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Omega-3 Fatty Acid Supplementation in Cancer Therapy : Does Eicosapentanoic Acid Influence the Radiosensitivity of Tumor Cells?

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Abstract

PURPOSE: : The aim of this study was to evaluate whether the omega-3 polyunsaturated fatty acid cis-5,8,11,14,17-eicosapentanoic acid (EPA) can enhance the radiosensitivity of different human tumor cell lines.

MATERIALS AND METHODS: : Colon adenocarcinoma cells HT-29, and two glioblastoma multiforme tumor cells T98G and U251 were cultured under standard conditions. Cell growth was observed during administration with different concentrations of EPA, using it as the free fatty acid dissolved in ethanol or bound to bovine serum albumin. To investigate the influence of EPA (free and bound) on radiosensitivity, tumor cells were pretreated 30 minutes or 24 hours prior to irradiation with the fatty acid. Cell survival was measured by colony-forming assays.

RESULTS: : When combined with irradiation, incubation with EPA was found to result in enhanced radiosensitivity with substantial variation: while there was strong radiosensitization for HT-29 and U251 cells, almost no effect for T98G cells was observed. A marked radiosensitization was clearly dependent on the treatment schedule.

CONCLUSION: : The observations suggest that EPA is not only a nutritional adjuvant but also may be a potential candidate to enhance the efficacy of irradiation on human cancer cells.

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