Evaluation of the cytotoxicity and mechanism of action of 2- acetylpyridine para-chloro-benzoylhydrazone to glioma cells

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INTRODUCTION: Cancer is the leading cause of death in economically developed countries and the second leading cause of death in developing countries. Although brain tumors constitute only 1-2% of tumors in adults, they have a poor prognosis and chance of survival of patients is generally very low. Gliomas, particularly glioblastomas, represent the most malignant primary brain tumor. Hydrazones are an important class of compounds that have numerous applications, including anti-tumor activity. OBJECTIVES: Evaluate the cytotoxicity and mechanism of action the 2-acetylpyridine para-chloro-benzoylhydrazone (H2AcpClPh) in gliomas cells. MATERIALS AND METHODS: In the present study, were evaluated their cytotoxic activity and mechanism of action of H2AcpClPh against U87 (expressing wild-type p53 protein) and T98 (expressing mutant p53 protein) glioma cells. The cytotoxicity was measured by 3 - (4,5-dimethyl-2-thiazolyl) -2,5-diphenyl-2H-tetrazolium bromide assay (MTT), which measures the metabolic cell viability. Cell cycle phase distribution was analyzed using propidium iodide staining and apoptosis was measured by FITC-annexin V and PI staining followed by flow cytometry. DISCUSSION AND RESULTS: The results showed that hydrazone was highly cytotoxic against U87 and T98 cells. H2AcpClPh induces phase arrest in U87 and T98 cells and increased DNA sub diploid in dependent concentration and time. T98 cells were less sensitive to the action of the compound which can be related to p53 status, since this protein is involved in the repair mechanism of the cells. The apoptosis was confirmed using Annexin- V/PI double staining. The results showed that the occurrence of early and late apoptosis is dependent on both concentration and time. Necrotic death was rarely observed. CONCLUSION: The results showed that hydrazone is highly cytotoxic for cells evaluated and that your antitumor effect is associated with cell cycle arrest and subsequent apoptotic death. According to the results, the compound studied has potential use as a prototype of antitumor drugs.

Key words: Hidrazones, mechanism of action, glioma cells.
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