In Vitro Effect of the Histone Deacetylase Inhibitor Valproic Acid on Viability and Apoptosis of the PLC/PRF5 Human Hepatocellular Carcinoma Cell Line

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Abstract

The nucleosome is the fundamental building block of eukaryotic chromatin formed by DNA and histone proteins. Chromatin modifications such as acetylation, methylation, and phosphorylation are necessary for protection, replication, and gene transcription. Histone deacetylases (HDACs) are a group of enzymes that remove acetyl groups to re-establish positive charges on histones and aberrant deacetylation may lead to tumorigenesis in different tissues. Histone deacetylase inhibitors (HDACIs) are a class of chemotherapeutic agent that can reactivate gene expression and inhibit the growth of tumor cells by histone deacetylase inhibition. HDACI valproic acid (VPA) has shown potent anticancer effects in vitro and in vivo. Previously, we reported that VAP can inhibit the growth and induce apoptosis of human colon carcinoma HT 29 and hepatocellular carcinoma HepG 2 cells. The aim of the present study was to access the effect of VPA on proliferation and apoptosis of the human hepatocellular carcinoma (HCC) PLC/PRF5 cell line.

MATERIALS AND METHODS:

PLC/PRF5 cells were treated with VPA and then MTT and flow cytometry assays were used to determine the effects on viability and apoptosis, respectively.

RESULTS:

VPA inhibited cell growth and induced apoptosis in PLC/PRF5 cells significantly.

DISCUSSION:

Our results clearly demonstrated that VPA has inhibitory and apoptotic effects.

CONCLUSION:

VPA can significantly inhibit the growth of HCC cells and play a significant role in apoptosis induction.

KEYWORDS:

Valproic acid; proliferation; apoptosis; hepatocellular carcinoma