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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 (C 24OH; 30%), hexacosanol (C 26OH; 37%) and octacosanol (C 28OH; 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, PGE 2 and TNFα 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. PGE 2, TNFα 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 µg/ml (Fig. 2). By contrast, LCFA scarcely affected PGE 2 levels (Fig. 1). TNFα production was also significantly decreased by LCFA at the highest dose assayed (100 µg/ml; Fig. 1). LCFA significantly reduced TXA 2 production in rat PMN stimulated with A-23187 (Fig. 3).

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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