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Ellagic Acid Enhanced Apoptotic Radiosensitivity via G1 Cell Cycle Arrest and γ-H2AX Foci Formation in HeLa Cells in vitro

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Abstract : Radiation therapy is an effective vital strategy used globally in the treatment of cervical cancer. However, radiation efficacy principally depends on the radiosensitivity of the tumor, and not all patient exhibit significant response to irradiation. A radiosensitive tumor is easier to cure than a radioresistant tumor which later advances to local recurrence and metastasis. Herbal polyphenols are gaining attention for exhibiting radiosensitization through various signaling. Current work focuses to study the radiosensitization effect of ellagic acid (EA), on HeLa cells. EA intermediated radiosensitization of HeLa cells was due to the induction γ-H2AX foci formation, G1 phase cell cycle arrest, and loss of reproductive potential, growth inhibition, drop in the mitochondrial membrane potential and protein expression studies that eventually induced apoptosis. Irradiation of HeLa in presence of EA (10 μM) to doses of 2 and 4 Gy γ-radiation produced marked tumor cytotoxicity. EA also demonstrated radio-protective effect on normal cell, NIH3T3 and aided recovery from the radiation damage. Our results advocate EA to be an effective adjuvant for improving cancer radiotherapy as it displays striking tumor cytotoxicity and reduced normal cell damage instigated by irradiation.

Keywords : apoptotic radiosensitivity, ellagic acid, mitochondrial potential, cell-cycle arrest
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