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SOCIETY AS AN ESSENTIAL ENVIRONMENTAL FACTOR (REVIEW)

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Abstract. The impact of environmental factors on humanity is considered as a world-wide challenge which requires to be addressed. The population that has greatly expanded its influence over the last century forms social component of environment. It includes such aspects as economic status of a region and of a particular person, education, level of stress, early life, living conditions, social support, nutrition, transport as well as health care system. All the concerns mentioned above and their effects on human health are actively being studied by various national and international organizations. It has been established that the categories of population of low socio-economic status and low level of social integration are affected much greater than those who are socially adapted. It is worth noting that social adaptation varies in countries with different level of economic development. Consequently, the state of health depends on social and economic situation of people. Perspective directions of social environment study are dedicated to identify the level of susceptibility of an individual to social influences. Worldwide entities aim to monitor the impact of social and psychological environment of different age categories, determine the long-term effect of such an impact. Thus, the forces of health protection organizations direct their forces towards improving health equally for all categories of population. Lack of awareness of all social influences on human health promotes further investigation in this field dedicated to elimination of inequalities of health maintenance.

Keywords: society, social environment, socio-economic status, social influence, human health, social diseases, environment.

Introduction. Nowadays the term "environment" is widely used within most of branches of human activity. The environment as well as its impact on people is largely discussed throughout the world on television and on the Internet. Global negotiations dedicated to environmental problems and their resolution are carried out by worldwide organizations [3, 9, 11]. The environmental issues in countries with poor economic development deserve special attention and often remain significant. Over the last century, the relationship between the environment, social organization and culture has been discussed in such areas as sociology, anthropology, geography and economics [3]. Thus the importance of the environment as a fundamental factor affecting human activity is vigorously growing.

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The term "environment" is derived from French "Environ", which means the immediate environment [9]. The environment includes abiotic (physical - hydrosphere, atmosphere, lithosphere) and biotic (living – biosphere) components. The anthroposphere (social factor) is the third key component of the environment. The environment and organisms are two dynamic complex components of nature [8]. The environment affects the life of organisms, including humans. People, in turn, affect the environment even more significantly than other living creatures. The components mentioned above represent the conditions that surround a person at a particular point in time and space. It should be noticed that the components of the environment are explored at a different level. In fact, the physical, chemical and biological components are much more accessible for exploration than the social aspect [11]. Being a relatively young component, the social environment is a special ecosystem that includes the relationship of a person with a person.

Relevance. The social environment develops and spreads as the population grows. In other

words, humanity itself creates such a component of the environment, expanding its area of influence the day after day. The social environment reflects the traditions in which the person grew up and lives, and the society that the person interacts with. The social component involves economic, natural, human resources that affect the behavior of each individual [2]. The struggle for human existence has become social. The person is incessantly exposed to the social influence, which undoubtedly affects their health and often leads to the depletion of body resources [2, 3]. Modern society is known to be divided into social classes, primarily according to the economic status of the population. Such stratification is clearly noticed when comparing more developed countries with less developed ones, as well as categories of the population of varying level of well-being within the same area [4].

The social environment is considered as an environmental factor that is difficult to be materially introduced and studied as physical process. It is not possible to distinguish the borders of the social component, therefore, the limits of its influence. Thus, aspects of the impact of society on human health are of significantly important nowadays. Health problems do not arise as insulated phenomenon, but are the result of a complex interaction between spatial and temporal circumstances [2].

Society is known to be the most vulnerable environmental factor. In addition, the social environment is extremely dynamic and may have a comprehensive impact on a person and consequently on their health [4, 7]. Thus, all aspects of society as well as their role in the development of various pathological health conditions should be carefully studied in order to promote the prevention of diseases.

Aspects and components of society. The term "society" covers the immediate environment of a person, their relationship with various communities. The social environment includes industrial and professional infrastructure, the labor market, socio-economic processes, human well-being maintenance, social and medical services as well as executive responsibilities. Social influences also depend on racial and national relations, class inequalities, culture, religion and morality. The historical aspect should also be taken into consideration as the impact of society greatly changes throughout centuries. The social environment could be regarded according to several projections, including the household, related networks, the infrastructure of districts, cities and regions [3].

Socio-environmental aspects of human health could be grouped into three categories: environmental epidemiology, social epidemiology and environmental psychology. It is worth noting that these areas are not only insufficiently studied, but also are at a very low level of integration [3, 4]. Social epidemiology is considered as an issue of particular interest. Such an area is one of the most promising areas within the study of environmental factors that affect human health. In fact, society is an elementary unit of social epidemiology. A thorough study of social influence provides new benchmarks for environmental health policies implementing.

Within the study of the impact on human health society includes several components – so-called "social determinants" of health. The World Health Organization (WHO) decipheres the social determinants of health as "the circumstances and conditions in which people are born, grow up, live, work, age, as well as measures taken to combat the disease" [12]. These conditions, in turn, are formed and developed under the control of the economy, the public and politics.

Each component of a person's social environment in terms of impact on human health is considered below.

1. **Socio-economic state** has the greatest impact on disease development as well as distribution within the population. Social class, gender, ethnicity, profession and income play a certain role in this regard. Low incomes closely correlate to bad health. People of poor socio-economic status (as an indicator of low income) are more susceptible to acute and chronic diseases. In addition, lack of money contributes to alcoholism, drug addiction, and smoking, which aggravate health problems.

Statistical data collected by the Kansas Department of Health (USA) show that the incidence of diabetes within a category of people whose income is more than \$50 000 per year reaches in average 5.9%. In contrast, among people who earn less than \$15 000, 16.5% has diabetes [4, 10]. What is more, 36.5% of people with income below \$15 000 is noted to be active smokers, while the population whose income is more than \$50 000, the prevalence of smoking constitutes no more than 10% [4]. As a result, the last category of the population is expected to be less prone to arthritis, coronary heart disease and stroke.

Health condition is also affected by employment status. Unemployed people have worse state of physical and mental health than

the employed ones. The most common pathological condition among the unemployed population (aged from 18 to 45 years) is known to be diabetes (about 25%). Among people having a permanent job, diabetes occurs in 4% of cases. The prevalence of smoking among the working population is noticed to be two times higher than among those without a job [2].

The pattern of work also matters the incidence of diseases. According to statistical data of 2014–2016 yy. gathered in the United Kingdom of Great Britain and Ireland, the average life expectancy for people engaged in intellectual work numbers 83 and 78 years old for women and men, respectively. People of manual professions live in average 74 years (women) and 70 years (men) [2, 3].

2. **Education** also plays an important role in the state of health. Education is supposed to be a measure of socio-economic status and consequently a predictor of health. Scientists of the National Institute of Health (the USA) conducted statistical studies indicating that the lack of education significantly reduces the organism resistance to various diseases. In particular, the group of people of higher grade of education (college or institute) suffers from diabetes in 6% of cases. The prevalence of diabetes among adults who do not have secondary education, estimates at around 14%. In addition, 30% of the uneducated population suffers from alcoholism and smoking. By contrast, only 7.8% of educated people tends to have such habits [3, 13].

3. **The level of stress** is regarded as separate component of the social environment according to the WHO. Social and psychological circumstances could lead to prolonged stress. Anxiety, low self-esteem, social isolation, overstrain at working place and at home increase the prevalence of illnesses and premature death. The close relation between stress and mortality rate is greatly seen when analyzing the social hierarchy of population of industrialized countries [8]. Stressful situations promote the readiness of person's endocrine and nervous systems in order to ensure immediate respond to the emerging threats: the pulse rises, energy reserves are mobilized, blood flow to the muscles increases. The cardiovascular and immune systems are both involved as well. Constant emotional stress depletes the human nervous system, making it more labile [5, 8]. Prolonged stressful state leads to a rise of vulnerability of a person to a number of pathological conditions, such as: infectious diseases, diabetes, hypertension, coronary heart

disease, stroke and depression. According to the British Medical Journal (the United Kingdom of Great Britain), the incidence of cardiovascular diseases is 7 times higher in those people who are full-time workers in comparison with those are part-time busy [4].

4. **Early initiation of independent life** is also a factor that has a significant impact on the health of a person and their children [2]. The health of an adult is known to be laid from birth. Fetal development is an extremely important period within lifetime of an individual. The lack of woman nutrition during pregnancy, stress, severe course of pregnancy, associated with the psychological unpreparedness of the future mother to take care for a child and be responsible for it, leave an imprint on the health of her posterity. The poor physical health of the infant greatly increases the prevalence of cardiovascular and respiratory disorders, disturbance of pancreas, kidneys functioning which increase the risk of morbidity in adulthood. According to the journal "Mothers, babies and health in later life" (Scotland), children with a birth mass of less than 2.5 kg are affected by diabetes 6 times more frequently than those children whose weight exceeded 4.3 kg [2].

5. **Social conditions.** The quality of housing is the key indicator within this area. Poor living conditions promote critical health problems. Poverty and social exclusion are supposed as harbingers of premature death. Migrants and refugees, homeless people, national and ethnic minorities form separate categories of the population that society does not accept. Undoubtedly, the risk of morbidity significantly increases among such population. Pregnant women, children and the elderly are particularly susceptible. The cardiovascular system suffers in the first place [2, 13]. So-called "social diseases" are also quite frequent. These include: sexually transmitted diseases, tuberculosis, rickets, beriberi, rheumatism. Drunkenness and alcoholism are common as well.

