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Protective Effect of 2-Deoxy-D-Glucose on Chemotherapeutic Drugs Induced Damages on Peripheral Blood Lymphocytes Exposed *in-Vitro*

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KEYWORDS Bleomycin; Mitomycin-C; chromosomal aberrations; sister chromatid exchanges

ABSTRACT The effect of 2-deoxy-D-glucose (2-DG), an antimetabolite of glucose was studied in peripheral blood lymphocytes (PBL) exposed to radiomimetic drug bleomycin and an alkylating agent mitomycin-C. The PBL were exposed to 2-DG (5 mM), 30 minutes pretreatment and with Bleomycin (10 to 80 µg/ml) and Mitomycin-C (2 to12 µg/ml) for three hours. The drug as well as 2-DG was removed by washing the cells with HBSS buffer. Then the cells were cultured for 48 hours to study chromosomal aberrations (CA), Translocations (TL) and 72 hours for micronuclei (MN) and Sister Chromatid Exchanges (SCE). Exposures of PBL to Bleomycin and Mitomycin-C showed, a concentration dependent increase in the aberration frequencies, both in the presence and absence of 2-DG. While, the regression analysis showed, that the presence of 2-DG reduced bleomycin induced TL, CA frequencies and Mitomycin-C induced CA and MN frequencies significantly ($P<0.001$) when compared to PBL treated with the drugs alone, Bleomycin induced MN frequencies and Mitomycin-C induced SCE's reduction were not significant. The difference could be attributed to the mechanism of the action of drugs on the cells. Furthermore the alteration in the cell cycle kinetics, suggest that the presence of 2-DG during drug exposure, alter the cellular environment and delay the cell proliferation and provide sufficient time to repair the damages, could resulted in the reduced aberration frequencies.