Abstract

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Albendazole (ABZ) is a benzimidazole anthelmintic widely used for the treatment of parasitic diseases in man and animals. The mechanism of action is based on inhibition of microtubule polymerization by binding of ABZ to the β-subunit of tubulin in parasites. As a result, it subsequently leads to the disruption of vital functions of the parasite and to its death. After elucidation of this mechanism, ABZ was tested as a potential anticancer agent. It has been shown that it is able to inhibit proliferation of some cancer cell lines. In this study, we examined the effect of ABZ on cell proliferation *in vitro*. For the purpose of our experiment we used cell lines derived from colorectal carcinoma – SW 480 and SW 620 together with a cell line NCM 460 isolated from normal colonic mucosa. The cells were treated with ABZ in the concentration range of 0.01 - 10 μM for 24, 48 and 72 hours. Cell viability was determined using WST-1 assay and Neutral Red Uptake Test (NRU). ABZ inhibited cell proliferation in a concentration-dependent and time-dependent manner, which was shown using both methods. We calculated the IC_{50} values for all tested cell lines at the time interval of 72 hours of treatment with ABZ. The cell line SW 480 appeared as the most sensitive to ABZ. Comparing both methods used (WST-1 and NRU), the WST-1 assay was more sensitive. Using flow cytometry, we also measured cell cycle distribution of SW 480 cells treated with ABZ in concentration range 0.2 - 1 μM for 24 hours. Increasing concentrations of ABZ caused accumulation of cells in G2/M phase of the cell cycle in comparison with the control. In conclusion, ABZ in concentrations lower than 1 μM causes cell cycle arrest in G2/M phase and inhibits proliferation of colorectal cancer cells *in vitro*.