6. **Social support** makes a significant contribution to the state of human health providing humanity with emotional and practical resources and thus promoting a powerful protective effect on the person. Support can be provided both at the individual and public levels. Low social support is often associated with an increased risk of premature death and poor survival after a heart attack. In particular, among those who are not socially secured, mortality after a heart attack reaches almost 50%, while people who receive

adequate social support, have poor prognosis after a heart attack only in 25% of cases [2].

7. **Adequate nutrition** and access to food resources directly correlates with person's health and well-being. Lack of any components of the human diet promotes metabolism slowdown, insufficient nutritional supply and protein-energy deficiency. Excessive consumption of any components leads to such terrible conditions as cardiovascular insufficiency, diabetes, cancer, degenerative diseases of the eye, obesity and caries [2, 7]. The social side of the issue encompasses the possibility of providing the population with healthy food. In particular, 73% of Western Europe population tends to consume mainly saturated fats and simple carbohydrates (fast food). Such food is available for all population categories of different socio-economic status. However, world food trade nowadays does not pay enough attention to the quality of products consumed by society and their impact on the human body. International committees such as Codex Alimentarius (USA), which determine the standards of quality and food safety, are not supported by representatives of public health. Consequently, the long-term consequences of the consumption of low-quality food on human health are not taken into account [6].

Socio-economic conditions lead to differences in the food basket of different categories of the population. In many countries of low development level cheap, energy-intensive products are consumed more often than fresh fruits and vegetables. Such categories of people as young families, the elderly, the unemployed, have the least opportunity to eat well and get all the nutritive substances the body needs. The consumption of fresh vegetables and fruits, legumes, exclusion of starch, animal fat, refined sugars and salt are proved to prevent chronic diseases. According to the United Nations for 2003, the following correlation was traced: the mortality rate from coronary heart disease is inversely proportional to the population supplement with fresh fruits and vegetables in some European and Asian countries. Thus, the highest mortality rate is observed in such countries as Ukraine, Belarus and the Russian Federation, where the supply of fruits and vegetables constitutes less than 150 kg per person per year. The lowest mortality rates are observed in France, Spain and Italy where more than 300 kg of fruits and vegetables are annually produced per person [2, 12, 13].

8. **Transport** is an integral part of the social environment. Transport is closely related to the level of physical activity of a person. Cycling,

walking, public transport usage contributes to the preservation of health. Such ways of transportation provide regular physical activity, reduce fatal accidents as well as reduce air pollution. On the one hand mechanization greatly eased human life but on the other hand led to an obesity epidemic. A sedentary lifestyle, car addiction lead to heart disease, diabetes, respiratory diseases and hypoxia, which are associated with lack of fresh air [2]. In addition, the use of private vehicles leads to social exclusion, which, in turn, significantly reduces the interaction of social groups and society as a whole. Undoubtedly, such a relationship is associated with a progressive deterioration of health. Road traffic significantly pollutes the environment, raises the level of noise, which affects the ecological condition of large cities. It is worth noting that this social aspect primarily affects more economically developed countries [3–5].

9. **Health care system** is another important aspect of society. Access to medical services, including clinical, preventive services and primary health care, determines the ability of society to monitor their own health, both before the onset of the disease and during its progression. Medical services have not been recently considered as a social determinant of health. However, the inequality of access to health care forces worldwide health organizations to change such an ingrained opinion [4]. Social inequality leads to dramatic differences in the attitude of medical representatives to certain groups of the population as well as to the lack of cultural competence, which is provoked by different economic status of patients. Nowadays there is a selective access to medical care, unequal opportunities for maintaining health and ensuring well-being, preventing diseases, providing treatment of the disease and survival in all the countries throughout the world. Prevention, diagnosis and treatment of the disease, the improvement of physical and mental well-being should be provided equally for all individuals, regardless of their social status. Health management must be patient-centered, equally effective and fair. Such important indicators within this area as the availability of health insurance and access to primary medical care are to some extent limited today [8]. The effects mentioned before could be exacerbated by difference in the availability and feasibility of medical services. The economic status of countries and regions is directly related to the development of the health care system. Thus, according to WHO observations, the region of

Africa has significantly lower levels of medical development as well as environmental protection than the European and American ones [1, 2, 5].

Prospects of the social environment study. The concern of the relationship between socioeconomic aspects and health has expanded over the past few decades. The state of health closely correlates to the social status of the individual in most countries of various level of development. Premature mortality, deterioration of health, chronic pathological conditions, disability, and mental health disorders commonly happen to the category of the population with low social status who is more susceptible to the influence of society. In regard to human health, not only individual characteristics of a person, but also his social environment as well as chemical and physical factors should be taken into account [3, 6, 7]. Social support, the health care system, employment opportunities and education, transport infrastructure, food supply have a global impact on the livelihoods of the human body [7].

It should be noted that the socio-economic status and reputation of the person's neighborhood and surrounding area are also of great importance. Social factors should take into account the peculiarities of lifestyle, hard and risky work, marital status, which are fundamental aspects in the life of each individual. Such quality as resistance should also be considered. It encompasses to the ability to work productively and maintain health, despite the prevailing social circumstances. Thus, the issues of different vulnerability of people and the role of psychosocial aspects in this regard remain unclear, since each individual has different adaptive abilities [6].

Social epidemiology research is extremely difficult due to the frequent lack of awareness of all the characteristics that are relevant to health and healthy behavior. Physical and social aspects of the environment are not aggregated enough. Therefore, hygienists should consider all aspects and components in order to assess the situation sufficiently. Such an approach produces a powerful impetus for the development of typologies at the national as well as international levels. For example, the United States Department of Health and Advisory Committee of the Secretariat for National Health Promotion and Disease Prevention (the USA) recommended "to follow a comprehensive approach according to which all government structures direct their forces towards improving health equally for all categories of the population and reducing inequalities in health maintenance "[6, 8].

The WHO is currently developing several tasks and perspective issues in regard to the social context [12]:

- How are social aspects defined and changed?
- How are the environment and its impact on health limited to humanity?
- What is the role of social environment?
- What methods and tools are needed for a comprehensive study of social and environmental characteristics in terms of health?

The WHO Committee on Social Determinants of Health is actively developing forward-looking models for improving interaction between the social environment and humans. These models are aimed to the following tasks:

- to monitor the influence of social and psychological components of the environment on different age categories; to determine the long-term effects of such an impact on the subsequent life of the individual;
- to pay attention on the social protection of a person, which ensures an even balance between the social strata of the population and their successful cooperation;
- to ensure early diagnosis and the provision of competent medical care, regardless of the social status of the person;
- to eliminate all the concerns related to the protection of the social environment gradually;
- to influence all components of society, taking into account the country's economics and the individual's position in society [12, 13].

Conclusions. Therefore, the available data gathered from the conducted studies confirms the impossibility to single out one particular factor that determines the level of influence of the environment on human health. The impact is always made by a few combined factors, both favorable and unfavorable ones. In addition, individuals react to the environmental influence in a different way. Personal social characteristics such as resistance determine the degree according to which the impact is more or less pronounced.

Such areas as environmental epidemiology, environmental psychology and social epidemiology are actively being considered. Significant progress has been recently achieved in social epidemiology exploration. More attention is paid nowadays to the personal development possibilities, well-being maintenance as well as relationships between people and social groups.

However, in regard to social environment new insights and opportunities may contribute to sustainable health only in case if the prospects are united and directed to the uniform purpose.

Environmental hygiene should be based on assessment of complex effect of all factors on an individual. Only in this case the reaction to the emerging stressors could be explained not only in accordance with individual characteristics, but also with social cohesion and social capital strengthening. The contextual approach to environmental protection requires interdisciplinary cooperation, which is achieved by the analysis of relationship between the environment and health, the influence of policies, thematic integration.

It could be rightfully claimed that restructuring of areas such as social life, work, environment, transport, education, social protection, public

health has a profound impact on health. The research and health policy should be greatly coordinated by governmental structures at both local and national levels. Any intervention in the human environment requires considerable time to be prepared and has long-term consequences. Thus it is necessary to have a clear awareness of the future development of the human environment and its interaction with health state. Such an approach will ensure health promotion as well as prevention, treatment of diseases and increase in life expectancy.

Conflict of interests. There is no conflict of interests.

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ASSESSMENT OF CLINICAL PRESENTATION OF ABDOMINAL AORTIC ANEURYSM

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Abstract. To date, vascular disease rank first (more than 50%) among the causes of mortality in Ukraine. Atherosclerotic vascular involvement, being the most frequent etiological factor of abdominal aortic aneurysm, in the absence of timely diagnosis and treatment, causes severe complications, early disability and death. Clinical and functional diversity of abdominal aortic aneurysm causes difficulties in diagnosing, defining different therapeutic approaches, methods of operation and protection of visceral organs and spinal cord. The article analyzes various clinical manifestations of abdominal aortic aneurysms in 264 patients who underwent surgical treatment at the State Facility V.T Zaytsev Institute of General and Urgent Surgery from 2010 to 2018.

Key words: abdominal aortic aneurysm, rupture of abdominal aortic aneurysm.

