

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



## **МАТЕРІАЛИ**

**104-ї підсумкової науково-практичної конференції  
з міжнародною участю  
професорсько-викладацького персоналу  
БУКОВИНСЬКОГО ДЕРЖАВНОГО МЕДИЧНОГО УНІВЕРСИТЕТУ  
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**Conclusions.** A period of exercise with body weight loss and reduction of body mass index can contribute to the decline of testosterone concentration, decrease of luteinizing hormone/follicle-stimulating hormone ratio, improvement of metabolic condition. It prevents from the increasing of prolactin and hyperandrogenism side effects.

**Olenovych O.A.**

**PECULIARITIES OF RENAL MECHANISMS OF CARBOHYDRATE STATUS  
REGULATION IN THE EARLY PERIOD OF EXPERIMENTAL DIABETES WITH  
UNDERLYING PHARMACOLOGICAL BLOCKADE OF RENIN-ANGIOTENSIN-  
ALDOSTERONE SYSTEM**

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**Introduction.** Based on the pathophysiology of renin-angiotensin-aldosterone system (RAAS), its multifactorial influence on the renal functions obviously requires a detailed study at different stages of nephropathy progression in order to identify pathological factors that are directly promoted by RAAS, and the processes that are hemodynamic consequences of its influence. Specific attention is attracted to the investigation of RAAS involvement in the regulation of renal mechanisms of glucose transport in case of diabetic kidney.

**The aim of the study.** To explore peculiarities of renal mechanisms of carbohydrate status regulation in the early period of alloxan-induced experimental diabetes mellitus (EDM) with underlying pharmacological blockade of RAAS.

**Material and methods.** The experiments were carried out on 16 white non-linear mature male rats with alloxan-induced EDM; 10 intact animals served as a control group. On 11<sup>th</sup> day after the induction of EDM kaptopril was administered intraperitoneally to 8 diabetic rats for the pharmacological blockade of RAAS, all the rats were withdrawn from the experiment. The concentration of glucose in the blood plasma and urine, its excretion, filtration load, reabsorption, clearance, tubular transport were studied under conditions of water 2-hour diuresis.

**Results.** On the 11<sup>th</sup> day of the experiment, after pharmacological blockade of the intrarenal RAAS, typical diabetic changes in the carbohydrate status persisted in the experimental animals: alloxan-induced hyperglycemia reached the level 2,9 times higher than the control one, 1,4 time succeeding the rate of rats with 11-day EDM without kaptopril administration. The level of glucosuria after kaptopril administration was found to be significantly higher as well (by 1,7 times) than the corresponding parameter of diabetic rats without pharmacological blockade of RAAS, and the excretion of glucose raised by 2,5 times, including the one standardized in volume of glomerular filtrate (1,7 times). The filtration charge of glucose in alloxan-diabetic rats under kaptopril action exceeded the control level by 6,3 times and was found to be twice higher than the corresponding index of alloxan-diabetic rats without RAAS blockade, consequently causing an intensification of the absolute proximal tubular transport of glucose (by 5,9 times as compared to the group of intact animals and by 2 times – to the group of diabetic rats without RAAS blockade). A significant decline in the relative glucose reabsorption (by 6,8% in comparison with the level control group, as well as by 1,9% – with the corresponding index of diabetic rats without RAAS blockade) was probably caused by the overload of the proximal tubule by filtrated glucose. Glucose clearance under the condition of pharmacological blockade of RAAS was 64 times higher than that of the control and by 1,9 times exceeded its level in alloxan-diabetic rats without RAAS blockade. The concentration index of glucose in alloxan-diabetic rats after kaptopril administration was 36,1 times higher than the corresponding parameter of intact animals and 1,3 times higher than that of alloxan-diabetic rats without RAAS blockade.

**Conclusions.** The intensification of renal glucose transport during 11-day experimental diabetes mellitus with underlying pharmacological blockade of renin-angiotensin-aldosterone system is stipulated not only by hyperglycemia and «above-threshold» glucose in the ultrafiltrate, but also by an intensification of the hyperfiltration phenomenon and, as a result, the functional inability of the proximal tubules to adequate glucose reabsorption. The further influence of

hyperfiltration can be causative of the development of tubulopathies, that emphasizes the renoprotective effect of the renin-angiotensin-aldosterone system on the functional state of the kidneys in the early stages of the development of experimental diabetes mellitus.

**Pankiv I.V.**

## **INTERRELATION BETWEEN VITAMIN D STATUS AND THE BODY MASS INDEX IN PATIENTS WITH TYPE 2 DIABETES**

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**Introduction.** Relationship between serum levels of vitamin D and overweight and obesity in both population-based and clinical studies with different designs shows the importance of this vitamin in the causal network of obesity. Obesity and overweight are major risk factors for hypertension, leading to many other chronic diseases such as coronovascular disease and stroke.

**The aim of the study.** To investigate vitamin D status in patients with type 2 diabetes mellitus (DM) and to establish the association between serum 25(OH)D level and body mass index (BMI).

**Material and methods.** For this observational study, data were collected during summer 2021, over a period of one week from different areas in Chernivtsi region from 216 type 2 diabetic patients aged 36–79 years. Measured variables contained 25(OH)D level, weight and weight applied to check BMI degree. The average level of vitamin D among adolescents presented  $21,2 \pm 6,4$  ng/ml. Female gender was associated with lower vitamin D concentrations ( $19,3 \pm 5,9$  ng/ml vs.  $24,1 \pm 7,1$  ng/ml for men). Among the participants, 74,3% had a BMI of  $25 \text{ kg/m}^2$  and over, and in 26,9% of them the number was  $30 \text{ kg/m}^2$  and over.

**Results.** High frequency of overweight and obesity was detected in observed participants. 83,3% individuals were overweight and obese in accordance to BMI, especially women. Violation of vitamin D status was detected in 88,1% people. 2,1% people had been identified to have severe vitamin D deficiency. Measurement of 25(OH)D demonstrated significant relationship between vitamin D level and BMI only among people with overweight (BMI  $25\text{-}29,9 \text{ kg/m}^2$ ). The average vitamin D concentrations in people with BMI over  $30 \text{ kg/m}^2$  did not vary to a significant range from data in people with normal body weight. There were significant inverse correlations between serum 25(OH)D concentrations and body fat mass ( $r=-0,317$ ,  $P=0,001$ ), and parathyroid hormone (PTH) concentrations ( $r=-0,314$ ,  $P=0,003$ ). A significant positive correlation was observed between changes in serum PTH concentrations and body fat mass ( $r=0,34$ ,  $P=0,002$ ), while there were no significant correlations between serum 25(OH)D concentrations and body fat mass or PTH concentrations.

**Conclusions.** Our results confirm reliable relationship between vitamin D level and body mass index among type 2 diabetic patients with obesity and overweight.

**Pashkovska N.V.**

## **PECULIARITIES OF THE CARBOHYDRATE METABOLISM IN PATIENTS WITH LATENT AUTOIMMUNE DIABETES IN ADULTS DEPENDING ON THE LEVEL OF AUTOIMMUNITY**

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**Introduction.** The presence of specific autoantibodies is the basis for differential diagnosis and prediction of type 1 diabetes mellitus (T1DM), which since 2021 includes latent autoimmune diabetes in adults (LADA), as well as predicting its occurrence in people at increased risk of the disease to detect it in the preclinical period. It is believed that autoantibodies appear 7 or more years before the onset of the diabetes (DM) and are detected in the onset of T1DM with a frequency of 50 to 90%, as opposed to 1% in the general population. Moreover, the titer of these antibodies determines the course of the disease and helps to choose the right treatment tactics.