Coadministration of 7-geranyloxycoumarin and x radiation increased apoptosis in mouse colon cancer cells

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Abstract

Introduction

Colorectal cancer (crc) is one of the most common malignancies worldwide with high mortality rate. despite combinatorial use of chemical anticancer agents, crc patients still suffer from metastasis and drug resistance. to introduce a novel therapeutic strategy, we examined cytotoxic effects of 7-geranyloxycoumarin in combination with x radiation in vitro.

Methods

Mouse colorectal carcinoma cells, ct26 cell line, were treated with 10 Âµg/ml 7-geranyloxycoumarin for 24 h, irradiated with x radiation in different doses (2, 4 and 6 gry), and recovered for 72 h. to better evaluate combinatorial effects, untreated cells and cells treated with 0.4% dmso were also subjected to radiotherapy followed by 3 days recovery. then, quantitative assessment of cell viability was done using alamarblue, and apoptosis was detected by annexin v-pi staining and flow cytometry

Results

Cell viability assay indicated that pretreatment of ct26 cells with 7-geranyloxycoumarin followed by 4 gry radiation increased cytotoxicity up to 28%, as compared with control cells. improvement of toxicity was calculated as 23% and 25% when 7-geranyloxycoumarin was used in combination with 2 and 6 gry radiation, respectively. in addition, 25% apoptotic cells were detected after 7-geranyloxycoumarin treatment and 4 gry radiation, while this amount was less than 4% in all other control treatments.

Conclusion

Findings of present study indicated that coadministration of 7-geranyloxycoumarin and x radiation could be considered as a novel therapeutic approach against crc cells. nevertheless, more research is required to determine efficacy of this combination in vivo.

Keywords

7-geranyloxycoumarin, x radiation, colorectal cancer cells