Effect of valproic acid and zebularine on SOCS-1 and SOCS-3 gene expression in colon carcinoma SW48 cell line

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Abstract

Background: Two epigenetic modifications such as histone acetylation and DNA methylation have been known as critical players of gene regulation. Hypermethylation and deacetylation of suppressors of cytokine signaling family SOCS-1 and SOCS-3 have been shown in many solid cancers. Previously, we evaluated the effect of 5-aza-2'-deoxycytidine and valproic acid on hepatocellular carcinoma and colon cancer cells.

Aim: The present study was designed to assess the effect of valproic acid in comparison to zebularine on SOCS-1 and SOCS-3 gene expression, cell growth inhibition and apoptosis induction in colon carcinoma SW48 cell line.

Materials and methods: SW48 cells were treated with valproic acid or zebularine for 24 h and 48 h. The effect of the compounds on cell viability, SOCS-1 and SOCS-3 gene expression, and apoptosis induction was evaluated. Reverse transcription polymerase chain reaction analysis and flow cytometry were applied.

Results: Both agents inhibited cell growth in a time- and dose-dependent fashion. The apoptotic effect was observed in cells treated with valproic acid (7.5 μM) but not zebularine (75 μM). The valproic acid but not zebularine upregulated SOCS-1 and SOCS-3 gene expression.

Conclusion: Epigenetic modulation can reactivate silenced tumor suppressor genes SOCS-1 and SOCS-3 through histone acetylation resulting in apoptosis induction.