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Acute consumption of phenolic-rich olive leaf extract reduces arterial stiffness and decreases interleukin-8 production

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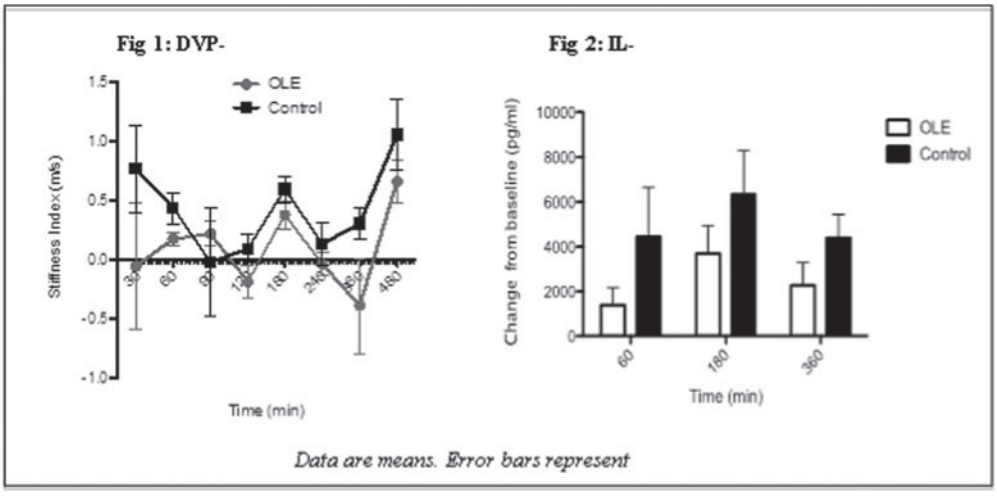
There is an association between the high consumption of olive oil, the principle fat in the Mediterranean diet, and a reduction in chronic disease risk[1]. Data has highlighted the health-promoting effects of phenolic compounds present within the water-soluble fraction of the oil[2]. However, olive leaves are the richest source of phenolics within the olive plant (*Olea europaea*), with the secoiridoid, oleuropein, being the most abundant compound.

In a randomised, controlled crossover clinical trial, 18 subjects (9 male, 9 female) aged 19–40 years consumed either 4 phenolic-rich olive leaf extract (OLE) capsules, (each containing 400 mg olive leaf extract, equivalent to 2.4 g fresh olive leaf and 14.53 mg oleuropein, plus 672.5 mg safflower oil) or a control (900 mg safflower oil) in a random order, separated by a 4-week washout. Blood and urine were collected to ascertain the bioavailability of OLE (data not shown). Subjects consumed a low polyphenol diet for 24 hours prior to each study day. Digital volume pulse-derived stiffness index (DVP-SI) was obtained via PCA2 Pulse Trace at baseline and 30, 60, 90, 120, 180, 240, 360 and 480 minutes after capsule ingestion. A low fat, low polyphenol meal was provided after the 240 minute sample. For whole blood cytokine production, blood collected at baseline, 60, 180 and 360 minutes was diluted 1 : 1 with RPMI 1640 medium (containing 1% antibiotics), stimulated with LPS (1 μg/ml) and incubated for 24 hours (37 °C; 5% CO2). Supernatants were collected and stored at −80 °C until analysis for interleukin(IL)-1β, IL-6, tumour necrosis factor(TNF)-α, IL-8 and IL-10 using Fluorokine MAP ELISA kits and a Luminex reader. Prism (GraphPad software, USA) was used to analyse the data. Differences in DVP-SI, IL-1 β, IL-6, TNF-α, IL-8 and IL-10 by treatment were identified using a two-way ANOVA with repeated measures. Post hoc analysis was subjected to Bonferroni correction. P values less than 0.05 were treated as significant.



DVP-SI and IL-8 were significantly lower over the course of the study day ($P<0.01$ and $P<0.05$ respectively) when subjects consumed OLE capsules *vs.* the control. Post hoc analysis revealed no significant differences at any individual time point over the day. There was no significant treatment effect on IL-1 β, IL-6, TNF-α or IL-10.

The effect of OLE phenolics on vascular function, an important CVD risk marker, has not been studied previously. The current study demonstrated that OLE phenolics have anti-inflammatory properties during the postprandial period, and decrease arterial stiffness. Further work aims to characterize the mechanisms underlying these effects.

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3. Ruano J, Lopez-Miranda J, Fuentes F, *et al. J Am Coll Cardiol*. 2005; **46**(10): 1864–8.