

**МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ  
БУКОВИНСЬКИЙ ДЕРЖАВНИЙ МЕДИЧНИЙ УНІВЕРСИТЕТ»**



## **МАТЕРІАЛИ**

**105-ї підсумкової науково-практичної конференції  
з міжнародною участю  
професорсько-викладацького персоналу  
БУКОВИНСЬКОГО ДЕРЖАВНОГО МЕДИЧНОГО УНІВЕРСИТЕТУ  
присвяченої 80-річчю БДМУ  
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Матеріали підсумкової 105-ї науково-практичної конференції з міжнародною участю професорсько-викладацького персоналу Буковинського державного медичного університету, присвяченої 80-річчю БДМУ (м. Чернівці, 05, 07, 12 лютого 2024 р.) – Чернівці: Медуніверситет, 2024. – 477 с. іл.

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У збірнику представлені матеріали 105-ї підсумкової науково-практичної конференції з міжнародною участю професорсько-викладацького персоналу Буковинського державного медичного університету, присвяченої 80-річчю БДМУ (м. Чернівці, 05, 07, 12 лютого 2024 р.) із стилістикою та орфографією у авторській редакції. Публікації присвячені актуальним проблемам фундаментальної, теоретичної та клінічної медицини.

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to 15% of dairy products, fish and fish cooks, from 7 to 12% of meat products do not meet the requirements of standards for bacteriological indicators. From 1.5 to 10% of food samples contain heavy metals, including mercury, lead, cadmium, copper, zinc, of them from 2.5 to 5% in concentrations exceeding the maximum permissible.

**Conclusions.** Further research on this topic will allow you to study the effect on the body of pesticides in more detail and will allow the correct selection of nutrition, which is the key to good health.

**Sakhatska I.M.**

## **MARKETING ANALYSIS OF DRUGS CONTAINING INULIN USED IN DIABETES**

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**Introduction.** The 21st century is characterized by the rapid spread of diabetes in the world. According to the International Diabetes Federation, 537 million adults in the world live with diabetes, one in 10 suffer from this disease. According to forecasts, by 2030 their number may increase to 643 million or even 700 million. This disease is included in the top three diseases, along with atherosclerosis and cancer that cause early disability and mortality of people. According to world statistics, one person on the planet dies from this disease and its complications every six seconds.

In 2023, 531,200 people in Ukraine were diagnosed with diabetes, last year – 489,934. However, next to every registered one, there are 2-2.5 undiagnosed patients.

Since ancient times, before the discovery of insulin in 1922 and synthetic hypoglycemic drugs (from the mid-1950s), alternative medicine in many countries effectively used various extracts and tinctures from plants to reduce elevated blood glucose levels, mainly in the treatment of type 2 diabetes.

**The aim of the work** is to analyze the range of products available on the pharmaceutical market of Ukraine that contain inulin.

**Materials and methods.** The objects of the study were drugs, dietary supplements and medicinal plant raw materials containing inulin available on the pharmaceutical market of Ukraine. The study was conducted on the basis of pharmacy chains in Chernivtsi, namely «Harmonii», «D.S», «Liulia Piliulia», «Bazhaiemo zdorovia», «Podorozhnyk», «Italiana Farmacia Stasi». In addition, online pharmacies «Dobroho dnia», «apteka 911», electronic resources: [tabletki.ua](https://tabletki.ua), [liki24](https://liki24.com.ua), <https://zt-zelena-apteka.com.ua/>, <https://fitoapteka-ua.com/>, <https://eco-goods.com.ua/>, <https://www.amrita.ua/>, <https://vitamins.in.ua/>, <https://ua.iherb.com/> etc. and data from the electronic directory «Compendium – drugs» were also analyzed. The research used methods of marketing analysis of the range of medicines and statistical processing of the obtained data.

**Results.** Diabetes mellitus is an endocrine disease characterized by the syndrome of chronic hyperglycemia, which is the result of insufficient production and (or) the action of insulin, which leads to violation of all types of metabolism, primarily carbohydrate, as well as damage to the organs and systems of the body. There are two types of diabetes – insulin-dependent and non-insulin-dependent. Treatment with synthetic drugs gives significant therapeutic results and reduces the risk of diabetic complications. It is almost always expedient to prescribe phytopreparations in addition to the main treatment, the advantage of which is a mild, multi-faceted and multi-organ positive effect on the body. It has been proven that patients who actively use phytotherapy need lower doses of insulin and oral hypoglycemic drugs. There are well-known medicinal plants that contribute to the assimilation of carbohydrates by forming mannose and fructose from them, the utilization of which does not require insulin, as a result of which the need for the introduction of the latter decreases. This applies to medicinal raw materials containing inulin.

