Induction of G1 cell cycle arrest and apoptosis by berberine in bladder cancer cells.


Source
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Abstract
Bladder cancer is the ninth most common type of cancer, and its surgery is always followed by chemotherapy to prevent recurrence. Berberine is non-toxic to normal cells but has anti-cancer effects in many cancer cell lines. This study was aimed to determine whether berberine inhibits the cell proliferation and induces cell cycle arrest and apoptosis in BIU-87 and T24 bladder cancer cell line. The superficial bladder cancer cell line BIU-87 and invasive T24 bladder cancer cells were treated with different concentrations of berberine. MTT assay was used to determine the effects of berberine on the viability of these cells. The cell cycle arrest was detected through propidium iodide (PI) staining. The induction of apoptosis was determined through Annexin V-conjugated Alexa Fluor 488 (Alexa488) staining. Berberine inhibited the viability of BIU-87 and T24 cells in a dose- and time-dependent manner. It also promoted cell cycle arrest at G0/G1 in a dose-dependent manner and induced apoptosis. We observed that H-Ras and c-fos mRNA and protein expressions were dose-dependently and time-dependently decreased by berberine treatment. Also, we investigated the cleaved caspase-3 and caspase-9 protein expressions increased in a dose-dependent manner. Berberine inhibits the cell proliferation and induces cell cycle arrest and apoptosis in BIU-87, bladder cancer cell line and T24, invasive bladder cancer cell line. Berberine can inhibit the oncogenic H-Ras and c-fos in T24 cells, and can induce the activation of the caspase-3 and caspase-9 apoptosis. Therefore, berberine has the potential to be a novel chemotherapy drug to treat the bladder cancer by suppressing tumor growth.

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