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THE USE OF RADIOPROTECTORS IN PRACTICAL MEDICINE

Baymuradov Ravshan Radjabovich,
Alimova Nigina Pulatovna,
Kamalova Shakhnoza Muzaffarovn,
Bukhara State Medical Institute named after Abu Ali ibn Sino
e-mail: feruzanazarova1111@gmail.com

Abstarct
In the world, various drugs are used to reduce the pathological effects of various radiations.

Keywords: radioprotectors, radiation

All over the world, based on the numerous pathological effects of radiation, various chemical and biological compounds have been shown to date as radioprotectors [1]
Scientists [2] studied the effect of the Chinese drug WZYZP (wuzi Yanzong pill) on ionizing radiation-induced testicular damage in mice. The effect of WZYZP on testicular injury was assessed in terms of testicular weight, sperm count and motility, testicular oxidative status, and serum hormone levels. Oral administration of WZYZP for 3 weeks markedly increased testicular mass, sperm count and motility, and attenuated damage to testicular structure. Meanwhile, WZYZP treatment significantly reversed the decline in serum testosterone and the reduction in malondialdehyde and testicular oxidative stress index relative to irradiated mice. In addition, WZYZP effectively prevented the decrease in nuclear antigen expression of proliferating cells in the testes caused by X-ray irradiation.
It was found that melatonin compensates for the effect of irradiation (0.24 Gy), enhances the production of superoxide, and improves the antioxidant function in testis tissues [3].
In a Similar study applied melatonin to damage caused by γ-rays in germ cells (testes). Male C57BL/6 mice were injected with melatonin (100 mg/kg) ip 30 min prior to a single whole body irradiation with γ-irradiation (5 Gy, 1 Gy/min) using a 60Co teletherapy machine. Animals were slaughtered 2, 4 and 8 hours after irradiation, and their testes, together with spermatozoa, were removed and used to determine the total antioxidant capacity (TOA), lipid peroxidation, Western blot analysis, motility and viability of spermatozoa. Melatonin pretreatment significantly inhibited radiation-induced DNA strand breaks and lipid peroxidation. At this time, radiation induces activation of the ATM-dependent apoptotic proteins p53-ATM, p53, P21, cytochrome

C, active caspase-3 and caspase-9 expression, which were significantly reversed in melatonin-pretreated mice. This decrease in apoptotic proteins by melatonin pretreatment was associated with an increase in anti-apoptotic Bcl-x proteins and DNA-PCNA repair proteins in irradiated mice. In addition, the radiation-induced reduction in OSA was significantly reversed in melatonin-pretreated mice.

The following study was conducted to evaluate the protective effect of cimetidine in rats subjected to long-term, low-dose neutron and γ-ray combined irradiation (n-γ LDR). With the exception of the control group, 40 rats were simultaneously exposed to fission neutrons (252Cf, 0.085 mg/h) for 22 h each day and γ-rays (60Co, 0.097 g/h) for 1.03 h once every three days, and the cimetidine groups were administered intragastrically with cimetidine at doses of 20, 80 and 160 mg/kg every day. Testicular parameters were assessed. Cimetidine reduces damage caused by long-term combined exposure to low-power neutrons and γ-radiation using antioxidant and immunomodulatory therapy.

A number of scientists determined the radioprotective effects of silymarin in adult male Sprague-Dawley rats irradiated with γ-rays. After animal experiments and preparation of tissue sections, various histological and histomorphological parameters of the seminiferous tubules, as well as the biological characteristics of Leydig cells, were evaluated using Johnson quantification and Leydig cell apoptosis tunneling analysis. However, the introduction of silymarin improved these indicators precisely at a dosage of 200 mg/kg (because there was also an experimental group using silymarin at a dose of 100 mg/kg). Silymarin can act as a powerful radioprotector and can be used to modulate as well as improve radiotherapy to prevent male reproductive function, especially seminiferous tubules in an animal model; however, its molecular mechanism is still unclear and needs more molecular studies.

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