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У збірнику представлені матеріали 106-ї науково-практичної конференції з міжнародною участю професорсько-викладацького колективу Буковинського державного медичного університету (м. Чернівці, 03, 05, 10 лютого 2025 р.) зі стилістикою та орфографією у авторській редакції. Публікації присвячені актуальним проблемам фундаментальної, теоретичної та клінічної медицини.

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EFFECTS OF COMBINED ALCOHOL INTOXICATION AND LIGHT EXPOSURE ON RENAL ANTIOXIDANT SYSTEM IN RATS

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Introduction. Despite the widely recognized negative impacts of excessive alcohol consumption on human health, alcohol use remains common in society. The World Health Organization (WHO) reports that alcohol abuse is responsible for approximately three million deaths annually worldwide, as well as for disabilities and organ damage.

In contemporary life, ethanol consumption frequently coincides with exposure to other harmful factors, including disruptions in light cycles. Modern individuals are often exposed to light nearly constantly, with night shifts, air travel, jet lag, and active nightlife all contributing to disturbances in circadian rhythms. Under normal conditions, these biological rhythms are regulated by melatonin, a hormone primarily secreted in darkness. Even minimal light exposure can inhibit its production. Research has demonstrated that melatonin possesses a broad range of biological effects, with its primary function being a potent antioxidant action.

The aim of the study. The study aims to examine melatonin influence on activity of antioxidant enzymes, specifically catalase, glutathione peroxidase and glutathione-S-transferase in the kidneys of rats subjected to alcohol intoxication and combined alcohol and constant light exposure.

Material and methods. 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 a decrease of catalase activity in rats' kidneys by 21% below the control level along with a decrease of glutathione peroxidase activity by 27% and increase of glutathione-S-transferase activity by 30%. A combination of modified photoperiod with ethanol administration resulted in the decrease of catalase activity by 34% and a decrease of glutathione peroxidase activity in kidneys by 39% lower than the control level. Activity of glutathione-S-transferase was by 37 % higher than the control level. The decrease in the antioxidant enzymes activity and rise of antitoxic glutathione-S-transferase activity in case of alcohol intoxication along with the permanent light exposure was more significant 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. Thus, intensification of free radical generation caused depletion of antioxidant defense.

The administration of melatonin at the dose of 5 mg / kg daily at 20^{00} for 7 days to animals exposed to ethanol intoxication caused normalization of catalase, glutathione peroxidase and glutathione-S-transferase activity in kidneys. Melatonin intake was revealed to be more effective in normalizing catalase activity in case of ethanol combination with constant lighting but the activity of glutathione peroxidase enzyme remained by 21% below control and glutathione-S-transferase activity was by 17% 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 catalase activity in rats' kidneys but revealed less effective in normalization of glutathione peroxidase and glutathione-S-transferase activity in kidneys.

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MITOCHONDRIAL DYSFUNCTION AS A KEY FACTOR IN THE DEVELOPMENT OF PATHOLOGICAL PROCESSES AND DISEASES

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Introduction. Mitochondria play a central role in cellular metabolism, performing several vital functions, including energy production in the form of adenosine triphosphate (ATP) through