

Radiosensitizing effects of 2-deoxy-D-glucose and ferulic acid on mouse Ehrlich's Ascites Carcinoma in Swiss albino mice

Authors:

**Bandugula Venkata
Reddy, Nagarajan
Rajendra Prasad.**

Institution:

Department of Biochemistry
and Biotechnology,
Annamalai University,
Annamalainagar-608 002,
Tamilnadu, India.

Corresponding author:

**Nagarajan Rajendra
Prasad.**

ABSTRACT:

The objective of the present study is to evaluate the radiosensitizing activity of combination of 2-deoxy-D-glucose (2DG) and ferulic acid (FA) against Ehrlich's Ascites Carcinoma (EAC) in Swiss albino mice. Extensive DNA damage has been observed in the cells collected from the peritoneal cavity of combined treatment group (2DG+FA+IR) than the other treatment modalities. Treatment of EAC tumor bearing mice with 2DG and FA before 8 Gy of hemi-body γ -radiation has resulted in the significant decrease of tumor volume and tumor weight compared with EAC control group. Further, combination of 2DG and FA along with radiation decreased the viability of tumor cells in the peritoneal fluid of EAC bearing mice. It has been also found that the percentage of EAC apoptotic cells in the peritoneal fluid has been significantly increased in the combined treatment group (2DG+FA+IR) compared with other treatment groups. Combined treatment of 2DG and FA activated caspase-3 and 9, when compared with the treatment given with radiation alone indicated radiosensitizing effect of this combination (2DG+FA). This has been further evidenced by the massive decrease of LDH activity in the 2DG+FA+IR group. On other hand, 2DG and FA combination protects the hematological changes occurred during radiation treatment. Histopathological examinations showed that the combination of 2DG and FA offers protection to normal tissues during radiation treatment. Taken together, the results of the study clearly suggested 2DG and FA combination sensitizes EAC bearing mice to radiation effects at the same time offers protection to normal tissues from radiation-induced damage.

Keywords:

Ehrlich ascites carcinoma; radiosensitization; apoptosis; 2-deoxy-D-glucose; ferulic acid.