

Original Paper

Effect of valproic acid and radiotherapy on viability of MCF-7 breast cancer cell line

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Abstract

Background and Objective: Valproic acid is used in the epilepsy, bipolar and migraine therapy. As a histone deacetylase inhibitor, Valproic acid has been recently under investigation in cancer treatment, either alone or in combination with either chemotherapy or radiotherapy. This study was done to determine the effect of Valproic acid and radiotherapy on viability of MCF-7 breast cancer cell line.

Methods: In this descriptive - analytic study, MCF-7 cell line was obtained from the Iranian Pasteur Institute. The cells were treated and incubated by different concentrations of Valproic acid (1, 2, 4, 8, 16, 32, 64 and 128 mM) either alone or in combination with various dosages (0.5, 2, 4, 6 and 8 Gray) of radiotherapy. After cell viability assay, using the Neutral red staining, the most nearest results to LD50 were selected. Cell viability was evaluated with trypan blue staining.

Results: The most nearest concentrations of LD50 was doses of 2, 8 and 16 mM of valproic acid and dosage of Gray 4 of radiation. There was a significant dose-dependent correlation between reduction of cell viability with valproic acid concentration ($P < 0.05$).

Conclusion: Valproic acid, either alone or combination with radiotherapy caused a significant decline in the cell viability of MCF-7 breast cancer cell line.

Keywords: Breast cancer, MCF-7 cell line, Valproic acid, Radiotherapy, Cell viability

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