PROSTATE CANCER

Amelioration of risk by omega-3 modified by COX-2

Dietary intake of long-chain omega-3 polyunsaturated fatty acids might protect against aggressive prostate cancer. This effect is modified by a genetic variation in cyclo-oxygenase-2 (COX-2), a key enzyme in fatty acid metabolism and inflammation, Fradet *et al.* report.

Previous research has shown that omega-3 fatty acids, found in foods such as oily fish and seafood, confer a protective effect against prostate cancer. The current research focuses on dietary factors that interact with genes involved in inflammation in advanced prostate cancer. Variations in the COX-2 gene might affect the capability of this enzyme to metabolize fatty acids or to regulate inflammation, both of which can alter the risk of prostate carcinogenesis.

The researchers carried out a case-control analysis of 466 men with aggressive prostate cancer and 478 healthy controls, matched by age and ethnicity.

Men were divided into four groups according to levels of omega-3 fatty acid intake, determined by means of a dietary questionnaire. COX-2 genotyping was performed in all participants.

“We detected strong inverse (protective) associations between increasing intake of long-chain omega-3 polyunsaturated fatty acids and more advanced prostate cancer,” says senior author John Witte, of the University of California, San Francisco. Men in the highest quartile of omega-3 fatty acid consumption had a 63% reduced risk of prostate cancer compared with men in the lowest quartile. “This association held even if men had a high-risk genetic variant in the COX-2 gene,” adds Witte. In contrast, men with this variant (single nucleotide polymorphism rs4648310) but a low intake of omega-3 fatty acids had a substantially increased risk of more advanced prostate cancer.

Witte and colleagues’ findings suggest that the likelihood of prostate carcinogenesis occurring is altered by an interaction between long-chain omega-3 polyunsaturated fatty acids and the COX-2 enzyme. “Our results further support the hypothesis that long-chain omega-3 polyunsaturated fatty acids may modify prostate inflammation through the cyclo-oxygenase pathway,” Witte concludes.

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