. seed has been widely used in traditional medicine for the treatment of diabetes. The major reason for vascular complications in diabetic patients is endothelial dysfunction. However, the impact of *N. sativa* seed on endothelial dysfunction in diabetes remains unclear.

Aim of the study: This study was conducted to evaluate the effect of the hydroalcoholic extract of *N. sativa* seed on eNOS, VCAM-1, and LOX-1 genes expression and the vasoreactivity of aortic rings to acetylcholine (Ach) in streptozotocin (STZ)-induced diabetic rat.

Materials and methods: Treated rats received *N. sativa* seed extract (100, 200, and 400 mg/kg) daily by gavage for 6 weeks. The fasting blood glucose and lipids were measured and atherogenic index of plasma (AIP) was calculated. The endothelium-dependent vasoreactivity responses of isolated aortic rings were evaluated in the presence of cumulative concentrations of Ach (10(-8)-10(-5) M). eNOS, VCAM-1, and LOX-1 genes expression in aortic tissue was assessed by using real time polymerase chain reaction (PCR).

Results: Male diabetic Wistar rats treated with *N. sativa* seed extract for six weeks reduced serum glucose and lipids and improved AIP. The vasorelaxant responses of aortic rings to Ach were markedly improved. *N. sativa* seed significantly increased eNOS in mRNA expression level and function, while it decreased VCAM-1 and LOX-1 expressions in vascular cells of aortic tissue which assessed only in mRNA level.

Conclusions: The results of this study showed that *N. sativa* seed more likely, has antidiabetic and anti-hyperlipidemic properties and improved vasoreactivity, endothelial dysfunction, and vascular inflammation in diabetic rats' aorta.

Keywords

KeyWords Plus: ENDOTHELIAL DYSFUNCTION; OXIDATIVE STRESS; INSULIN-RESISTANCE; INHIBITION; MECHANISMS; EXTRACT