

Radioprotective Effects of Selenium and Vitamin-E against 6Mv X-Rays in Human Volunteers Blood Lymphocytes by Micronuclei Assay

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Abstract : Purpose of study: Critical macromolecules of cells such as DNA are in exposure to damage of free radicals that induced from interaction of ionizing radiation with biological systems. Selenium and vitamin-E are natural compound that has been shown to be a direct free radical scavenger. The aim of this study was to investigate the in vivo/in vitro radioprotective effect of selenium and vitamin-E separately and synergistically against genotoxicity induced by 6MV x-rays irradiation in cultured blood lymphocytes from 15 human volunteers. Methods: Fifteen volunteers were divided in three groups include A, B and C. These groups were given selenium(800 IU), vitamin-E(100 mg) and selenium(400 IU) + vitamin-E(50 mg), respectively. Peripheral blood samples were collected from each group before(0 hr) and 1, 2 and 3 hr after selenium and vitamin-E administration (separately and synergistically). Then the blood samples were irradiated to 200 cGy of 6 Mv x-rays. After that, lymphocyte samples were cultured with mitogenic stimulation to determine the chromosomal aberrations with micronucleus assay in cytokinesis-blocked binucleated cells. Results: The lymphocytes in the blood samples collected at 1 hr after ingestion selenium and vitamin-E, exposed in vitro to x-rays exhibited a significant decrease in the incidence of micronuclei, compared with control group at 0 hr. The maximum protection and decrease in frequency of micronuclei(50%) was observed at 1 hr after administration of selenium and vitamin-E synergistically. Conclusion: The data suggest that ingestion of selenium and vitamin-E as a radioprotector substances before exposures may reduce genetic damage caused by x-rays irradiation.

Keywords : x-rays, selenium, vitamin-e, lymphocyte, micronuclei

Conference Title : ICBSO 2016 : International Conference on Biomedical Sciences and Oncology

Conference Location : London, United Kingdom

Conference Dates : March 17-18, 2016