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**THE IMMUNE PROTECTION CONDITION IN DIABETES MELLITUS PATIENTS  
WITH PYOINFLAMMATORY PROCESSES**

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The immune system disorders in diabetic patients lead to a significant decrease in non-specific and specific immune anti-infectious defense by inhibiting phagocytic function of polymorphonuclear leukocytes, lowering of the compliment system activity, lyzocim, interferons, bactericide activity of the blood serum.

We used the next materials and methods: diabetic patients with pyo-inflammatory processes treated by traditional methods (n = 40); diabetic patients with pyo-inflammatory processes treated by ozonotherapy along with traditional treatment (n=53).

The obtained results confirm changes in the absolute and relative number of immune cells in the peripheral blood of DM patients associated with pyoinflammatory processes. A relative number of lymphocytes decreases in these patients, at the same time a tendency to growth in the absolute number of the total pool of lymphocytes is formed.

The research of the immune disorders degree confirmed that therapeutic measures, including ozonotherapy, in case of pyoinflammatory processes in patients with DM show their effectiveness. On admission 65,0% of patients were diagnosed with the I-II degree of immune disorders, which required immunorehabilitation; after pyoinflammatory processes therapy only 55,0% of diabetic patients were left. Special efficiency is shown in the stage III of immune disorders.

Pyoinflammatory processes in patients with diabetes occur against a background of a decrease in the appropriate number of lymphocytes; increase in the absolute and relative number of monocytes, the absolute number of leukocytes due to the increase in the relative amount of neutrophilic polymorphonuclear leukocytes, as well as a decrease in the absolute number of eosinophils, erythrocytes and hemoglobin.

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**COMPLEX ALGORITHM FOR DIAGNOSTICS OF CHOLELITIASIS IN PATIENTS  
WITH CHRONIC CHOLECYSTITIS AND DIABETES MELLITUS TYPE 2**

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Some separate data are usually not sufficient for improvement of early diagnostics of cholelithiasis in patients with chronic non-calculouscholecystitis combined with diabetes mellitus type 2. In this case it is necessary to use a systematic approach both in diagnostics and in correction of the detected changes.

Pathophysiology of the formation of gallstones includes 3 stages: saturation, crystallization and growth. The most unstable phase is the liquid crystals phase, when the transition to both the micellar phase and the phase of true microcrystals is possible. The lability of the physico-chemical processes occurring in the gallbladder can be used to correct the solubilization of cholesterol in bile. Therefore, as the quantitative parameter, we have chosen the crystallization factor, the value of which was determined by the ratio of the total area of the centers of crystallization to the total area of the laser image of the bile sample. This allowed us to identify pathological mechanisms at the level of the liquid crystals phase, when traditional lithogenicity indexes remain "mute". In fact, this necessitates the need for comprehensive diagnosis of the bile homeostasis disorders in these categories of patients.

It was established that in patients with chronic non-calculouscholecystitis and diabetes mellitus type 2 the main role in lithogenesis was played by the disorder of regulation of the level of cholesterol. Usually there are disorders of other parts of the lipid metabolism in patients, but the leading place belongs to the cholesterol. In patients with chronic non-calculouscholecystitis, major



disorders occur due to high-density lipoproteins, which are counter-factors of atherogenicity and stone formation.

Noteworthy is the fact that diseases of the biliary system are poorly symptomatic in patients with diabetes mellitus, which is associated with the presence of diabetic autonomic neuropathy. In this category of patients quite often it is impossible to prevent the processes of lithogenesis, and it is necessary to treat already formed stones medicamentally and surgically. Surgery is a very powerful stress for patients with diabetes mellitus that can lead to decompensation of major body systems, so early diagnosis of gallstone formation and its prevention is necessary in this category of patients.

Considering the peculiarities in lipid metabolism changes in patients with combined pathology, it is necessary to carry out the multi-moment duodenal probe with the next evaluation of vesicular bile portion with further biochemical investigation in the following categories of patients. When evaluating the results of a biochemical investigation of bile, all changes should be taken into consideration, as separate data are not efficient in objective estimation. In this case, lithogenicity indices should be used: ratios such as bile acids / cholesterol and phospholipids / cholesterol. They are reliable for confirming the link should be influenced both for preventive and curative purposes. Isaxon index should be also used to determine the lithogenicity of bile. This index is a three-component system that more accurately indicates the increased lithogenic properties of bile. It should be obligatory for some bile samples carrying out laser polarimetry with next complying of polarization-correlation maps and selections and calculation of the crystallization coefficient.

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#### **PECULIARITIES OF ACID-REGULATING RENAL FUNCTION DISORDERS IN THE EARLY PERIOD OF ALLOXAN-INDUCED EXPERIMENTAL DIABETES**

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Diabetic kidney disease is one of the most severe complications of diabetes mellitus, which dramatically decreases the quality and duration of life of diabetic patients. This is a clinical diagnosis historically based, primarily, on the detection of proteinuria in diabetic patients, confirming a long existence of kidney damage with already practically irreversible changes at glomerular level. Meanwhile, acid-regulating renal function is known as one of the most sensitive indicators of the functional state of the nephron. Considering that, the objectives of this research was to study the condition of active acid-regulating renal activity in the early period of experimental diabetes mellitus (DM).

The experiments were carried out on 20 matured nonlinear male rats, weighted 0,1-0,2 kg, under the standard conditions of vivarium. For the experimental modeling of DM 10 animals were administered alloxan intraperitoneally in a diabetogenic dose of 160 mg/kg; 10 animals served as a control group. On 11<sup>th</sup> day after the administration of diabetogenic substance all the experimental animals were withdrawn from the experiment. With the purpose to study the function kidney state, the animals were loaded with water in the volume of 5% of body weight, placed into individual cages for 2 hours to collect urine samples. Further analysis of urine samples, as well as blood plasma, collected at the moment of decapitation of animals, enabled the evaluation of acid-regulating renal function (urine pH, titrated acids, hydrogen ions and ammonia levels were detected).

As the results of investigation demonstrated, blood glucose concentration in rats with 11-day-long alloxan-induced diabetes significantly exceeded the value of the appropriate index in the control group rats by 2,2 times ( $P < 0,001$ ), expectedly followed by the development of glucosuria, that evidences the adequacy of the used experimental model.

On the 11<sup>th</sup> day of the alloxan-induced hyperglycemia an active release of titrated acids and ammonia compounds in diabetic rats exceeded the control values 40,3% and 12,3% (respectively). At the same time, the excretion of ammonia, standardized in volume of glomerular filtrate, was reliably lowered (21,3%,  $P < 0,001$ ) as compared to the controls. Ammonia ratio demonstrated a