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The effects of dietary fish oil on chemokine secretion by murine peritoneal and spleen cells

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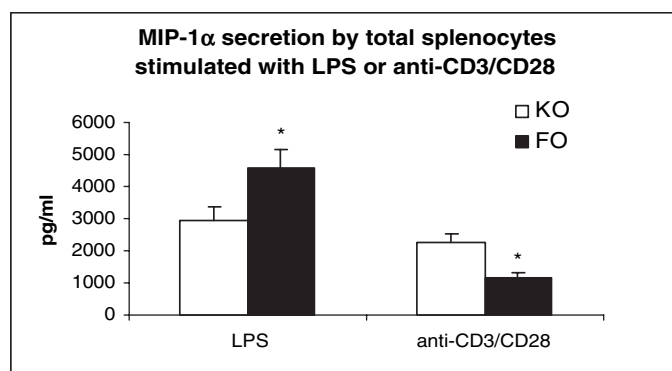
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Dietary fish oil, rich in *n*-3 PUFA, affects immune function partly by its effects on cytokine secretion by peritoneal and splenic macrophages and T-cells^(1,2,3). The effects of dietary fish oil on secretion of chemokines by these cells have been less studied. Macrophage inflammatory protein 1 α (MIP-1 α) and monocyte chemoattractant protein 1 (MCP-1) are chemokines that act on and are secreted by monocytes, macrophages and T-cells⁽⁴⁾. MIP-1 α may promote a T-helper (Th) 1-type immune response⁽⁵⁾, whereas MCP-1 is thought to promote a Th2-type immune response⁽⁶⁾. The aim of the present study was to determine the effects of dietary fish oil on MIP-1 α and MCP-1 secretion by murine peritoneal macrophages and splenic macrophages and T-cells *ex vivo*.

Mice were fed diets supplemented with (g/kg) 180 fish oil+20 maize oil or 200 maize oil for 6 weeks (*n* 10). Resident peritoneal macrophages were stimulated with lipopolysaccharide (LPS) with or without antibodies against TNF α or IL-10. Total spleen cells were stimulated with LPS or antibodies against CD3 and CD28. Concentration of the chemokines MIP-1 α and MCP-1 in the medium was measured by ELISA.

Dietary fish oil did not affect LPS-induced MIP-1 α secretion but decreased LPS-induced MCP-1 secretion by resident peritoneal macrophages (329 v. 174 pg/ml respectively, *P*=0.01). The effect of dietary fish oil on MCP-1 secretion was not mediated by an effect on TNF α or IL-10 production as it was not affected by antibodies against TNF α or IL-10. On the other hand, dietary fish oil increased LPS-induced MIP-1 α secretion by splenic macrophages (see Figure) but had little effect on MCP-1 secretion. Dietary fish oil decreased anti-CD3/anti-CD28-induced MIP-1 α secretion by splenic T-cells (see Figure) but had no effect on MCP-1 secretion.

These results demonstrate that dietary fish oil affects chemokine secretion by peritoneal and splenic macrophages as well as T-cells and that its effects depend on the cell type and location. These effects of dietary fish oil on chemokine secretion may help explain its effects on immune function in which chemokines play an important role.



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