

Cytotoxicity effects of new analogues of combretastatin as selective tubulin polymerization inhibitor in human carcinoma cell line

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Background and Aims: This study was designed to evaluate cytotoxicity effects of new analogues of combretastatin as selective tubulin polymerization inhibitor in human carcinoma cell line.

Methods: HeLa Cell line was selected for present study and obtained from the National Cell Bank of Iran (NCBI). HeLa was cultivated under conditions recommended by their respective depositors. Cell culture reagents came from Life Technologies Inc. (GIBCO BRL). The cells were counted and cultured in 96-well microtiter plates. Each plate contained 10^4 cells in 10% FBS in DMEM media. The cells were incubated for 24 hours and then exposure with different concentrations (10, 25, 40, 50, 60 and $100\mu\text{M}$) of new analogues of combretastatin in 24, 48 and 72 hours. The control group was cultured in 10% FBS in DMEM medium. Estimation of cytotoxicity in different groups were mediated by a rapid colorimetric assay for mitochondrial dehydrogenase activity. Cell suspensions ($100\mu\text{L}$; 10^4 cells/mL) were seeded into 96-well microtiter plates and $100\mu\text{L}$ drug solution was added at various concentrations (25, 40, 50, 60 and $100\mu\text{M}$). Following different times $20\mu\text{L}$ MTT solution (5 mg/mL in PBS) was added to each well and incubation was then continued for another 4 h at 37°C . At last, samples were analysis by spectrophotometric at 540 nm.

Results: The mean number of whole cells and living cells were considered as proliferation and survival rates respectively. Increasing of concentration and time of exposure was caused decreasing of viability percent and proliferation rate in HeLa cells compare with control group. Effect of 139 and 151 compounds on IC_{50} were significantly higher than that of the control group.

Discussion: However reduced cell viability, where this occurred, is exclusively due to mitosis inhabitation. Microtubules polymerization was inhibited with combretastatin analogues that can inhibit the mitosis.

Keywords: Combretastatin; HeLa cell; IC_{50} ; tubulin polymerization