According to the analysis of inulin-containing products, 123 trade names were found on the pharmaceutical market of Ukraine. It should be noted that in the assortment, mainly, only biologically active supplements with inulin were observed (97.60%). Among the drugs, there are both single-component dietary supplements with inulin (65.57%) and combined (34.42%). A

significant share of the production of these products belongs to the domestic manufacturer, which is 59.2%, while the share of imported manufacturers is 40.8%.

**Conclusion.** Inulin-containing preparations are represented by a considerable assortment. Today insulin is used in medical practice in the complex treatment of diabetes and deserves a positive assessment as it contributes to the reduction of glucose.

**Shchudrova T.S.**

## **PARACETAMOL-INDUCED KIDNEY DAMAGE: THE PROTECTIVE ROLE OF MELATONIN**

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**Introduction.** Paracetamol (acetaminophen) is one of the most commonly used over-the-counter analgesic and antipyretic drugs worldwide. Paracetamol overdose can result in severe liver and kidney damage or even death and, therefore, is a frequent reason for emergency room visits and the most common way of committing a suicide. According to literature and results of our previous research, the nephroprotective effect of pineal hormone melatonin has been shown in various experimental models of acute renal injury (AKI). Numerous studies established the antioxidant, anti-inflammatory, anti-apoptotic, immunomodulatory, and cytoprotective effects of melatonin, and showed its ability to restore the function and structure of the kidneys.

**The aim of the study** was to evaluate the effects of exogenous melatonin on the animal model of paracetamol-induced AKI.

**Material and methods.** The experiments were conducted on mature white rats weighing 150-200 g, and randomly distributed into three groups (n=7). Group I – control; group II – paracetamol-induced AKI (administration of paracetamol at a dose of 750 mg/kg); group III – administration of melatonin at a dose of 5 mg/kg against the background of AKI development. Animals were withdrawn from the experiment 24 h later, while blood, urine and kidneys were sampled for biochemical and histopathological assessments. Statistical processing of the obtained data was performed using the SPSS Statistics 17.0 software.

**Results.** In the experiment, a single administration of the toxic paracetamol dose to rats (group II) resulted in drug excessive accumulation and damage to the proximal tubular cells. It is known, that cellular toxicity of paracetamol is associated with translocation and dysfunction of Na<sup>+</sup>-K<sup>+</sup>-ATPase, which ensures effective sodium reabsorption. In rats with paracetamol-induced AKI a decrease in sodium reabsorption and, accordingly, an increase in fractional sodium excretion was found. An increase in the sodium concentration in the tubular fluid led to the activation of tubuloglomerular feedback with a 2-fold decrease in GFR, reduced urine output, and development of retention azotemia. Significant proteinuria compared to the control confirms the severe toxic damage to renal tubular cells. In animals that received melatonin, treatment (group III) renal dysfunction was less pronounced. Melatonin counteracted the nephrotoxic effect of paracetamol, as evidenced by the prevention of significant sodium loss due to maintenance of the reabsorption capacity of tubular cells, restoration of urine output due to maintenance of GFR, and prevention of retention azotemia and significant proteinuria. Paracetamol overdose induced the oxidative stress from the intensification of ROS production, lipid and protein peroxidation processes and the simultaneous decline of the enzymatic antioxidant capacity. In animals from group II, a significant increase in the level of lipid peroxidation end-product malondialdehyde and protein oxidative modification products was found in kidney tissue. Paracetamol also compromised local antioxidant system, manifested in a decrease in glutathione peroxidase and catalase activity. Melatonin showed a significant antioxidant effect manifested in attenuation of both lipid and protein peroxidation in the kidney tissue, along with an increase in the glutathione peroxidase and catalase activity.

**Conclusions.** The obtained results show the ability of melatonin to reduce the severity of damage and prevent kidney dysfunction associated with paracetamol overdose. Treatment with melatonin inhibited the progression of oxidative stress in kidney tissue through the limitation of lipid and protein peroxidation and activation of the key antioxidant enzymes. Results of research