Introduction. Surgery on the aorta began with operations on its abdominal department. In 1817, A. Cooper first performed ligation of the abdominal aorta due to aneurysm. Surgery on the thoracic aorta originated in 1944, when J. Alexander and F. Byron were the first to perform resection of sac-like aneurysm of the thoracic aorta with suture of wall defects [3, 4, 9]. The first successful operation on the rupture of abdominal aortic aneurysm (AAA) was carried out on 13 March 1953 by Henry Bahnson, which was reported in the same year in the American journal "Annals of Surgery" in the article "Considerations in the excision of aortic aneurysms". This event has become a major milestone in the history of vascular surgery, and especially in the history of surgery on aortic aneurysms. The subsequent progress of aortic surgery is associated with such names as M. DeBakey, D. Cooley (1953), R. Wheat (1964), M. Bentall and A. De Bono (1968), C. Cabrol (1968) p). The complexity of clinical diagnosis of rupture of abdominal aortic aneurysm involves the variety of symptoms described in this pathology. And most of these symptoms can be observed in many acute diseases of the abdominal cavity, renal colic,

gastroduodenal bleeding, in lumbar sacral osteochondrosis [1,8].

2. Purposes, subjects and methods:

2.1. Purpose is to identify the most common clinical manifestations of abdominal aortic aneurysm, based on a long-term experience of treatment of this disorder.

2.2. Subjects & Methods. From 2010 to 2018, 264 patients with abdominal aortic aneurysms were surgically treated at the State Facility V.T Zaytsev Institute of General and Urgent Surgery. Patients were divided by gender, age, and etiology of the disease. All patients were also divided into 4 groups depending on the nature and severity of clinical manifestations.

The main group of patients with abdominal aortic aneurysm comprised patients aged 61 to 70 years (52.6%). One third of the patients were aged over 70 (29.22%). Patients under retirement age amounted to 18.18% of the number of all patients with abdominal aortic aneurysms.

There were predominantly more male individuals (251 patients) among patients with true abdominal aortic aneurysms (AAA), which was 95.07%. Of 13 women with abdominal aortic aneurysms (4.93%) 9 were over the age of 70.

In the vast majority of cases, in 256 patients (96.9%), the etiological factor in the development of AAA was atherosclerosis. Nonspecific aortoarteritis occurred in 3 (1.14%) patients, which was clinically determined and confirmed by morphological studies.

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In the last three years, "inflammatory" aneurysms of the abdominal aorta were also detected in 4 cases (1.52%). A characteristic feature of these aneurysms was an intraoperative morphological picture: most often there was a significant thickening of the wall of the aneurysm and a "layered" structure of the wall, severe adhesion process (fibrosis) surrounding the aneurysmic and retroperitoneal area, densely fused adjacent abdominal organs with the aneurysm and with each other. Histological picture was characterized by severe productive inflammation with nonspecific lymphohistiocytic infiltration and severe, intense fibrosis. In one case, the cause of abdominal aortic aneurysm, as the primary manifestation of the disease, was fibromuscular dysplasia (0.38%).

The patients underwent traditional clinical examination and included clarification of complaints, comprehensive history taking, examination, palpation and auscultation of the aorta and arteries of all major vascular basins (vessels of the lower extremities, main arteries of the head), computed tomography and ultrasound examination. The clinical basis for establishing the diagnosis of AAA was the classic triad of symptoms, namely the presence of rounded, pulsating formation in the abdomen of a dense-elastic consistency, with systolic noise over it, which was confirmed by the data of computed tomography.

Conflict of interests. There is no conflict of interests.

3. Results and discussion. In order to compare the outcomes of the disease, all patients were divided into four groups (*table 1, 2*).

The first group included patients (52) with asymptomatic course of the disease

The second group included patients (68) with a low-asymptomatic clinical picture, which, as a rule, when examined, was associated with another disorder. These patients, with abdominal, urological, ischioradicular syndrome, and chronic lower limb ischemia, were found to have indirect signs of AAA, and the diagnosis was confirmed following detailed examination. In this group of patients in a non-specialized hospital, only 19 patients (28.78%) were suspected to have AAA. The remaining 49 (71.22%) were admitted to a clinic with another disorder, underlying to this disease.

The third group consisted of patients with pain syndrome in the abdomen, in the lumbar region, which was the reason to suspect AAA. Clinical manifestations of the disease in this group of patients were characterized by a rather wide spectrum: from slight discomfort in the abdomen to severe pain syndrome that usually occurred or intensified after physical or psychoemotional load and secondary to increased blood pressure.

The fourth group included patients with complicated course of the disease in the form of a rupture of aneurysm with hemorrhage into retroperitoneal space, into free abdominal cavity or into the adjacent hollow organ, as well as splitting of AAA, that is, those cases when patients required emergency surgical care.

By asymptomatic AAA, we mean complete absence of clinical presentation in the form of pain syndrome, discomfort in the abdomen and in the area of the kidneys. These aneurysms were identified as occasional findings in prophylactic

Table 1

Clinical manifestations of AAA in both groups of patients under investigation

Clinical manifestations of AAA	Number of patients	
Asymptomatic	52	19.7%
Oligosymptomatic	68	25.76%
Symptomatic	118	44.69%
Complications (rupture, splitting)	26	9.85%
Total	264	100%

Table 2

Clinical manifestations of AAA in patients of the main and comparison groups

Clinical manifestations of AAA	Main group	Comparison group
Asymptomatic	31 (19.1%)	21 (20.6%)
Oligosymptomatic	42 (25.9%)	26 (25.5%)
Symptomatic	71 (43.8%)	47 (46.1%)
Complications (rupture, splitting)	18 (11.1%)	8 (7.8%)
Total	162 (100%)	102 (100%)

examinations or in an ultrasound examination conducted routinely during a prophylactic examination. In this group of patients, AAA was detected in prophylactic examinations in 17 (32.7%), while in the rest of 35 (67.3%) when performing a planned ultrasound study, as part of comprehensive examination of persons due to other disorders of the abdominal organs, urinary tract and kidneys, as well as the spine.

Conclusions:

1. According to our data, asymptomatic AAA occurs quite often and in our study they accounted

for one fifth (19.7%) of all patients who were operated. There is a need for screening in people with risk factors, for timely diagnosis and surgical treatment of pathology, prevention of complications, including lethal ones.

2. One fourth of all patients (25.76%) were patients with oligosymptomatic aneurysms of the abdominal aorta requiring additional diagnosis.

3. Almost half of the patients, 118 (44.69%) who were admitted to the clinic, were patients with typical symptoms of AAA and correct diagnosis did not cause difficulties.

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SURGICAL APPROACH IN CONCOMITANT COMPLICATIONS OF DUODENAL ULCER

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Abstract. Authors analyzed results of surgical treatment in 307 patients with concomitant complications of duodenal ulcer.

Patients were divided into 2 groups according to the chosen diagnostic and therapeutic approach. The first group comprised 168 (54.7%) patients who underwent "traditional" gastric resection while the second group included 139 (45.3%) patients who underwent modifying variants of gastric resection.

Authors made a conclusion that improvement of definite operation types and employment of optimal treatment methods can result in a decrease in frequency of early postoperative "specific" complication by 8.3% (from 15.5 to 7.2%, $\delta < 0.01$), frequency of re-laparotomy by 4.3 (from 6.5 to 2.2%) and mortality by 2.2% (from 2.9 to 0.7%, $\delta < 0.05$), and this gives a possibility to improve the results of surgical treatment of concomitant complications of duodenal ulcers in whole.

Key words: *gastric resection, main group, control group, re-laparotomy, modification variants.*

Introduction. Up-to-date methods of complex conservative therapy both at in-patient and out-patient facilities have resulted in a decrease in the incidence of duodenal ulcer (DU), but they have not reduced frequency of complications requiring surgical interference. According to different authors, amount of complications of peptic ulcer comprises from 8 to 15 %, of all patients with gastro-duodenal ulcer [2, 3, 5, 8].

Concomitant complications of gastro-duodenal ulcer remain an urgent problem requiring further study. According to different authors, the incidence of concomitant complications varies from 25 to 30% from total number of patients with complicated gastro-duodenal ulcer [1, 4, 7, 9].

Improper administration of conservative anti-ulcer therapy, which often continues for a long time, even after the development of symptoms of complications, results in hospitalization of 48-75% patients to the surgical departments at late stages of the disease [6].

All the above determines the relevance of the conducted study.

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2. PURPOSES, SUBJECTS and METHODS:

2.1. Purpose. To improve direct and remote outcomes of surgical treatment in patients with concomitant complications of DU by using organ saving operation with one-row sutures.

2.2. Subjects & Methods. The study involved 1135 patients with complications of duodenal ulcer (DU) who were operated at the surgical department of Andijan State Medical Institute. Of them, 307 had concomitant complications of DU and were regarded as the material for the study.

The patients were divided into 2 groups according to the chosen diagnostic and surgical approaches. The first control group included 168 (54.7%) patients, who were operated in the first period (1991–1996 yy. inclusive). The second main group comprised 139 (45.3%) patients, who were operated in the second period (2010–2015 yy. inclusive). First group patients underwent "traditional" variant of gastric resection. The patient of the second group underwent modified variant of gastric resections.

