Original Paper

Effect of valproic acid on Expression of Bim gene and viability of ovarian cancer cell line A2780

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Abstract

Background and Objective: Ovarian cancer is the fifth common cancer among women and the number of new cases is increasing. Valproic acid is a histone deacetylase inhibitor effectively used to treat epilepsy and bipolar disease. Recently, this compound has attracted attention as an anti-cancer agent. Bim is one of the most important genes of mitochondrial pathway of apoptosis, and it plays an important role in the biology of cancer. Expression of this gene is greatly reduced in ovarian cancer. This study was done to evaluate the effect of valproic acid on the viability of ovarian cancer cells, apoptosis and Bim gene expression in A2780 line.

Methods: In this experimental study, the human ovarian cancer cells (A2780) were grown in RPMI-1640 medium in appropriate culture conditions. The cells were treated by various concentrations valproic acid (1-30 mM) and were incubated for 24, 48 and 72 hours. After the incubation of period, cell viability was investigated using MTT. Apoptosis was analyzed by flow-cytometry method in the cells were treated by valproic acid. The Real time PCR test was used to assess the effect of this drug on the expression of Bim gene.

Results: The results of MTT assay showed that valproic acid reduced the viability of A2780 cells, and this effect was time and dose-dependent. The reduction of cell viability at 30 mM concentration and 72 hours after treatment, was maximum and statistically significant ($P<0.05$). Exposure to valproic acid significantly increased the percentage of apoptotic cells ($P<0.05$). Also, Valproic acid significantly increased the expression of Bim ($P<0.05$).

Conclusion: Valproic acid reduced viability in ovarian cancer cell line A2780. Valproic acid increased cell death by altering the expression of genes involved in apoptosis in ovarian cancer cell line A2780.

Keywords: Ovarian cancer cell line A2780, Valproic acid, Viability, Bim gene, MTT method, flow-cytometry

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