Comparative study for toxic Effects of Camptothecin in Cancer and Normal Cells

The goal of oncologists of chemotherapy is to minimize damage to normal cells and to enhance the toxic effect on cancer cells. In terms of chemotherapy, a drug is useful when there is significant distance between its necrotic and apoptotic effect. Therefore, the present study was to understand the distance between necrotic effect and apoptotic nature of Camptothecin (CPT) as an anticancer drug in human epithelial pharyngeal carcinoma tissue cells (HEp-2) and MRC-0 normal cells. Cytotoxicity, cytosolic enzyme lactate dehydrogenase (LDH) and DNA fragmentation and caspase-8 were assessed in HEp-2 cells and MRC-0 normal cells under unexposed and CPT exposed conditions. The MTT assay showed that CPT inhibited the proliferation of HEp-2 cells in a dosedependent manner with an IC₅₀ of 50.0 ± 22.0 μg/ml. However, the inhibition effect of CPT on MRC-0 cells was about 20% at concentration 6×10⁻¹ μg/ml. On the other hand, the significant (P<0.05) increase in LDH released activity was observed in MRC-0 cultured cells when exposed to concentrations 2×10⁻¹ μg/ml and above. The activity of caspase-8 in HEp-2 cells at IC₅₀ concentration was 8.1 folds greater than unexposed cells. Caspase-8 activity on MRC-0 cells was not significantly different as compared to unexposed MRC-0 cells. The DNA ladder formation also confirmed the results obtained by MTT and LDH assay. Based on the results obtained in this study, there is no significant distance between necrotic effect and apoptotic nature of CPT in both cancer and normal cells. Hence using this model for newly developed anticancer drugs at primary steps can be considered as a model for the toxicity evaluation of the compounds.

Keywords: Necrosis; Apoptosis; Camptothecin; Cancer cells; Normal cells

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