Albendazole-cyclodextrin complex: enhanced cytotoxicity in ovarian cancer cells.

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Abstract

BACKGROUND:
Over recent years, we have identified a potentially new indication for albendazole (ABZ) namely that of an anticancer agent. Our recent data indicate that besides regional use, the drug is quite likely to be useful as a systemic anticancer agent. However, with extremely low solubility, ABZ has to be prepared in a biocompatible solubilized form before any systemic evaluation is possible. The present study aimed at preparing soluble ABZ and evaluating its in vitro antiproliferative efficacy and toxicity.

EXPERIMENTAL DESIGN:
Using beta-cyclodextrins (CDs), various formulations of ABZ were prepared and tested in cell culture for antiproliferative efficacy, cell integrity and cell toxicity against human ovarian cancer cell lines 1A9, OVCAR-3 and SKOV-3. Hepatocytes isolated from patients undergoing liver tumor resection were used for toxicity evaluations.

RESULTS:
Treatment of tumor cells with ABZ-CD + citric acid (CA) solution led to dose-dependent inhibition of cell proliferation. Compared to an ethanolic solution of ABZ, ABZ-CD + CA increased the antiproliferative efficacy of ABZ. Furthermore, in contrast to the ethanolic solution, ABZ-CD-CA complex profoundly
(p<0.001) reduced the number of OVCAR-3 colonies formed. Fresh human hepatocytes exposed for 3 days to the highest ABZ concentration used in the study (1 microM), revealed no drug toxicity.

CONCLUSION:

Complexation of ABZ with beta-cyclodextrin leads to the formation of an ABZ solution with potent antiproliferative effects. This solution may find clinical value as an intravenous anticancer agent.

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