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THE STATE OF PROOXIDANT SYSTEM IN RATS' KIDNEYS UNDER ALCOHOLIC INTOXICATION AND ITS COMBINATION WITH LIGHT EXPOSURE

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Introduction. Although the negative effects of excessive alcohol consumption are generally known in the human population, drinking alcoholic beverages is prevalent in society. According to WHO, alcohol abuse contributes to three million deaths per year globally and millions of people's disabilities and organ damage.

In modern life, the use of ethanol is often combined with the influence of other harmful factors, such as the violation of the light regime. A modern person is exposed to light almost all the time. Night shifts, flights, jet lag and active nightlife contribute to the disturbance of circadian rhythms. Normally, the biological rhythms are regulated by melatonin, which is known to be secreted in the dark. Even a slight lighting inhibits its synthesis. It has been shown that melatonin has a wide range of biological effects but its main feature is a powerful antioxidant action.

The aim of the study. To investigate the effects of melatonin on oxidative stress biomarkers (malonic dialdehyde and oxidatively modified proteins) in the kidneys of rats exposed to alcohol intoxication and its combination with constant light exposure.

Material and methods. A subacute alcohol intoxication was induced by intragastric administration of 40% ethanol in a dose of 7 ml/kg of body weight for 7 days. Light exposure was caused by keeping animals under a fluorescent light of 1500 lux intensity for 24 hours a day.

Results. Alcohol intoxication was accompanied by an increase of malonic dialdehyde in rats' kidneys by 28% above the control level along with a decrease of oxidatively modified proteins by 33%. A combination of modified photoperiod with ethanol administration resulted in the elevation of malonic dialdehyde by 34% and a decrease of oxidatively modified proteins in kidneys by 25% lower than the control level. The rise in malonic dialdehyde in case of alcohol intoxication along with the permanent light exposure was significantly higher than that of rats that had alcohol intake under the normal light regime, that might have resulted from a decrease in melatonin synthesis and lack of its antioxidant effect under constant light exposure.

The administration of the melatonin at the dose of 5 mg / kg daily at 20^{00} for 7 days to animals exposed to ethanol intoxication has shown no significant effect on malonic aldehyde and oxidatively modified proteins levels in kidneys. Melatonin intake revealed more effective in normalization of oxidatively modified proteins in case of ethanol combination with constant lighting but the level of malonic dialdehyde remained by 53% above control.

Conclusions. The administration of melatonin against the background of alcohol intoxication or its combination with constant light exposure contributed to the normalization of oxidatively modified proteins in rats' kidneys but had no positive effect in normalization of malonic dialdehyde.

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DETERMINATION OF THE ACTIVITY OF NADH DEHYDROGENASE, SUCCINATE DEHYDROGENASE AND H^+-ATP-ASE IN EXPERIMENTAL DIABETES

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Introduction. Diabetes mellitus, without exaggeration, is considered a non-infectious epidemic of the 21st century. According to research, about 40% of people with diabetes develop chronic kidney disease (CKD). The increased glucose level in the blood and tissues causes the constant generation of free radicals, which damage the lipid and protein components of cells, contribute to the formation and accumulation of reactive oxygen species, which intensify the processes of cell membrane destabilization. Such changes cause a malfunction of one of the main energy processes in the kidneys, namely, the cycle of tricarboxylic acids and partial disconnection