Control group comprised 103 (61.3%) male and 65 (38.7%) female patients, in the main group 96 (69.1%) were male and 43 (30.9%) were female.

In the main group 46 (14.9%) were aged 20–44, the majority of patients, 198 (64.5%) aged 45 to 59.

The patients had ulcer from 1 to 21 years and more, on average 6.1 years and 32.9% patients had ulcer for more than 5 years.

The nature and incidence of concomitant complications of ulcer in control group patients is presented in *Table 1*.

The nature and incidence of concomitant complications of ulcer in patients in the group under investigation

The character of concomitant complications of DU	Groups of patients				Total	
	Control		Main			
	abs	%	abs	%	abs	%
Bleeding+stenosis	14	8.4	12	8.6	26	8.5
Bleeding + penetration	17	10.2	15	10.8	32	10.4
Penetration+ stenosis	29	17.3	23	16.5	52	16.9
Penetration + perforation	44	26.2	36	25.9	80	26.1
Penetration + stenosis	56	33.3	49	35.4	105	34.2
Penetration + perforation + bleeding	5	2.9	3	2.2	8	2.6
Penetration +perforation + bleeding + stenosis	3	1.8	1	0.7	4	1.3
All patients	168	100	139	100	307	100

In control group such concomitant complications as bleeding + stenosis were found in 14 (8.4%) cases, bleeding + penetration in adjacent organs in 17 (10.2%) cases, penetration + stenosis in 29 (17.3%) cases, penetration + perforation in 44 (26.2%) cases and such concomitant complications as perforation + stenosis were detected in 56 (33.3%) cases, penetration + perforation + bleeding in 5 (2.9%) cases and penetration + perforation + bleeding + stenosis was found in 3 (1.8%) cases.

In the main group such concomitant complications as bleeding + stenosis were found in 12 (8.6%) cases, bleeding + penetration in adjacent organs in 15 (10.8%) cases, penetration + stenosis in 23 (16.5%) cases, penetration + perforation in 36 (25.9%) cases and such concomitant complications as perforation + stenosis were found in 49 (35.4%) cases, penetration + perforation + bleeding in 3 (2.2%) and penetration + perforation + bleeding + stenosis in 1 (0.7%) cases.

Before operation patients underwent instrumental examination including esophagogastroduodenoscopy (endoscopic device PENTAX OS-A79), radiography with contrast medium and ultrasound study. Laboratory examination comprised routine clinical and biochemical blood and urine test, assessment of blood coagulation system.

Conflict of interests. There is no conflict of interests.

3. RESULTS AND DISCUSSION.

Endoscopic examination showed that 191 (62.2%) patients had damage of anterior wall of the duodenal bulb, 45 (14.6%) patients had damage in the posterior wall and 71 (23.2%) patients had damage in the lateral wall of the duodenum.

X-ray examination of DU localization showed niche symptom or convergence of mucous folds in the place of cicatricial-ulcerative deformation

Table 1

in 247 (80.4%) patients. Deformation of the bulbs of duodenum was found in 231 (75.2%) patients.

The study implied determination of evacuation function of the stomach, which was characterized by the rate of stomach emptying. The rate was classified as accelerated (evacuation time less than 1 hour), normal ($1\frac{1}{2}$ –2 hours) and decelerated evacuation (more than 2 hours).

Preoperative preparation of patients lasted for 7–10 days. During this period they underwent complex anti-ulcer therapy, correction of functional abnormalities of main internal organs, and replenishment of reserves of the body with intravenous saline and protein infusion, prescription of vitamins, etc.

Control group patients underwent such variants of anastomoses in "traditional" gastric resection as Bilioth-I gastroduodenal anastomosis; Gaberer-Finney's terminolateral anastomosis; Khachiev's terminolateral anastomosis; Gofmeyster-Finsterer's gastroenteral anastomosis; Balfur's gastroenteral anastomosis; Ru's gastroenteral anastomosis.

Table 2 presents early post-operative "specific" complications in the control group depending on the type of operation.

As can be seen on the table, duodenal stump leakage was found in 4 (2.4%) control group patients, bleeding from the area of anastomosis in 8 (4.7%) and impairment of motor-evacuator functions (MEF) in 14 (8.4%) patients. In control group

Table 2

Early "specific" complications in the control group depending on the type of gastric resection

Types of gastric operation with drainage	Duodenal stump leakage		Bleeding		MEF abnormality		Total	
	abs	%	abs	%	abs	%	abs	%
Bilroth-I GDA, n=72	–	–	3	4.2	4	5.6	7	9.7
Khachiev's TLA, n=5	–	–	–	–	1	20.0	1	20.0
Gabeber-Finney's TLA, n=34	–	–	1	2.9	3	8.8	4	11.7
Gofmeyster-Finsterer's GEA, n=43	4	9.3	2	4.6	4	9.3	10	23.3
Balfur's GEA, n=6	–	–	1	16.6	1	16.6	2	33.4
Ru-Ibadov's GEA, n=8	–	–	1	12.5	1	12.5	2	25.0
Total, n=168	4	2.4	8	4.7	14	8.4	26	15.5

patients complications associated with operative interference were observed in 26 (15.5%) cases.

Main group patients underwent the following variants of drainage in modified gastric resection: Bilroth-I-Gaberer GDA; Gaberer-Finney's TLA; Khachiev's TLA; Gaberer-Gofmeyster-Finsterer's GEA; Gaberer-Ru-Ibadov's GEA.

Modified Bilrot-I-Gabeber gastric resection. Upper median laparotomy. Strong's operation is performed after inspection of the upper floor of the abdominal cavity. The procedure implies determination of gastric resection borders, assessment of DU condition and pathomorphologic changes, location of ulcer, possibility of its removal and possible type of anastomosis. Then Kocher's maneuver is performed to achieve strictly sidewall mobilization of the stomach and DU. Selective vagotomy is performed above the level of marked resection up to the esophagus. Gastric press is superimposed at the distance of 5–6 cm perpendicular to its axis on the part of the stomach being removed from the side of greater curvature,

not getting to the lesser curvature. From the side of lesser curvature the second press is superimposed at 45° under angle to axis of the stomach. Then intersection of the lesser curvature under the second press is made with interrupted serous-muscular-submucosal sutures in one row. Then serous membrane is incised 5–6 mm proximally from the first press and circular corrugating muscular-submucosal sutures are made, reducing the diameter of pylorus to 2.5–3 cm. The gastric stump is excised between the press and sutures. Then interrupted serous-muscular sutures are made between the gastric stump and posterior wall of duodenum below the ulcer (*Fig. 1*).

The antral part of the stomach and part of the duodenum with ulcer are excised above them. Then anterior anastomosis lip is made by single-row serous-muscular-submucosal sutures. The joint place of three sutures on lesser curvature is consolidated by a "P"-shaped suture. In the end anastomosis is checked for leakproofness and

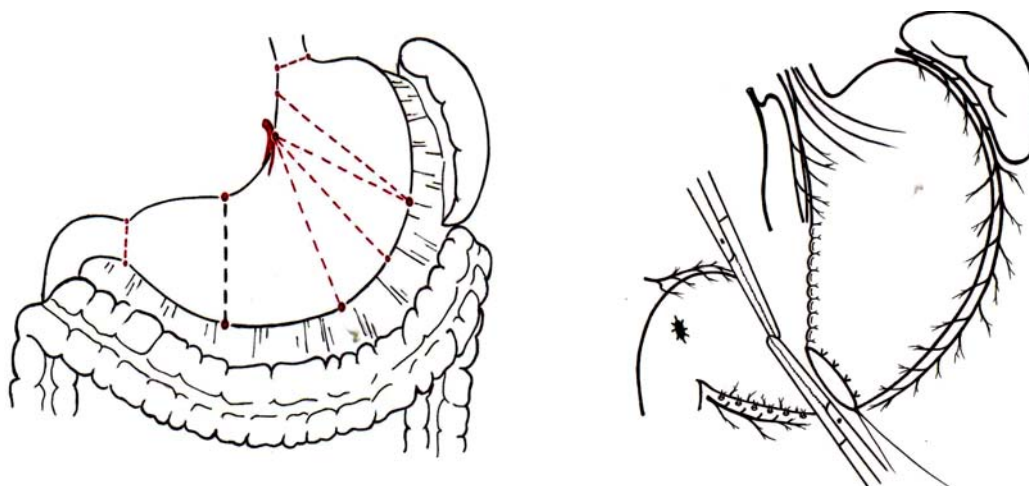


Fig. 1. Mobilization and resection of the stomach (schematic representation)

permeability. *Figure 2* presents the final type of Bilroth-I-Gaberer-Finney modified gastric resection.

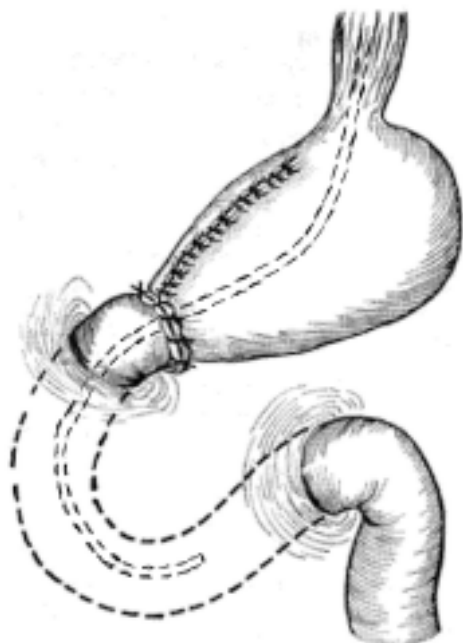


Fig. 2. The last form of modified Bilroth-I-Gabeber-Finney gastric resection

It should be noted that restriction of gastric resection by removing only antrum promotes conservation of the greater part of the stomach and allows imposing gastro-duodenal anastomosis without sutures.

