A low dietary ratio of omega-6 to omega-3 Fatty acids may delay progression of prostate cancer.

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Abstract
Prostate cancer (PCa) is the second leading cause of cancer-related deaths in men. Studies show that consumption of polyunsaturated fatty acids (PUFA) modulates the development and progression of prostate cancer. High amounts of omega-6 fatty acids have been linked with increased prostate cancer risk, whereas omega-3 fatty acids have been shown to inhibit PCa growth. However, because omega-3 and omega-6 are both essential fatty acids and part of a complete diet, it is more relevant to determine the ideal ratio of the two that would allow patients to benefit from the therapeutic properties of omega-3 fatty acids. LNCaP prostate cancer cells were treated with dietary-based ratios of omega-6 to omega-3 fatty acids under hormone-deprivation conditions, and effects on various cellular processes were determined. A low omega-6 to omega-3 PUFA ratio can delay the progression of cells toward castration-resistance by suppressing pathways involved in prostate cancer progression, such as the Akt/mTOR/NFκB axis. It also suppresses the expression of cyclin D1, and activation of caspase-3 and annexin V staining shows induction of proapoptotic events. Taken together, our data demonstrates that maintaining a low omega-6 to omega-3 fatty acids ratio can enhance efficacy of hormone ablation therapy.

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