

**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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inflammatory reactions in the lungs, inhibiting the expression of pro-inflammatory mediators (IL-1 $\alpha$ , IL-1 $\beta$ , TNF- $\alpha$ ) and stimulating the phagocytic ability of macrophages. A meta-analysis of randomized controlled trials on the use of vitamin D supplements found them to be safe and effective in reducing the risk of developing acute respiratory disease. The protective properties were associated with the consumption of a daily dose of 400-1000 IU of vitamin D for 12 months.

Vitamin C acts as a stimulator of leukocyte functions, in particular the movement of neutrophils and monocytes, enhances chemotaxis and phagocytosis, counteracts the increase in TNF- $\alpha$  and increases the level of the anti-inflammatory cytokine IL-10. Vitamin C supplements have also been shown to reduce the duration and severity of upper respiratory tract infections, such as the common cold, especially in people who are physically active. For preventive purposes, risk groups are recommended to consume vitamin C in a daily dose of 500-1000 mg.

Zinc participates in the regulation of the inflammatory response, affecting the activity of leukocytes and lymphocytes, including their proliferation, differentiation and maturation, is a cofactor of thymulin, regulates the activity of mature T cells in the peripheral blood and stimulates their maturation, suppresses the production of pro-inflammatory cytokines (IL-1 $\beta$ ), acts as a signaling molecule in the production of IL-2,  $\gamma$ -interferon and IL-12, which stimulate CD8<sup>+</sup> T cells. This trace element affects the activation of mucociliary clearance by increasing the frequency of movement of cilia in the respiratory tract, preventing the penetration of viruses into cells. In the long term, a zinc intake of no more than 25-50 mg/day is recommended, as the intake of high doses of zinc can disrupt the copper balance.

Selenium inhibits the protein disulfide isomerase enzyme, which is responsible for joining the viral glycoprotein, preventing the virus from entering the host cell. It thus reduces the level of IL-1 $\beta$  and IL-6. Selenium supplementation of 100 mcg/day has been shown to improve various indicators of immunological reactivity.

**Conclusions.** Adequate correction of the diet, competent supplementation of it with individual nutrients can favorably stimulate the immune response of healthy individuals and individuals with an increased risk of developing viral infections.

**Kmet T.I.**

## **EARLY AND DELAYED RESPONSE OF BCL-2<sup>+</sup> PARIETAL CORTICAL CELLS OF RATS WITH EXPERIMENTAL DIABETES TO ISCHEMIA-REPERFUSION**

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**Introduction.** The rapid growth of cerebrovascular pathology, its prevalence and serious consequences attract the attention of many scientists. Special attention is paid to the study of ischemic lesions of the brain, which account for more than 2/3 of all cerebrovascular diseases. The list of diseases against which brain ischemia develops more often includes diabetes mellitus (DM), which increases the risk of developing ischemic lesions of the neocortex, creates a high probability of energy imbalance of nerve and glial cells and ultimately leads to their death. However, from the available scientific literature, it is not known about the state of antiapoptotic processes in the neocortex of rats with DM complicated by bilateral carotid ischemia-reperfusion in the early and remote postischemic periods.

**The aim of the study.** To investigate the effect of carotid ischemia with reperfusion of different durations on the early and delayed responses of the anti-apoptotic protein Bcl-2<sup>+</sup> in cortical cells of the parietal lobe of the hemispheres in rats with streptozotocin-induced diabetes.

**Material and methods.** Experimental studies were conducted on two-month-old male rats, which were modeled with diabetes by a single intraperitoneal injection of streptozotocin (Sigma, USA) at a dose of 60 mg/kg of body weight. At the age of 5 months, some rats, as well as control animals of the same age, underwent bilateral compression of the common carotid arteries for 20 minutes under calypsol anesthesia (75 mg/kg). One group of rats was removed from the experiment

after 1 hour, the other – on the 12<sup>th</sup> day of the post-ischemic period by decapitation under anesthesia. The Bcl-2 protein content in nerve and glial cells was determined by the immunocytofluorescence method. The statistical significance of the differences was assessed by the t-Student's test for independent samples.

**Results.** According to the results of experimental studies, it was established that after a 20-minute ischemia with one-hour reperfusion in the cells of the parietal lobe, a decrease in the total number of Bcl-2<sup>+</sup> cells by 1.2 times and the density of Bcl-2<sup>+</sup> neurocytes by 1.3 times was observed. On the 12<sup>th</sup> day of the ischemia-reperfusion period, a significant decrease in the total number of Bcl-2<sup>+</sup> cells and Bcl-2<sup>+</sup> neurocytes was maintained by 1.3 and 1.4 times, respectively. In addition, during this period, a decrease in the density of gliocytes by 1.2 times relative to the control. Modeling of DM increased the total density of Bcl-2<sup>+</sup> cells by 1.2 times and Bcl-2<sup>+</sup> neurons by 1.5 times compared to the control group of animals and did not affect the density of Bcl-2<sup>+</sup> gliocytes.

**Conclusions.** Thus, by studying the role of antiapoptotic proteins in neurological diseases with impaired energy metabolism, in particular carbohydrate metabolism, we can enhance the understanding of the mechanisms of brain neuroplasticity.

**Kushnir O.V.**

## **FEATURES OF MICRONUTRIENT CONSUMPTION BY STUDENT YOUTH FOR THE PREVENTION OF RESPIRATORY DISEASES**

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**Introduction.** An important aspect of the respiratory diseases prevention is sufficient provision of the body with vitamins and minerals. However, in today's realities, it is not always possible to provide the body with the necessary amount of micronutrients due to their insufficient content in food products during the cold season, as well as due to a violation of the nutritional regime and its balance.

**The aim of the study.** To analyze the peculiarities of micronutrients' use by student youth in order to prevent respiratory diseases.

**Material and methods.** An anonymous survey was analyzed, in which 100 Ukrainian students of the 2nd and 3rd courses of the "Medicine" specialty of the Bukovinian State Medical University voluntarily participated.

**Results.** The results of the survey showed that 38% of respondents use medicines and/or dietary supplements containing micronutrients for the prevention of respiratory diseases, 54% – in the event of the first symptoms of the disease, and only 8% – do not use them, preferring their natural sources. Among the interviewees who used medicinal drugs and/or dietary supplements for preventive purposes, 32% chose monopreparations of specific vitamins or minerals, 68% preferred vitamin-mineral complexes. 38% of respondents took the appropriate medicines or dietary supplements on the advice of their family doctor, 32% on the advice of friends or bloggers on social networks, 18% on the advice of university teachers, and 12% on the advice of their parents.

Most often, the interviewees consumed vitamins C and D (78% and 42%, respectively), somewhat less often - the minerals zinc (33%) and selenium (12%). Among the respondents who consumed medicines and/or dietary supplements of vitamin C for preventive purposes, 35% took them in a daily dose of less than 500 mg/day, 53% – 500 mg/day, 12% – 1000 mg/day and more. Among vitamin D preparations, 55% of respondents preferred a dosage of 2000 IU per day, 40% – 1000 IU and less, 5% – 4000 IU and more.

Among food sources of vitamin C, 55% of respondents preferred citrus fruits, 20% preferred other fruits and berries (apples, rose hips, cranberries, etc.), 25% preferred seasonal vegetables (sauerkraut, onions). Among the main sources of vitamin D, 46% of students used dairy products, 32% – chicken eggs, and 22% – fish. Also, according to the results of the questionnaire (questions without answer options), it was possible to find out that the respondents are not sufficiently aware of which food products are the main sources of zinc (52%) and selenium (64%), what are the