

УДК 616. 379-008.64-085.835.14

THE ANALYSIS PARAMETERS OF THE IMMUNE RESPONSE IN DIABETIC PATIENTS WITH PYOINFLAMMATORY PROCESSES.

АНАЛИЗ ПОКАЗАТЕЛЕЙ ИМУННОГО ОТВЕТА У БОЛЬНЫХ САХАРНЫМ ДИАБЕТОМ С ГНОЙНО-ВОСПАЛИТЕЛЬНЫМИ ПРОЦЕССАМИ.

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

Ozone application in a complex treatment of patients with diabetes complicated by pyoinflammatory processes has an apparent therapeutic effect and prevents the development of the relapse and complications of the disease promoting significant improvements of direct and remote results of treatment of the given pathology.

Key words: diabetes mellitus, pyoinflammatory processes, immune system, ozonotherapy.

Резюме. Расстройства функции иммунной системы у больных сахарным диабетом приводит к значительному снижению неспецифической и специфической иммунной противоинойфекционной защиты, за счет угнетения фагоцитарной функции полиморфноядерных лейкоцитов, понижение активности системы комплемента, лизоцима, интерферонов, бактерицидной активности сыворотки крови.

Применение озонотерапии в комплексном лечении больных сахарным диабетом с гнойно-воспалительными процессами, оказывает выраженное лечебное действие и предотвращает развитие рецидива и осложнений заболевания, что способствует значительному улучшению непосредственных и отдаленных результатов лечения данной патологии.

Ключевые слова: сахарный диабет, гнойно-воспалительные процессы, иммунная система, озонотерапия.

Introduction. Diabetes mellitus (DM) is characterized by the glucose tolerance impairment and is accompanied by not only well-defined clinical but also immune disorders [3, 4, 6]. Changes in cellular and humoral immune response, formation of autoimmune reactions take an important place in the pathogenesis of the disease [1, 2, 5]. Scientific data analysis shows a steady increase in the number of patients with diabetes, and in developed countries reaches more than 6% of the population [2, 5].

From the surgical point of view, topicality of this problem is first of all stipulated by the fact that purulent-necrotic processes develop in more than 30-70% diabetic patients and 50% of hospitalized patients need surgical care concerning these complications [1, 3, 4].

With regard of to the mentioned facts, it becomes evident that the effective methods of complex treatment of purulent processes in diabetic patients should be searched in order to introduce into clinical practice the effective methods of conservative treatment and new ways of reparative processes activation. For this purpose ozonotherapy has recently become widely used.

Objective of the research is to determine factors and mechanisms of non-specific and specific immune antiinfectious protection in diabetic

patients with pyoinflammatory processes.

Materials and methods: diabetic patients with pyoinflammatory processes treated by traditional methods (n=40); diabetic patients with pyoinflammatory processes treated by ozonotherapy along with traditional treatment (n=53), practically healthy people (n=20); clinical and immunological studies and statistical analysis of data have been performed.

Discussion of results. 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 tendency to growth in the absolute number is considered to be a compensatory increase of the leading immunocompetent cells – the central figure of the immune response to an antigen. The relative amount of eosinophilic leukocytes decreases and a declining tendency in the absolute number of erythrocytes and hemoglobin is formed.

Against this background, in diabetic patients with pyoinflammatory processes the absolute number of monocytes (macrophages), the total

pool of leukocytes increases due to the increase in the relative number of neutrophilic leukocytes. Erythrocyte sedimentation rate – 4,83 times, which confirms the inflammatory process, the relative number of polymorphonuclear leukocytes increases by 24,4%, stabnuclear – 2,2 times, and segmented by 18,8%. The research of the immune disorders degree confirmed that therapeutic measures, including ozonotherapy, against 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 III stage of immune disorders.

ness of these measures. At admission in 65,0% of patients scripting II-III degree of immune disorders requiring mandatory immunorehabilitation and the therapy of inflammatory processes in patients with diabetes, there are only 55.0%. Particular efficiency is shown in the third degree of immune disorders.