Modified Gofmeyster–Finsterer's gastric resection. The gastric stump was formed as described above. *Figure 3* presents final type of modified Gofmeyster–Finsterer's gastric resections.

Modified Gofmeyster–Finsterer's gastric resection involved updated methods for suturing duodenal stump. We have revised the operative techniques and reached to conclusion, that it must provide reliability of the stump coverture with minimal injury.



Fig. 3. The last form of modified Bilroth-II-Gofmeyster-Finsterer gastric resection

Main group patients underwent 2 advanced methods for stump suturing, that enabled us to greatly spare duodenal tissue, and stump coverture in minimal pulling of tissue and slight mobilization of stump nearly excludes impairment of its blood circulation. Employment of internal drainage of stump provides reliability of the methods for prevention of duodenal stump leakage.

We use this modification of stump coverture in non-complicated and stenotic ulcers of duodenal bulb. In suturing duodenal stump it is necessary first to put 2 lateral serous-muscular sutures.

After fastening sutures the lateral sides of duodenal stump are invaginated inside and duodenal stump receives figure-of-eight form. Then "P"-shaped serous-muscular suture is put. Anterior and posterior walls of the stump are invaginated when fastening this suture.

Thus, duodenal stump is closed by interrupted single-row suture with invagination of first lateral, then anterior and posterior walls.

The advantage of this method is that single-row suture is less invasive, spares tissue for closing stumps, and is simple. The mucous membrane of the intestine remains intact. Serous-muscular sutures allow to avoid infection of sutures by intestinal contents.

In "severe" ulcers, when there is even less unchanged tissue for closing the stumps, the technique for stump coverture is as follows: two semipurse-string sutures are put for duodenal stump coverture. Besides, the needle should enter at 0.2 cm from edge of the duodenal wall, and should exit at 0.5–0.7 cm. Between the next entrance and exit of the needle the distance should also be 0.5–0.7 cm. When closing the sutures the duodenal wall should be put inside.

Necessary condition of the using the said methods is identical internal draining of the duodenal stump. For this constant nasogastroduodenal probe is directly taken into the duodenal stump.

For timely repair of motor-evacuator functions of the intestine and correction of metabolic impairments we used probe enteral feeding (conducted secondary to early intestinal stimulation), which began on the 2nd day and was carried out with poly-ionic solutions (mineral water). From the 3rd day, nutritional mixtures were added. The need for plastic material was defined with provision for degree of the impaired metabolism and values of pathological losses. In absence of complications in the postoperative period, the probe was removed on the 6th–7th day.

Main group patients had extended indications for modification of the first Bilroth technique, that is why percentage of resection with gastroduodenal anastomosis was increased from 53.9 to 78.7%. Moreover, we decided to refuse from Balfur-Mayngot's gastric resections.

Indications for Bilroth-I-Gaberer gastroduodenal anastomosis included bulbous location of ulcers, absence of large peri-ulcerous

chronic duodenal obstruction. In compensated and sub-compensated forms of chronic duodenal obstruction we performed correction by Strong's operation. One patient with decompensated degree of chronic duodenal obstruction underwent modified Ru-Ibadov's gastric resection (with invaginated entero-enteral anastomosis).

Table 3 presents early post-operate "specific" complications in the main group.

Table 3

Early "specific" complications in the main group related to gastric resection

Types of operation for gastric drainage	Duodenal stump leakage		Bleeding		MEF impairment		All	
	abs	%	abs	%	abs	%	abs	%
Bilroth-I GDA, n=77	–	–	1	1.3	2	2.6	3	3.9
Khachiev's TLA, n=8	–	–	–	–	1	12.5	1	12.5
Gabeber-Finney's TLA, n=27	–	–	–	–	1	3.7	1	3.7
Gofmeyster-Finsterer's GEA, n=23	2	8.8	1	4.4	1	4.4	4	17.6
Balfur's GEA, n=0	–	–	–	–	–	–	–	–
Ru-Ibadov's GEA, n=4	–	–	–	–	1	25.0	1	25.0
Total, n=139	2	1.4	2	1.4	6	4.3	10	7.2

infiltrate and marked deformation of the initial part of the duodenum.

Identification of the peri-ulcerous infiltrate and deformation of the bulb was regarded as an indication for terminal-lateral anastomosis. We consider L.G.Khachiev's anastomosis is the most optimal, so in absence of changes in the anterior wall of the duodenum we tried to impose anastomosis by the given method. Besides, the lateral wall of duodenum had the smallest amount of changes and imposition of sutures was suitable, we performed Gaberer–Finney's terminal-lateral anastomosis.

The indications for Bilroth-II resection included large peri-ulcerous infiltrate, "low" and difficult to remove ulcers, and decompensation degree of

As can be seen from the table, in the main group duodenal stump leakage was observed in 2 (1.4%) patients, bleeding from the area of anastomosis was found in 2 (1.4%) patients and impairment of motor-evacuation function (MEF) in 6 (4.3%) patients. In the main group complications related to surgical intervention in total comprised 10 (7.2%) cases.

Modified gastric resection and correction of post-operative management reduced the percent of MEF impairments in main group patients from 1.8 to 0.7% ($r < 0.05$), and mortality in this complication from 0.6 to 0.0% ($p < 0.01$).

Comparison of the results of surgical treatment in both groups with concomitant complications of DU (table 4) gives a possibility

Table 4

Comparison of results of surgical treatment in the main and control group patients

Patients group	Groups of patients		Improvement of the results by
	Control n=168	Main n=139	
Complications related to surgical intervention:			
1. Duodenal stump leakage	4 (2.4)	2 (1.4)	2 (1.0)
2. Bleeding	8 (4.7)	2 (1.4)	6 (3.3)
3. MEF impairment	14 (8.4)	6 (4.3)	8 (4.1)
All complications	26 (15.5)	10 (7.2)	16 (8.3)
Re-laparotomy	11 (6.5)	3 (2.2)	8 (4.3)
Mortality	5 (2.9)	1 (0.7)	4 (2.2)

to draw a conclusion that in the main group of patients we were able to reduce the incidence of complications related to surgical intervention, frequency of re-laparotomy and mortality rate.

Conclusion. Elaborated by the authors and updated separate surgical techniques as well as employment of optimal ways for the treatment of complications allowed to reduce

the incidence of early post-operative "specific" complications by 8.3% (from 15.5 to 7.2%, $p<0.01$), frequency of re-laparotomy by 4.3 (from 6.5 to 2.2%) and mortality rate by 2.2% (from 2.9 to 0.7%, $p<0,05$), therefore, promoting improvement of the results of surgical treatment of concomitant complications in patients with duodenal ulcers.

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PREDICTION OF BRONCHIECTASIS DEVELOPMENT RISK IN CHILDREN WITH CYSTIC FIBROSIS

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Abstract. Cystic fibrosis (CF) is a genetic disease with a multiple organ type of lesion and life-threatening respiratory disorder. The purpose of the study was to improve medical care for patients with CF by treatment individualization according to the prediction of the respiratory tract complications development. The study involved 42 children with CF. Patients were divided into 2 groups: main (with bronchiectasis) and control (without bronchiectasis) group. One hundred twelve clinical and paraclinical indices were analyzed. After that the logistic regression method with step-by-step incorporation of predictors was used to analyze the features and to select meaningful criteria for prognosis. The mathematical model for predicting bronchiectasis development in children with CF was created. It should help to make an individual algorithm for treatment using non-specific research methods in order to prevent the progression of morphological changes in the respiratory tract in patients with CF.

Key words: *children, cystic fibrosis, bronchiectasis, mathematical model, predicting.*

Introduction. Cystic fibrosis (CF) is a genetic disease, which is caused by mutation of the cystic fibrosis transmembrane conductance regulator (CFTR) protein with involvement of the exocrine glands of vital organs and systems [1-4].

CF affects a variety of organs, but especially involving respiratory tract and pancreas [5]. The lungs undergo gradual destruction, as an effect of persistent microbial colonization, chronic inflammation and recurrent infections caused by highly pathogenic bacteria, such as *Pseudomonas aeruginosa* and *Staphylococcus aureus* (*S. aureus*), as well as *Hemophilus influenzae*, *Stenotrophomonas maltophilia*, *Achromobacter xylosoxidans*, *Burkholderia cepacia* complex etc. Several constituents of the innate immunity are also affected by the disease [6]. As a consequence, despite the amazing progress in treating CF-related lung disease, it still accounts for nearly 85% of the mortality [7].

