МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ
БУКОВИНСЬКИЙ ДЕРЖАВНИЙ МЕДИЧНИЙ УНІВЕРСИТЕТ»

М А Т Е Р І А Л И

104-ї підсумкової науково-практичної конференції
з міжнародною участю
професорсько-викладацького персоналу
БУКОВИНСЬКОГО ДЕРЖАВНОГО МЕДИЧНОГО УНІВЕРСИТЕТУ
06, 08, 13 лютого 2023 року

Конференція внесена до Реєстру заходів безперервного професійного розвитку, які проводитимуться у 2023 році №5500074

Чернівці – 2023

Pazyniuk A.Yu.

PHARMACEUTICAL POLLUTION IN UKRAINE

Department of Pharmacy
Bukovinian State Medical University

Introduction. As the population of our planet continues to grow, so does the need for adequate medical supplies, including chemical-based medicines and care products. Their significant therapeutic effect does not go unnoticed in our lives, similar to the consequences of their use in the form of contamination of water systems and soils do not go unnoticed. Medical waste makes up only 3-5% of the total amount of waste, but it is generally considered the most dangerous. They may contain dangerous infectious bacteria that can cause entire epidemics in the population.

The aim of the work. In 2022 a national report on the state of the natural environment in Ukraine in 2020 was published by the Ministry of Environmental Protection and Natural Resources of Ukraine. According to the data, a total of 5,159.47 million cubic meters were dumped in Ukraine in 2020. The main polluting components of wastewater are ammonium nitrogen - 25.2 tons; biochemical consumption of oxygen– 161.6 tons; suspended substances - 33.2 tons; iron - 278.4 kg; petroleum products – 77.3 kg; nitrates – 11.55 tons; nitrites - 0.2 tons; synthetic detergents – 135.6 kg; phosphates - 3318.8 kg; chemical oxygen consumption - 51.5 tons.

Materials and methods. The main part of the waste is produced by pharmaceutical companies and healthcare institutions. By neglecting the rules of disposal, each of the manufacturers and consumers of medicinal products are responsible for increasing the level of environmental pollution due to their type of activity.

Results. Another reason for the increase of the level of sewage and soil pollution is incomplete metabolism of medicinal products by human and animal organisms. Like humans, domestic animals do not break down the drugs they eat. Instead, they excrete the parts that remain undigested. These drugs and hormones were used to keep the animals from getting sick, and they can stimulate their growth and prevent them from getting injured. Unfortunately, some of these drugs and hormones end up in waterways and groundwater, which contribute to the pollution of the environment. Pharmaceutical pollution has the greatest impact on the organisms of the water ecosystem and wildlife and the work of the sewage process. Studies have shown that chemicals and substances that behave similarly to estrogen can alter male fish's sexual characteristics and alter their ratios. These chemicals can be found in birth control pills and post-menopausal hormone treatments. Moreover, wastes from pharmaceutical enterprises can contribute to the increase in the level of antibiotic resistance. High level of antibiotics in water can lead to the development of resistant bacteria, which will reduce the effectiveness of drugs and ultimately create a global threat of pharmaceutical pollution not only to the environment but also to human health.

Conclusions. Ways to solve the problem can be the correct disposal of drugs, stricter legal requirements, and additional research on the impact of pharmaceutical waste on the environment. More research is desperately needed to assess the potential human effects of pharmaceutical pollution. It will also address the best methods for removing the compounds at treatment plants in a way that is not dangerous to the environment in general. If a significant long-term risk to public health is identified, more aggressive efforts can then be taken to control the problem as required.

Only an integrated approach in this issue will help to reduce the risks of environmental pollution and improve the standard of living for humans and animals.

Rovinskyi O.O.

STUDY OF THE TOXIC INFLUENCE OF CERTAIN MEDICINAL PLANTS ON THE ORGANISM OF RATS

Department of Pharmacy
Bukovinian State Medical University

Introduction. An important characteristic in the process of a potential drug research in addition to the therapeutic properties examitation is studying the index LD50, which characterizes

the degree of drugs toxicity, the range of its pharmacological effects, and also allows evaluation of the examined substance danger to the body in a short-term action.

The aim of the study. To determine the LD50 and simulation of the clinical manifestation of acute poisoning, acute toxicity of Simon poplar leaf extract investigated on white adult lab rats.

Material and methods. The animals of the control group were given an equivalent volume of 1% starch suspension. The period of the animals monitoring was 14 days, during which the animals'appearance, the skin condition, the dynamics of body weight, mortality were evaluated. After the animals were removed from the experiment, macroscopic evaluation and the mass coefficients of the internal organs were determined.

Results. As a result of the experiment, after the single oral intragastric administration of a Simon poplar leaf extract animals of the experimental and control groups maintained motor activity, responded to sound and light stimuli, the processes of defecation and urination were within normal range, respiratory disturbances and convultions were not observed. Reflex excitability was maintained in all the animals, and death of rats was not observed. The dynamics of the rats' body weight after intragastric administration of Simon poplar leaves extract matched the body weigh gain. The consumption food and water in the experimental animals did not differ from the animals of the control group. During the whole experiment period, the animal mortality was not registered. By their size, color, location of the internal organs, experimental rats did not differ from the animals of the control group. The surface of the liver, kidneys and adrenal glands is smooth. The colors, shapes and sizes of the organs are normal. The pancreas is grayish-pink in color, the spleen is full-blooded, elastic, the mucous membrane of the stomach with a pronounced relief of folds, the mucous membrane of the intestine is not changed. In the chest, all the organs are located anatomically correct. The heart muscle in section is dark red, in the lungs the pleural layers are not changed. The mass coefficients of the internal organs indicate the absence of pathological changes.

Conclusions. Therefore, a single intragastric administration of the extract of this medicinal plant material at a dose of 15,000 mg/kg does not induce toxic effects.

Shchudrova T.S.

MELATONIN AMELIORATES RHABDOMYOLYSIS-INDUCED ACUTE KIDNEY INJURY IN RATS

Department of Pharmacology
Bukovinian State Medical University

Introduction. Rhabdomyolysis is the disruption of skeletal muscle integrity leading to the leakage of muscle cell contents, including electrolytes, myoglobin, creatine kinase, lactate dehydrogenase and other intracellular contents into the circulation. Rhabdomyolysis can be caused by different physical or chemical damages such as direct traumatic injury, physical exertion or prolonged bed rest, muscle ischemia, infections, electrolyte and metabolic disorders, genetic disorders, toxins and drugs, as well as temperature-induced states such as neuroleptic malignant syndrome and malignant hyperthermia. AKI is the most common systemic life-threatening complication of severe rhabdomyolysis, which occurs at an incidence ranging between 10 and 55% and is associated with a poor outcome and high mortality. Development of AKI is caused by accumulation of nephrotoxic myoglobin in the kidney and renal hypoperfusion as a result of systemic hypovolemia. Current treatment for rhabdomyolysis-induced AKI relies on supportive therapies (IV fluids, bicarbonate, and hemodialysis) and the mortality remains considerably high. Melatonin is a promising therapeutic agent, possessing cytoprotective, anti-aging, antioxidant, immunomodulatory, oncostatic, anti-inflammatory, and anti-apoptotic properties under the conditions of various pathologies, including renal, which contributes to its active study in order to expand the range of clinical use.

The aim of the study was to evaluate the effects of melatonin (5 mg/kg) on the animal model of rhabdomyolysis-induced AKI.

Material and methods. Research was conducted on 24 nonlinear mature white rats randomly distributed into three groups (n=7): group I – control, group II – rhabdomyolysis-induced AKI