Effect of Curcumin and Trichostatin A on the Expression of DNA Methyltransfrase 1 in Hepatocellular Carcinoma Cell Line Hepa 1-6

Masumeh Sanaei , Fraidoon Kavoosi

Abstract: (132 Views)

Background: Hepatocellular carcinoma (HCC), primary liver cancer, is a major health problem and the third most common cause of cancer-related deaths worldwide. Epigenetic modulations are essential for the maintenance of gene expression patterns in mammals. Disruption of these processes can lead to silenced gene and malignant cellular transformation. The current study was designed to compare the effect of curcumin with trichostatin A (TSA) on DNA methyltransferase 1 (DNMT1) gene expression, cell growth inhibition, and apoptosis induction in HCC Hepa 1-6 cell line.

Materials and Methods: Hepatocellular carcinoma Hepa 1-6 cell line was purchased from the National Cell Bank of Iran-Pasteur Institute, treated with curcumin (1, 5, 10, 25 and 50 μM) and TSA (0.5, 1, 2.5, 5 and 10 μM), and the MTT assay was performed. Then, flow cytometry assay and Real-Time RT-PCR analysis were performed with curcumin and TSA treatments. Statistical comparisons between groups were performed using ANOVA (one-way ANOVA) and Turkey test. A significant difference was considered as $P < 0.05$.

Results: Both treatments showed significant inhibitory and apoptotic effects, besides reducing the expression of DNMT1. The relative expression of DNMT1 gene in the curcumin-treated groups were 0.7 to 0.3 ($P <0.001$) and in the TSA treated groups were 0.5 to 0.19 ($P <0.001$).

Conclusion: The curcumin and trichostatin A (TSA) can inhibit cell viability and induce apoptosis somehow through epigenetic modification. The curcumin indicated a more significant apoptotic effect than TSA.

Keywords: Apoptosis, Curcumin, DNMT1, Trichostatin