The airways of the affected lungs are clogged by purulent secretions and deformed due to the development of bronchiectatic lesions, while in the parenchyma the formation of multiple cavitations or cysts, areas of bronchiolar

consolidation, fibrosis and air-trapping compromise respiratory adequacy [8]. Bronchiectasis has a highly variable clinical presentation, as it is a disorder that can affect any age from young children to the very elderly, males and females, and it is present in all ethnic groups [9]. As such, it is not possible to describe a single typical clinical presentation [10]. Bronchiectasis is a chronic airway disease that has increased in prevalence over the past decade and is associated with growing morbidity and mortality rates worldwide [11]. As a complex multicomponent disease, bronchiectasis is characterized by chronic systemic inflammation that frequently coexists with comorbidities, which might be causative, synergistic, or coincidental, depending on how they interact [12, 13].

Bronchiectasis is a marker of severe cystic fibrosis course. Modern medical protocols for medical care to patients with CF include a large number of medications aimed at various parts of pathogenesis of the disease and affect the various systems of the organism [14]. Predicting the development of this pathology should improve the life quality of patients with CF.

2. PURPOSES, SUBJECTS and METHODS:

2.1. Purpose – to improve medical care for patients with CF by treatment individualization according to the prediction of the respiratory tract complications development.

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2.2. Subjects & Methods. The research was conducted in the pulmonology department of the Kharkiv Regional Clinical Children's Hospital No 1 in 2015–2017. Clinical and paraclinical examination of patient with CF were carried out according to the Order of Ministry of Healthcare of Ukraine as of 15 July 2016 No. 723 "On approval of the unified clinical protocol of primary, secondary (specialized) and tertiary (highly specialized) medical care "Cystic fibrosis", Order of Ministry of Healthcare of Ukraine as of 29 January 2013 No. 59 "On approval of unified clinical protocols of medical care for children with diseases of the digestive system".

Patients with CF were divided into 2 groups: main (with bronchiectasis) and control (without bronchiectasis). One hundred twelve indices were analyzed (passport data (age), presentation, present and past history, clinical signs of organs and systems lesions, laboratory and instrumental research results (blood and urine analysis, coprogram, spirometry, electrocardiography, computed tomography of the chest, ultrasound examination of the abdominal cavity, bacteriological examination of sputum, bronchial washings, immunological parameters and total immunoglobulin E, data of allergy testing, etc.). The logistic regression method with the step-by-step incorporation of predictors was used to analyze the features and to select meaningful criteria for the mathematical model creation. Mathematical processing of the results was carried out using the SPSS 23 software for Windows.

The study was conducted with respect to human rights in accordance with the legislation in force in Ukraine, in compliance with international ethical requirements and did not violate ethical norms in science and standards for conducting biomedical research.

Conflict of interests. There is no conflict of interests.

3. Results and discussion. The study involved examination of 42 children. Diagnosis of CF was based on clinical and paraclinical characteristics and confirmed by the results of pilocarpine test.

Main group included 17 patients with bronchiectasis and control group comprised 25 patients. There were predominantly girls in the main group (52.9 %, $p=0.055$).

According to age, the majority were children of senior school age (*table 1*).

CF manifestation was represented by the gastrointestinal signs prevalence without a significant difference between the main and control groups (76.4 % vs 72.0 %, $p=0.746$ respectively).

In the majority of main group, the first gastrointestinal signs of the disease were identified during neonatal period (52.9 %), compared with the control group (in infant period – 68.3 %, $p=0.340$).

Regarding the symptoms of the respiratory system for patients with bronchiectasis, there was a tendency for their later manifestation – in preschool period (52.9 %) compared with the control group (in infant period – (48.0 %, $p=0.585$).

The sweat chloride test results of the main group were significantly higher (123.7 ± 7.18 mmol/l) compared with the control group (93.8 ± 5.15 mmol/l, $p=0.034$).

The spirometry was defined in children over 5 years ($n=31$) and showed significant decrease in the examination basic parameters (*table 2*).

The incidence of lung fibrosis (100%) was significantly higher ($p=0.003$) in the main group. Typical bronchiectasis of patients with CF is shown on *Figure*.

Assessment of bacteriological tests showed that *Pseudomonas aeruginosa* (64.7 % vs 24.0 %, $p=0.014$), *S. aureus* (76.4 % vs 40.0 %, $p=0.028$), *Alcaligenes faecalis* (23.4 % vs 0 %, $p=0.025$) were significantly more common in the main group patients.

Table 1

Distribution of children with CF and bronchiectasis by age

Age \ Group	1 year – 2 year 11 months 29 days		3 years – 6 years 11 months 29 days		7 years – 11 years 11 months 29 days		12 years – 17 years 11 months 29 days		Total n
	n	%	n	%	n	%	n	%	
Main	3	17.6	3	17.6	3	17.6	8	47.2	17
Control	1	4.0	3	12.0	11	44.0	10	40.0	25
Total	4	9.5	6	14.2	14	33.4	18	42.9	42

Table 2

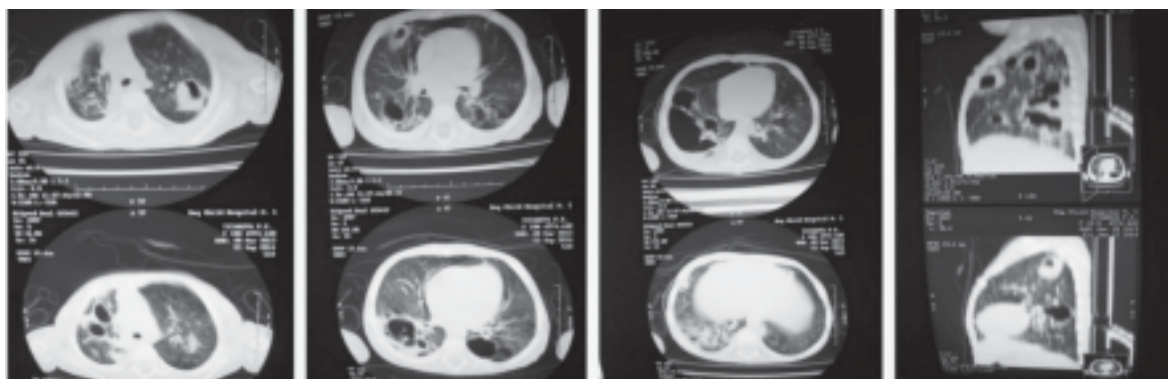
Spirography test in children with CF

Spirography indices	Main group (n=14)	Control group (n=17)	p
VC, %	66.5 (62.25; 68.25)	71.0 (67.0;80.0)	0.013
FVC, %	65.0 (59.0;69.0)	69,0 (67.5;80.5)	0.010
FEV1, %	70.0 (65.0;74.0)	72,0 (70.5;82.0)	0.101

The study of the liver parenchyma impairment showed that the incidence of cirrhotic lesions of the liver parenchyma was significantly higher in the main group compared to the control (41.2 % vs 8.0 %, $\delta=0.011$).

Features of immune status in children with CF and bronchiectasis are presented in Table 3. There was a significant increase in phagocytosis of latex, lymphocytes, spontaneous nitroblue

\tilde{O}_1 – phagocytosis of latex (%);
 \tilde{O}_2 – sweat chloride level (mmol/l);
 \tilde{O}_3 – evaluation of liver parenchyma according to ultrasound examination (1– norm, 2 – increased liver echodensity at ultrasound examination, 3 - cirrhotic lesions of the liver parenchyma);
 \tilde{O}_4 – S. aureus (in sputum) (1 – no, 2 – yes).



Bronchiectasis in the child with CF

tetrazolium tests, spontaneous index of activated neutrophils test decreasing compared with the control.

Thus, observation of patients with CF and bronchiectasis has revealed a number of clinical and laboratory signs regarding the prediction of morphological changes in the respiratory tract. Using simple methods of nonparametric statistics during definition of significant conclusions is complicated by the rarity of the pathology and a little number of patients. Therefore, to objectivize the evaluation of the individual factors influence in bronchiectasis pathogenesis in CF, a logistic regression method was used to determine the coefficients of regression function.

After the mathematical model formation, the logistic regression equation, which determines the probability of bronchiectasis developing in children with CF, has the following form:

$$\tilde{D} = [1 + \exp(-(0,316 \times \tilde{O}_1 + 0,083 \times \tilde{O}_2 + 4,009 \times \tilde{O}_3 + 6,778 \times \tilde{O}_4 - 43,372))]^{-1}, \text{ where}$$

\tilde{D} – the risk factor for the bronchiectasis development in a child with CF;

The P value is in the range from 0 to 1 and reflects the probability of the risk of bronchiectasis formation in a child with CF. If $P \geq 0.5$, it predicts a high risk of bronchiectasis formation, and if $P < 0.5$, it predicts a low risk of bronchiectasis formation.

All variables, according to Wald test, are significant ($p < 0.05$) and are selected correctly. The overall assessment of the coincidence between the identified risk factors in the model and the actual observed adverse event was conducted using the Hosmer and Lemeshow test, the accuracy of the classification was 95.2 %.

The effectiveness of the proposed mathematical model is illustrated by the following clinical case.

A 12-year-old boy S. was admitted to Kharkiv Regional Clinical Children's Hospital No. 1 for the preventive treatment course. The patient presented with coughing with periodic sputum of yellow color, periodic bitter taste in the oral cavity. The condition was assessed as moderate due to respiratory and gastrointestinal disorders.