Conclusions:

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

Table 1.
Absolute and relative number of immune cells in the peripheral blood of diabetic patients with inflammatory processes

Indexes	Units Measurement	The control group		healthy people (n=20) (M ± m)	P
		quantitative and relative Indexes (M ± m)	the degree of immune disorders		
Lymphocytes					
- absolute number	x10 ⁹ /l	1,72±0,18	I	1,34±0,11	>0,05
relative number	%	18,55±2,57	II	28,80±3,08	<0,05
Monocytes					
- absolute number	x10 ⁹ /l	0,40±0,03	III	0,19±0,09	<0,05
- relative number	%	4,30±1,20	I	4,00±0,49	>0,05
leukocytes	x10 ⁹ /l	9,25±1,43	III	4,70±0,39	<0,05
neutrophilic leukocytes	%	77,10±1,19	I	62,00±0,97	<0,001
- stabnuclear	%	7,60±1,12	III	3,50±0,96	<0,05
- segmented	%	69,50±2,61	I	58,50±5,43	>0,05
Eosinophilic leukocytes	%	1,15±0,12	II	1,80±0,24	<0,05
erythrocytes	x10 ¹² /l	3,92±0,24	I	4,00±0,10	>0,05
Hemoglobin	g/l	120,05±7,6	I	128,00±5,04	>0,05
Color indicator	con.u	0,89±0,03	I	0,80±0,02	<0,05
erythrocyte sedimentation rate	mm/t	40,10±6,22	III	8,30±2,37	<0,01

Obtained are shown in the results of the study of absolute and relative number of immune cells in the peripheral blood of diabetic patients with inflammatory processes increases the absolute number of lymphocytes, monocytes, leukocytes - due to the growth of the relative amount of neutrophilic polymorphonuclear leukocytes and increased erythrocyte sedimentation rate in 3, 6 times. However, the downward trend shows the relative number of lymphocytes, monocytes, eosinophils, erythrocytes, hemoglobin.

The results of the study showed levels of immune disorders that developed a set of remedial measures, including ozone therapy, chronic inflammatory processes in patients with diabetes show the effective-

ness of these measures. At admission in 65,0% of patients scripting II-III degree of immune disorders requiring mandatory immunorehabilitation and the therapy of inflammatory processes in patients with diabetes, there are only 55.0%. Particular efficiency is shown in the third degree of immune disorders.

2. Pyoinflammatory processes in diabetic patients lead to multidirectional action on the absolute and relative number of essential immunocompetent cells. This increases the absolute number of the central figures of immunity and there relative number decreases; the absolute number of leucocytes increases due to the increase in the relative number of stabnuclear and segmented polymorphonuclear leucocytes.

3. The use of ozone in pyoinflammatory processes therapy in patients with diabetes mellitus improves the absolute and relative number of leading immune cells, but impairs erythrocyte sedimentation rate, confirming the continuing inflammatory process.

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УДК 37.091.3.043.2:617

METHODS IMPROVING OF PRACTICAL EXERCISES WITH FOREIGN STUDENTS

УЛУЧШЕНИЕ МЕТОДИКИ ПРАКТИЧЕСКОЙ ПОДГОТОВКИ ИНОСТРАННЫХ СТУДЕНТОВ

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Abstract. Along with testing students at practical classes in surgical disciplines other types of work may be used: discussion of a surgical problem, assertion, persisting students' own opinion, discussions with the teacher, working out and practical skills acquisition; all these measures significantly improve the thematic material acquisition.

Key words: methods improving, teaching, foreign students.

Резюме. Именно применение на практических занятиях по хирургических дисциплинах, одновременно с тестированием студентов, обсуждение хирургической проблемы, доказательства, аргументации собственного мнения, дискуссии с преподавателем, отработки и усвоения практических навыков значительно улучшает усвоение тематического материала.

Ключевые слова: методика, преподавание, иностранные студенты.

Introduction. The active reformation of education, including higher medical education, is still in progress in Ukraine [1, 2, 5]. Current development of medical education in Ukraine, stages of its reformation, issues related to improving the quality of education of medical gradu-