

Effect of long-chain fatty alcohols from orujo olive oil on nitric oxide and eicosanoid generation

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Olive pomace oil ('orujo' oil) is an olive oil product suitable for human consumption that is traditionally produced in Spain⁽¹⁾. The non-acylglycerol component of this oil is a good source of interesting minor components, e.g. triterpenes⁽²⁾, or fatty alcohols, derived from waxy materials. Tetracosanol (C₂₄OH; 30%), hexacosanol (C₂₆OH; 37%) and octacosanol (C₂₈OH; 15%) are the major constituents of the long-chain fatty alcohol (LCFA) fraction isolated from orujo olive oil⁽³⁾. A similar mixture of long-chain alcohols, termed 'policosanol' and purified from waxy materials of different sources such as sugar cane, bees wax, rice bran or spinach, have shown many beneficial physiological activities^(4,5). The present study focused on the effect of LCFA isolated from orujo olive oil on NO, PGE₂ and TNF α release by a lipopolysaccharide (LPS)-stimulated murine macrophage cell line (RAW-264.7) as well as the effect on thromboxane B₂ (TXB₂) generation by A-23187-stimulated rat peritoneal neutrophils (PMN). Nitrite (as an index of NO generation) levels were determined by a fluorometric method. PGE₂, TNF α and TXB₂ production were quantified by sandwich immunoassay.

LCFA significantly and dose-dependently decreased the NO production in LPS-stimulated RAW-264.7 cell line macrophages (Fig. 1). Western-blot analysis for inducible NO synthase (iNOS) showed that NO reduction was a consequence of the 100% inhibition of iNOS expression at a dose of 100 μ g/ml (Fig. 2). By contrast, LCFA scarcely affected PGE₂ levels (Fig. 1). TNF α production was also significantly decreased by LCFA at the highest dose assayed (100 μ g/ml; Fig. 1). LCFA significantly reduced TXA₂ production in rat PMN stimulated with A-23187 (Fig. 3).

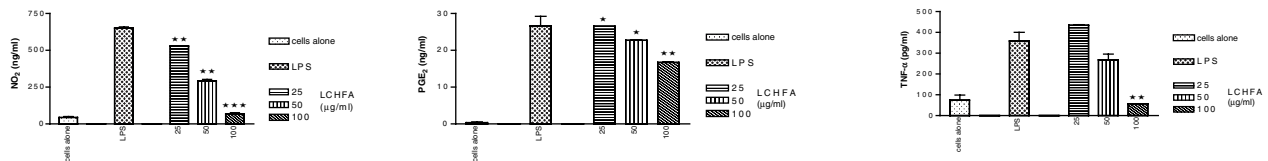


Fig. 1. Effect of LCFA on NO, PGE₂ and TNF α produced by LPS (10 μ g/ml)-stimulated RAW-264.7 murine macrophages (1 \times 10⁶ cells/ml). Mean values were significantly different from those for LPS control group: ***P* < 0.01, ****P* < 0.001.



Fig. 2. Effect of LCFA subfraction on iNOS expression and densitometric analysis in RAW 264.7 cells. DEX, dexamethasone; OD, optical density.

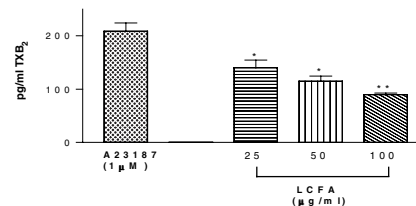


Fig. 3. Effect of LCFA on TXB₂ produced by A-23187-stimulated rat PMN. Mean values were significantly different from the control value: **P* < 0.05, ****P* < 0.001.

These results showed that LCFA isolated from 'orujo' oil has a protective effect on some mediators implicated in the development of inflammatory damage in these experimental models and suggest its potential value as a functional component of the olive pomace oil.

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