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

Spencer L, Mann C, Metcalfe M, Webb M, Pollard C, Spencer D, Berry D, Steward W, Dennison A.

Department of HPB and Pancreatic Surgery, Leicester General Hospital, Gwendolen Road, Leicester LE5 4PW, UK. lspencer@doctors.org.uk

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.

PMID: 19493674 [PubMed - indexed for MEDLINE]