Radioprotective Agents in Radiotherapy-Induced Cell and Tissues Toxicity

Cancer, one of the leading causes of death and morbidity in the world, can affect almost every organ in the body [1]. Cancer involves abnormal cell growth, either benign, with no spread, or malignant, invading other parts of the body. The major reasons cancer develops vary from genetic to lifestyle factors, including tobacco, diet, infections, radiation, stress and obesity [2,3]. Radiation therapy is widely used as a therapy to kill malignant cells as part of cancer therapy. However, radiation therapy involves the use of high doses of radiation and induces undesirable side effects for the patients. The main cause for concern is that not only the tumor cells but also the surrounding normal healthy cells are also exposed to radiation during radiotherapy. So, oxidative stress and subsequent cellular toxicity and macromolecular damages such as DNA damage could occur, resulting in mutagenesis, carcinogenesis and cell death [4-7]. Therefore, for many decades, researchers have been working to develop novel and more effective radioprotectors with fewer side effects. In recent years, several herbal medicines have been developed for this purpose due to their unique properties, such as low toxicity, high availability, and potent antioxidant activity [8,9]. Some experiments have demonstrated the natural products in herbal medicines are good a source as promising radioprotection against radiation-induced toxicity, mainly through their ability to stabilize the cell membranes, anti-inflammatory as well as antioxidant properties, and the prevention of DNA damages [4-6,8,10]. These properties make them emerging supplements for patients undergoing radiotherapy to protect healthy cells from the harmful effects of radiation.

Hence, in this issue, recent studies about the radioprotective effects of herbal medicines as well as natural origin compounds against side effects of radiation will be reviewed. The mechanism of actions and structure relationship activity (SAR) of each compound group will also be discussed.

REFERENCES


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