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Effect of 2-Deoxy-D-Glucose on The Induction of Chromosomal Aberrations in Lymphocytes Exposed *in vitro* to Gamma Radiation at a Dose Rate of 1.0 Gy/Minute

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ABSTRACT The glucose antimetabolite, 2-deoxy-D-glucose (2-DG) has previously been shown to be a radio-sensitiser in certain tumours and a protector in dividing lymphocytes. Since the majority of lymphocytes under normal physiological conditions are in G₀ stage and could be considered to represent tumour-surrounding tissues, they were exposed *in vitro* to gamma radiation from a Co-60 teletherapy unit at a dose-rate of 1.0 Gy / minute, in the presence and absence of 2-DG. The doses studied ranged from control to 4.0 Gy. Whole blood cultures were set up and the various types of chromosomal aberrations were analysed. The results indicated that there was a decrease in the frequency of dicentric chromosomes from the dose of 0.1 Gy up to 4.0 Gy. In case of excessive acentric fragments there was reduction at the doses of 0.05, 0.5, 1.0 and 3.0 Gy. Surprisingly there was an increase of double-minute chromosomes in the doses of 0.05, and from 2.0 to 4.0 Gy. The total chromosomal aberrations showed decrease in the doses from 1.0 to 3.0 Gy. The study indicates that 2-DG could be used as a radio protectant at clinically useful dose of 2.0 Gy and the median dose-rate of 1.0 Gy / min, apart from discussing the reasons for the decrease and increase of the various chromosomal aberrations.

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