Short Communication

Role of selenium supplementation in radiotherapy patients

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INTRODUCTION

Selenium is an essential trace element with inhibiting effect on many types of human cancers. Recently, we summarized a number of selenium compounds which screened their anticancer activity of prostate type as well as, of another soft tissues. Radiation is a common mode of cancer therapy whose outcome is often limited due to normal tissue toxicity. It is known that the accumulation of radiation-induced late reactive oxygen species precedes cell death suggesting that metabolism oxidative stress could regulate cellular radiation response.

The aim of this manuscript is to summarize an adjuvant selenium supplementation and reduce the radiation-induced side effects of patients by adjuvant radiotherapy for cancer diseases.

SELENIUM SUPPLEMENTATION IN RADIOThERAPY

To establish guidelines for the selenium supplementation in radiotherapy, Puspitasari et al. (2014) assessed the benefits and risks of selenium supplementation in radiotherapy. Plasma serum or whole blood selenium level were common parameters used to assess the effects of radiotherapy in patients with cancer and selenium supplementation states.

Selenium supplementation improved the general conditions of the patients, their quality of life and reduced the side effects of radiotherapy, however, it depends on the dose of selenium used (Muecke et al., 2014). Influence of selenium on radiogenic collagen destruction was studied by Elango and Subbiak (2015). They found the effect of selenium treatment with a bearing on carcinogenic process to curtail it and the enhancing of the maturity of collagen.

Pre-treatment with antioxidants has been known to have a useful effect against radiation damage. This was confirmed by Karabulut-Bulan et al. (2016). The results indicated that dietary vitamin E and selenium have a potentially protective effect on the small intestine of patients subjected to abdominal radiotherapy.

Muecke et al. (2010) reported selenium supplementation during radiation therapy being effective for increasing blood selenium level in selenium-deficient cervical and uterine cancer patients and reduced the number of episodes and severity of radiation therapy induced diarrhea. Therefater, Muecke et al. (2010, 2014) demonstrated that selenium supplementation had no influence on the effectiveness of the anticancer radiation therapy and did not negatively affect patients long-term survival. In view of the results obtained they considered that selenium supplementation can be a meaningful and beneficial adjuvant treatment in selenium deficient cervical and uterine cancer patients while undergoing pelvic radiation therapy.

Radiation is a common mode of cancer therapy and the accumulation of radiation-induced late reactive oxygen species has been considered as a causative factor in the onset of late radiation effect.

ABSTRACT

This mini review summarized clinical studies of selenium supplementation in radiotherapy. On the basis of these studies it can be proposed that the selenium supplementation improved the general conditions of the patients with cancer diseases, improved their quality of life and reduced the side effects of radiotherapy.

Keywords: Selenium, radiotherapy, cancer diseases.
species proceeds cell death, suggesting that metabolic oxidative stress could regulate cellular radiation response. Eckers et al. (2013) investigated that selenoprotein P overexpression suppressed radiation-induced late reactive oxygen species accumulation and protected normal human fibroblasts from radiation-induced toxicity.

The therapy of thyroid carcinoma with radiiodine caused oxidative stress. The study of this objective was to evaluate the effect of supplementation with selenium and vitamins C and E (Rosario et al., 2016). Their study shows that ablation with radiiodine causes oxidative stress and can be minimized by the use of the supplementation (antioxidants). Complementary and alternative medicine is widely used by cancer patients while being under active treatment with chemo- or radiotherapy.

Wortmann et al. (2016) distributed a standardized questionnaire among patients attending a department of radio-oncology. Most often used complementary and alternative medicine was vitamin D and selenium. Most important goals were to strengthen the immune system and become active. Most patients were satisfied with the methods used.

CONCLUSIONS

On the basis of the obtained knowledge, it can be proposed that the selenium supplementation-improved the general conditions of the patients with the cancer diseases, their quality of life and reduced the side effects of radiology.

REFERENCES


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