Table 3

*Indices of immunological status of children with CF and bronchiectasis
(Median; Q1; Q3)*

Indices	Main group (n=17)	Control group (n=25)
Leukocytes, x10 ⁹ /l	6.5 (5.4;7.05)	6.0 (5.0;7.8)
Neutrophils, %	50.0 (42.5;68.5)	44.0 (38.5;58.0)
Lymphocytes, %	45.0 (29.0;56.5)*	57.0 (44.0;63.0)
CD 3, %	69.0 (64.5;70.0)	68.0 (64.0; 70.0)
CD 4, %	40.0 (38.0;40.5)	39.0 (38.0;41.0)
CD 8, %	27.0 (25.0;28.5)	28.0 (26.5;29.0)
CD 16, %	13.0 (9.5;15.5)	14.0 (10.0; 18.0)
CD 22, %	19.0 (18.0;20.0)	18.0 (16.0; 21.0)
CD 25, %	21.0 (18.0;29.5)	22.0 (18.5; 37.0)
Phagocytosis of latex, %	69.0 (58.0;74.0)*	63.0 (56.5; 68.0)
Phagocytic number	3.8 (3.75;4.1)	3.8 (3.7;4.1)
Total complement (CH 50)	64.0 (62.0;67.5)	64.0 (60.5; 66.0)
Circulating immune complexes with 3.5% PEG, units	8.1 (7.3;10.1)	7.7 (6.25;9.25)
Spontaneous nitroblue tetrazolium (NBT) tests, %	16.0 (12.0;28.0)*	33.0 (18.0; 47.0)
Spontaneous index of activated neutrophils (IAN) test, units	0.3 (0.21;0.55)*	0.69 (0.32;0.92)
Stimulated NBT test, %	65.0 (59.0;72.0)	63.0 (56.0;69.0)
Stimulated IAN test, units	1.34 (1.07;1.48)	1.34 (1.17;1.49)
Lysosomal cationic proteins, units	1.18 (1.09;1.24)	1.18 (0.98;1.23)
Ig A, g/l	1.29 (1.07;1.64)	1.38 (0.99;1.54)
Ig M, g/l	1.02 (0.9;1.22)	0.92 (0.81;1.22)
Ig G, g/l	10.38 (10.25;10.76)	10.36 (9.9;10.93)
Ig E, g/l	86.2 (28.1; 486.1)	56.0 (27.1;178.4)

* p <0.05 - compared with the control group

The child was from the second pregnancy, after 40 weeks of gestation by first vaginal delivery with a birth weight of 2800 gm, height of 46 cm.

From the age of 6 months the mother took notice of cough, which was initially dry, then with sputum of whitish color. At the age of 8 months the child had pneumonia with prolonged severe course. After recovery, the child was referred for a medical genetic center, where CF was diagnosed based on clinical and paraclinical signs, positive sweat chloride test (105/112 mmol/l) at the age of 1 year 2 months.

At the age of 2 years, CFTR genotyping was performed and a carrier delF508 in a compound with an unidentified CFTR gene mutation was found.

At the age of 8 year, during the planned liver ultrasound examination, the increased liver echodensity was detected. Hepatoprotective

therapy was intensified. For 2 years, the child did not undergo preventive examination.

At the age of 10 years, signs of lung fibrosis were identified on both sides.

On examination: poor physical growth and development. Body mass index (BMI) was 15.4 kg/m² (equivalent to BMI <10 percentiles). Skin was pale. Deformation of the fingers and fingernails (clubbed fingers and watch-glass nails) were found. Thoracic cavity was the cylindrical shape. Percussion sound was shortened in back basal areas with excessive resonance in the upper and middle areas. Harsh breathing, moist small and medium bubbling rales were detected in back basal areas during lung auscultation. Heart sounds were rhythmic, sounding. Stool was 2–3 times per day.

Level of sweat chloride was 102 mmol/l.

The results of laboratory studies were as follows: sputum bacteriological tests –

S. epidemidis 10⁵, *S. aureus* 10⁶, *C. albicans* 10³; ultrasound examination of the abdominal cavity – increased liver and pancreas parenchyma echodensity; immunological research – leukocytes 6,5×10⁹/l, Neutrophils 54 %, Lymphocytes 46 %, CD3 64 %, CD4 32 %, CD8 40 %, CD16 22 %, CD22 18 %, CD25 20 %, Phagocytosis of latex 76.0 %, Phagocytic number 3.9 un., Total complement (NĀ 50) 65 %, CIC with 3.5 % PEG 9.5 un., Spontaneous NBT tests 28 %, Spontaneous IAN test 0.32 un., Stimulated NBT test 59 %, Stimulated IAN test 1.04 un., Lysosomal cationic proteins 1.12 un., IgA 1.14 g/l, IgG 0.96 g/l, IgM 10.21 g/l.

The calculation of the bronchiectasis development risk by using the mathematical model was done:

$$D=[1+\exp(-0.316\times 76+0.083\times 102+4.009\times 2+6.778\times 2-43.372)]-1=0.9.$$

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0.9>0.5 – conclusion was the high risk of bronchiectasis development.

The computed tomography of the chest confirmed widespread bilateral cylindrical bronchiectasis. Patient S. had bronchiectasis corresponding to the prognosis.

The mathematical model testing for patients with CF from the Dnipro Region was carried out. Efficiency was 86.7 %.

The mathematical model is easy to use. Its application should improve the bronchiectasis risk predicting and timely correction of therapy.

Conclusion. The mathematical model for predicting of the bronchiectasis development in children with CF was created. It should help to make an individual algorithm for treating using non-specific research methods in order to prevent the progression of morphological changes in the respiratory tract in patients with CF.

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IRON SUPPLEMENTATION IN TREATMENT OF CHILDREN WITH LOW RESPIRATORY INFECTION AND IRON DEFICIENCY ANEMIA

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Abstract. Upper respiratory tract infections as well as bronchitis and pneumonia are most common causes for hospitalization of children. Younger children are more predisposed to these problems and its complications. Anemia is one of the most common comorbidity of this pathology. We analyzed 52 case histories of children diagnosed with pneumonia and deficiency anemia. The study evaluated presentation, history, clinical and laboratory data. Our results suggest that ferrotherapy helps with acceleration of low respiratory tract infections' symptoms

Key words: *lower respiratory tract infection, anemia, children, iron supplement.*

Introduction. Infection of the lower respiratory tract is the main cause of mortality in children worldwide due to developing complications, in the form of intoxication and obstructive syndromes. Pneumonia is the leading cause of death among children under 5 years [1]. The estimated incidence in this age group in developed countries is 1 in 15 episodes per child year [2]. This amounts to about 156 million new cases for the first time per year per child population [3]. One of the most common comorbidities of the low respiratory tract infections is deficient anemia, mainly iron deficiency anemia. 50% of all cases of deficient anemia are iron deficiency states and in the opinion of many authors, iron deficiency anemia is one of the most common contributing factors in pneumonia [4].

Anemia is a group of clinical hematological syndromes, the general criterion of which is a decrease in the concentration of hemoglobin and/or erythrocytes per unit volume of blood [4].

According to the literature [5], the pathogenic mechanism for the development of microbial inflammatory diseases in patients with anemia is associated with oxygen starvation of tissues, and with trophic disorders in the mucosal endothelium walls, leading to a decrease in the protective functions of the endothelium, including the secretory immunoglobulin A.

In addition, the effects of iron deficiency also lead to [6]:

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- violation of neuro-psychological functions in children;
- decrease in intellectual development indices;
- retardation of the development of logical thinking and speech with potential learning difficulties;
- degenerative-dystrophic changes in the epithelium of the skin, mucous membranes of the gastrointestinal tract, respiratory tract, which is one of the reasons for the development and progression of microbial inflammatory diseases.

Since the role of anemia in the development of microbial inflammatory diseases of the lower respiratory tract is undeniable, it is worth knowing the causes and early signs of anemia.

The causes of anemia in young children include: multiple pregnancies, iron deficiency anemia in the mother during pregnancy, bleeding during pregnancy and childbirth in the mother and/or child, the use of unadapted mixtures, cow or goat milk for feeding, qualitative and quantitative non-correlation of feed. according to the age.

The clinical signs of anemia include: sideropenic and anemic syndromes. Thus, early signs of anemia: lethargy, emotional weakness, psychomotor retardation, increased heart rate, weakening of heart tones, functional systolic murmur, tachypnea, prolonged low-grade fever, loss of appetite or lack of it, dry skin, dullness, hair loss, fragility, layering of nails, stomatitis, perversion of taste and smell.

2. Purposes, subjects and methods:

2.1. Purpose – to establish the relationship of iron deficiency anemia and infection of the lower respiratory tract in young children.

2.2. Subjects & Methods. A retrospective study was conducted over two years (2015–2017) for children aged from 3 months to 35 months who were admitted to Kharkiv Regional Children Clinical Hospital. The study included 82 diagnosed cases of infections of the lower respiratory tract: 52 patients diagnosed with acute pneumonia and iron deficiency anemia (group I) and 30 patients diagnosed with acute pneumonia without anemia (group II).

Patients with prematurity, chronic inflammatory diseases, dietary disorders and severe systemic diseases, despite the presence of diagnostic criteria for pneumonia and iron deficiency anemia were excluded from the study.

