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Radio-Protective Effect of 2-Deoxy-D-Glucose in Cervical Cancer Patient's Lymphocytes Exposed *in Vitro* as Estimated by the Comet Assay

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ABSTRACT The main objectives of the present study was two fold, namely, first to evaluate the baseline Single-Strand Breaks (SSBs) frequency in Cervical Cancer patient's and secondly, to study the radio-protective effect of 2-deoxy-D-glucose (2-DG) on such cells when exposed to ionising radiation like that of gamma radiation. The reason for proposing such a study is that the DNA of cancer patients has a general tendency to "break", i.e. "Concept of Common Fragile Sites". This is not yet clearly understood as to whether it is the cause or effect of the pathological processes and necessitates looking into the base-line SSBs in this type of patients. Secondly, the main line of treatment of Cervical Cancer is that of radiotherapy & / or surgery, therefore there is a need to protect the normal cells surrounding the tumour tissue during the course of radiotherapy. This could be achieved by means of a radio-modulator such as 2-DG, which protects normal cells and sensitises the tumour tissue, thus acting as a double-edged sword. Hence the study was designed to evaluate the SSBs by Comet Assay (Single cell Agarose Gel Electrophoresis – SAGE) using a silver staining method, which does not require the usage of fluorescent microscopy and can be analysed with the aid of a simple light microscopy. The results showed that the Cervical Cancer patient's peripheral blood lymphocytes are not entirely fragile and the radiation exposure leads to increasing levels of DNA SSBs, which is reduced by 2-DG showing that the compound can be used as an adjuvant to radiotherapy.