Study of Vincristine Effect on Normal Proliferating Lymphocytes and Lymphoma Cell Line BCL1

Shahhosseini M\(^1\), Ardestani K S\(^2\), Yaraee R\(^3\)

\(^1\)Department of Immunology, Shahed University, Tehran, Iran, \(^2\)IBB Research Center, Tehran University, \(^3\)Immunoregulatin Research Center, Shahed University, Tehran, Iran

Background: Proliferation and apoptosis of lymphocytes are essential parts of the immune system. Most anti-cancer chemotherapy drugs such as vincristine target cell cycle and induce apoptosis in cancer cells, furthermore, more dividing cells, undergo more apoptosis, which may also include the normal proliferating lymphocytes responsive to malignancies as well. Materials and Methods: In this study, the effects of different concentration of vincristine at three different time periods on resting and proliferating spleen lymphocytes were evaluated and compared with the effect of the drug on mouse lymphoma cell line BCL1. The cytotoxicity of vincristine was determined by MTT assay and IC50 was calculated for all periods. The cells were also stained with double staining acridine orange and ethidium bromide, were observed with fluorescence microscope and the percentage of apoptotic cells were determined. Results: MTT results showed that vincristine at the concentrations of 20 and 10 μg/ml caused cell death in both resting and proliferating lymphocytes but concentrations <5 didn’t show any significant cytotoxic effect while concentration of 5 and 2 μg/ml indicated significant cytotoxic effect on BCL1 cells. The percentage of the apoptotic cells which were affected by different concentrations of the drug was proportional in two methods i.e. (fluorescence microscope and MTT assay). Conclusion: The toxic effect of vincristine on normal cells is highly dependent on time and the activation of the cells.

Keywords: Apoptosis, Proliferation, BCL1 (lymphoma cell line), Vincristine, Spleen Lymphocyte