

# The effect of *Nigella sativa* oil on vascular dysfunction assessed by flow-mediated dilation and vascular-related biomarkers in subject with cardiovascular disease risk factors: a randomized controlled trial

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## Abstract

Cardiovascular diseases (CVD) are the leading causes of mortality worldwide. Flow-mediated dilation (FMD) is a marker of vascular function. Beneficial cardiometabolic effects of *Nigella sativa* (*N. sativa*) have been observed. We evaluated the effect of *N. sativa* oil on FMD, plasma nitrite, and nitrate (NO<sub>x</sub>) as nitric oxide (NO) metabolites, and inflammatory markers in subjects with CVD risk factors. Fifty participants were randomly assigned to either the *N. sativa* (two capsules of 500 mg *N. sativa* oil) or the placebo group (two capsules of 500 mg mineral oil), for two months. The brachial FMD, plasma NO<sub>x</sub>, vascular cellular adhesion molecule-1 (VCAM-1), and intracellular adhesion molecule-1 (ICAM-1) were measured. FMD and plasma NO<sub>x</sub> levels were significantly increased in the *N. sativa* group compared to the placebo group (changes:  $2.97 \pm 2.11\%$  vs  $0.71 \pm 3.19\%$ ,  $p < 0.001$  for FMD and  $4.73 \pm 7.25 \mu\text{mol/L}$  vs  $0.99 \pm 5.37 \mu\text{mol/L}$ ,  $p = 0.036$  for plasma NO<sub>x</sub>). However, there was no significant difference in ICAM-1 and VCAM-1 levels between groups. Therefore, *N. sativa* oil improves vascular NO and FMD in subjects with cardiovascular risk factors. However, more studies are warranted to confirm the beneficial impacts of the *N. sativa* oil on vascular inflammation.

**Keywords:** *Nigella sativa*; vascular function; FMD; inflammation; CVD

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