The vitamin-like dietary supplement para-aminobenzoic acid enhances the antitumor activity of ionizing radiation.


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PURPOSE: To determine whether para-aminobenzoic acid (PABA) alters the sensitivity of tumor cells to ionizing radiation in vitro and in vivo. METHODS AND MATERIALS: Cellular proliferation was assessed by WST-1 assays. The effects of PABA and radiation on tumor growth were examined with chick embryo and murine models. Real-time reverse transcriptase-polymerase chain reaction and Western blotting were used to quantify p21CIP1 and CDC25A levels. RESULTS: Para-aminobenzoic acid enhanced (by 50%) the growth inhibitory activity of radiation on B16F10 cells, whereas it had no effect on melanocytes. Para-aminobenzoic acid enhanced (50-80%) the antitumor activity of radiation on B16F10 and 4T1 tumors in vivo. The combination of PABA and radiation therapy increased tumor apoptosis. Treatment of tumor cells with PABA increased expression of CDC25A and decreased levels of p21CIP1. CONCLUSIONS: Our findings suggest that PABA might represent a compound capable of enhancing the antitumor activity of ionizing radiation by a mechanism involving altered expression of proteins known to regulate cell cycle arrest.

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