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The effect of omega-3 FAs on tumour angiogenesis and their therapeutic potential.

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Abstract

Omega-3 fatty acid (omega-3 FA) consumption has long been associated with a lower incidence of colon, breast and prostate cancers in many human populations. Human trials have demonstrated omega-3 FA to have profound anti-inflammatory effects in those with cancer. In vitro and small animal studies have yielded a strong body of evidence establishing omega-3 FA as having anti-inflammatory, anti-apoptotic, anti-proliferative and anti-angiogenic effects. This review explores the evidence and the mechanisms by which omega-3 FA may act as angiogenesis inhibitors and identifies opportunities for original research trialling omega-3 FAs as anti-cancer agents in humans. The conclusions drawn from this review suggest that omega-3 FAs in particular eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) found principally in oily fish have potent anti-angiogenic effects inhibiting production of many important angiogenic mediators namely; Vascular Endothelial Growth Factor (VEGF), Platelet-Derived Growth Factor (PDGF), Platelet-Derived Endothelial Cell Growth Factor (PDECGF), cyclo-oxygenase 2 (COX-2), prostaglandin-E2 (PGE2), nitric oxide, Nuclear Factor Kappa Beta (NFKB), matrix metalloproteinases and beta-catenin.

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