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N-sterolethanolamin effects in irradiated female rats

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The problem of finding substances with radioprotective properties does not lose its relevance due to the saturation of Ukraine by nuclear facilities, where emergencies or terrorist attacks, on the one hand, could cause significant irradiation of the population, and on the other hand, a list of far from perfect radioprotectors is rather limited.

Over the past 20 years in the scientific literature accumulated a large data array on compounds with adaptogenic effect - N-acylethanolamines. Special feature of this minor class of lipids is that they are normally in the body in extremely small quantities, while in pathological conditions their content may be increased by several orders. These substances have a wide range of biological effects, including membranoprotective, antioxidant, cardioprotective, immunomodulating, anti-inflammatory and other properties.

Endogenous C18 N-acylethanolamines presented in the body are weak ligands of cannabinoid CB1 receptors, but they are able to activate TRPV1-receptors and thus act as endogenous modulators of TRPV1. Many biological effects of compounds of this class are realized by extrareceptor way.

As opposed to unsaturated C18 N-acylethanolamines, saturated 18:0 N-stearoylethanolamine (NSE) does not activate TRPV1 under any experimental conditions, but by its properties can be considered as a compound with cannabimimetic properties. Currently, very little is known about the biological effects of NSE.

We investigated the influence of NSE on some indices of antioxidant protection and the endocrine system in irradiated rats.

Females random breed white rats received daily oral suspension of NSE at a dose of 50 mg / kg for seven days before (1st group) and seven days after (2nd group) one-time X-ray irradiation at a dose of 2 Gy. Intact (3rd group), unirradiated rats that received NSE within 7 days (4th group) and irradiated which not got NSE (5th group) served as controls.

In the terms equal to the 8th day after irradiation, all animals removed from the experiment by guillotine. The content of active antioxidant enzyme (catalase, superoxide dismutase and glutathione peroxidase) and concentration of estradiol, progesterone and 11-oxycorticosteroids were determined in blood plasma.

Exposure of rats resulted in a slight decrease in total protein content, significant drop in catalase activity compared with intact animals, increased activity of superoxide dismutase and significant decrease of glutathione peroxidase activity with the increasing level of TBA-active products. In exposed female rats significantly increased levels of progesterone, little was changed estradiol concentration and more than threefold increased concentration of 11-oxycorticosteroids.

NSE restored catalase activity to the level in intact animals, but only under conditions of use after exposure (2nd group), did not significantly affect the activity of superoxide dismutase and irrespective of the application - before or after irradiation - predetermined glutathione peroxidase activity increase by 2.7-3 times. Under the influence of NSE levels of progesterone and 11-oxycorticosteroids normalized, other indices did not experienced significant changes.

Thus, radioprotective properties are inherent to NSE that deserve further in-depth studies.