Effect of 5-aza-2ˈ-deoxycytidine on *p27Kip1*, *p21Cip1/Waf1/Sdi1*, *p57Kip2*, and *DNA methyltransferase 1* Genes Expression, Cell Growth Inhibition and Apoptosis Induction in Colon Cancer SW 480 and SW 948 Cell Lines

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Abstract

Background: Dysregulation of the cell cycle has been reported in various cancers. Inactivation of the cyclin-dependent kinases inhibitors (CDKIs), CIP/KIP family, such as *p21Cip1/Waf1/Sdi1*, *p27Kip1*, and *p57Kip2* genes because of hypermethylation has been shown in several cancers. Treatment with DNA demethylating agent 5-aza-2ˈ-deoxycytidine (5-Aza-CdR) has been indicated that affect genomic methylation and resulting in silenced genes reactivation in colon cancer. Previously, we evaluated the effect of 5-Aza-CdR on *DNA methyltransferase 1* (*DNMT1*) gene expression in hepatocellular carcinoma (HCC) which encouraged us to design the current study. The present study aimed to evaluate the effect of 5-Aza-CdR on *p21Cip1/Waf1/Sdi1*, *p27Kip1*, *p57Kip2*, and *DNAT1* genes expression, cell growth inhibition and apoptosis induction in colon cancer SW 480 and SW 948 cell lines. **Materials and Methods:** The effect of 5-aza-CdR on the SW 480 and SW 948 cells growth, apoptosis induction and genes expression were assessed by MTT assay, flow cytometry, and real-time quantitative reverse transcription-polymerase chain reaction (qRT-PCR) analysis respectively. **Results:** 5-aza-CdR inhibited cell growth as time- and dose-dependent manner significantly ($P<0.001$). The agent reactivated *p15INK4*, *p16INK4*, *p18INK4*, and *p19INK4* genes expression and induced apoptosis at a concentration of 5 μM significantly. Besides, 5-aza-CdR had a more significant effect on the SW 480 cell line in comparison to SW 948 cell line. **Conclusion:** 5-Aza-CdR plays a key role in the up-regulation of *p21Cip1/Waf1/Sdi1*, *p27Kip1*, and *p57Kip2* and down-regulation of DNMT1 genes resulting in cell growth inhibition and apoptosis induction. **[GMJ.2020;9:e1899]** DOI:10.31661/gmj.v9i0.1899

Keywords: 5-aza-CdR; *Cip/Kip* Genes; *DNMT1*; Colon Cancer