Standard diagnostic protocol was applied, which included assessment of history and clinical data, chest radiography and sputum culture. CBC with platelet count, reticulocyte count and color index allowed to establish the etiology of anemia as well as iron level in the blood.

The following equation [7], which is especially relevant when evaluating CBC performed by using a hardware hemo-analyzer, was used to calculate the color index:

$$\text{color index} = 3 * (\text{Hb in g/l}) / \text{three first digits of the number of erythrocytes}$$

Conflict of interests. There is no conflict of interests.

3. Results and discussion. Patients were equally distributed by age (2.9 ± 0.4 vs. $2.9 + 0.6$ years, $p < 0.05$) and sex (60.4 vs. 57.9 % of boys, $p < 0.05$).

In both groups, respiratory syndrome, broncho-obstructive syndrome and intoxication were recorded in patients with the same frequency. Pneumonia was confirmed radiologically in 100% patients of both groups. There were no differences in the degree of

inflammation by CBC data: an increase in the number of neutrophils (12.4 ± 3.3 vs. $11.7 \pm 4.1 \times 10^9$, $p < 0.05$), and accelerated ESR (22.3 ± 1.3 vs. 19.3 ± 0.9 mm/hour, $p < 0.05$).

In group I clinical and laboratory data corresponded to moderate deficiency anemia: hemoglobin (83 ± 0.2 g/l), hypochromic RBC (color index 0.64 ± 0.03 cu) with normoregenerative state (level of reticulocytes $1.2 \pm 0.1\%$).

Interestingly, that decreased iron level (up to 6.4 ± 0.3 $\mu\text{mol/l}$) with no CBC changes was detected in Group II patients, which allowed us to diagnose latent sideropenia.

In therapy, patients of both groups received symptomatic and antibacterial therapy, according to the relevant recognized protocols. In addition, patients of group I received iron supplement therapy with Fe²⁺ at a dose of 5 mg/kg/24h.

As a result of the treatment, Group I patients were found to have a reduction of clinical symptoms of bronchial obstruction in 2.2 ± 0.2 days, and intoxication syndrome in 2.1 ± 0.4 , earlier than Group II patients ($p < 0.05$ for both).

Conclusions:

1. Lower respiratory infections are associated with the presence of anemia and sideropenic states in young children. That is why it is advisable to perform detailed CBC test (with platelets, reticulocyte count and color index) and to determine the iron level if indicated for the early diagnosis of iron deficiency states in young children with low respiratory tract infections.

2. Early diagnosis of iron deficiency and prevention of anemia are important measures for reducing the incidence of lower respiratory infections in young children.

3. Iron supplement therapy helps to reduce the symptoms of low respiratory tract infections.

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A CASE OF BOTULISM (CASE REPORT)

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Abstract. Data on rising number of cases of food botulism in Ukraine is discussed in the article. As a clinical example, unusual case of food-borne botulism of a patient in Kharkiv is described. Peculiarity of the case is a development of symptoms of the disease in patients with compromised psychoneurological background and exacerbation of chronic pancreatitis so the clinical presentation mimicked other acute progressive neurological disorders. Differential diagnostics is presented. Experience and effectiveness of Heptavalent Botulism Antitoxin (HBAT), which was used for the first time in our hospital for treatment of botulism is discussed.

Key words: *symptoms, treatment, heptavalent, botulism, antitoxin.*

Introduction. Botulism is an uncommon paralytic disease caused by neurotoxins produced by *Clostridium Botulinum* (toxin types A, B, E, F, and H), and rarely, by botulinum-producing strains of *Clostridium butyricum* (type E toxin), *Clostridium baratii* (type F toxin) and *Clostridium argentinense* (type G toxin). Spores, formed by strains of *C. botulinum* Group I, are highly resistant to heat, and "Botulinum cook" at 121°C for 3 minutes given to low acid canned foods has been designed to inactivate these spores [1]. The number of neurotoxin genes present in the genome, and neurotoxins actually formed by strains of *C. botulinum* Group I is variable, with strains possessing from one to three neurotoxin genes, and forming one to three different neurotoxins. There are five forms of botulism, characterised by the mode of acquisition: infant botulism, wound botulism, foodborne botulism, adult enteric infectious botulism, and inhalational botulism [2, 3]. The germination and subsequent production of the toxin in foods only occurs under anaerobic, low-salt and low-acid conditions. Both canning and fermentation of food create anaerobic conditions that facilitate the growth of *C. botulinum* spores and contaminated home- or commercially-canned foods which typically include fish, meat and vegetables [4].

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Over the last four years, Ukraine faced an outbreak of botulism. From the beginning of 2018, 80 cases have been recorded, 9 of them were fatal. Cases of deaths from botulism that occurred in 2018 year in Kyiv, Poltava, Sumy, Kharkiv and Cherkasy regions were associated with the use of dried fish of industrial production. In other cases, people died after consuming dried fish of domestic production, as well as homemade stew and salted-smoked fish. Despite of growing number of cases of the disease practicing physicians still may face difficulties in proper diagnosis. Usually, the diagnosis should be suspected on clinical grounds in the context of an appropriate history. Diseases, most frequently confused with botulism are those that produce generalized weakness, neurological symptoms or even diarrhoeal diseases. Proper differential diagnosis of botulism from other diseases is essential for early initiation of specific treatment or proper direction of a patient to specialized hospital. Botulism is relatively easy to consider in patients who are afebrile and previously mentally intact but suddenly develop symmetric descending paralysis without sensory abnormalities. But cases of the disease in patients with compromised psycho – neurological background is always a big challenge so the clinical presentation can mimic other acute progressive neurological disorders.

Clinical case. Our study involved assessment of a clinical case of botulism to illustrate a diagnostic problem. A 22-year-old female

presented with moderate spasmodic colics in the left paraumbilical area, nausea, vomiting, dizziness, bitterness and dryness in the mouth, double vision and expressed weakness. With suspected acute pancreatitis she was admitted to surgical department. After diagnostic procedures exacerbation of chronic pancreatitis was confirmed. Urgent laboratory examination showed an increased level of serum amylase to 40.1 mg.hr/ml and neutrophilic leucocytosis which also confirmed the diagnosis.

But additionally to the signs of pancreatitis unusual symptoms were revealed. She developed diplopia, severe dryness in the mouth, feeling of "clod" in her throat, choking in process of drinking of water, constant moderate headache and irritability. Therefore, she was examined by a neurologist. Neurological examination showed horizontal nystagmus, with no signs of central nervous system damage, bilateral ophthalmoplegia, full symmetrical paralytic mydriasis, lower motor neuron facial weakness, dysarthria, dysphonia and glossal paresis. She had subtle distal weakness in both hands. Reflexes were retained. The patient remained alert and afebrile. She was also tachypnoic to 28/min. The oxygen saturation was 98% while breathing ambient air.

According to past history the patient was under supervision of psychoneurologist for about ten years with some disorders. Six years before she was admitted to psychoneurological hospital for a long treatment. Previously the patient repeatedly imitated suicide through cutting of her peripheral veins. Patient also smoked about 20 cigarettes a day and quite often drank alcoholic drinks. Epidemiological data suggested that about four hours before disease onset she ate dried fish (roach) which she bought in the nearest market. No family members consumed this food so they remained healthy at the moment of patient examination.

According to all data the diagnosis of botulism was suspected. The patient was urgently transferred to Kharkiv Regional Hospital of Infectious Diseases. On examination, the patient appeared anxious, with dry mucous membranes. The hematocrit, platelet count, erythrocyte sedimentation rate, and levels of hemoglobin were normal, as were tests of renal and liver function. But there were disturbances of acid-base balance as decompensated respiratory acidosis, namely pH 7.193, pO_2 145.3 mm Hg, pCO_2 70.8 mmHg. Follow-up electrocardiography did not show any abnormalities.

Within four hours her condition deteriorated rapidly; she developed respiratory failure, SpO_2

level fell till 80% and required intubation and ventilation. A nasogastric tube was inserted and formula feedings were administered. Her condition continued to worsen and she developed acute flaccid symmetrical paralysis. Psychomotor excitement was accompanied probably due to accompanied chronic psychoneurological disease.

On the second day of disease, the day of admission, the patient was treated with Heptavalent Botulism Antitoxin (A, B, C, D, E, F, G) and required ten days of mechanical ventilation and 20 days of intensive care support. Blood, stool and gastric washings were cultured, but no *Clostridium* species were isolated. In this case, the mouse neutralization test was used to detect toxin in serum and an aqueous extract of stool. *C. botulinum* toxin type A was confirmed. On the next day her fever was accompanied by auscultatory symptoms, namely reduction of pulmonary sounds and moist rales in her left subscapular zone suggested pneumonia in the left lower lobe which was confirmed by radiography of the chest on the 7th day of the disease. A course of antibacterial treatment started with ceftriaxone 2.0 g twice a day intravenously in combination with levomycetin 500 mg 4 times a day. But in progress of the disease febrile condition was accompanied by leucocytosis 10.8×10^9 , ESR increased to 34 mm/hr and neutrophilic shift. Culture from endotracheal tube showed growth of *Acinetobacter lwoffii* and *Candida spp.* According to the data antibacterial treatment was changed to metronidazole 1.5 g daily dose in combination with meropenem 6 g as a daily dose.

In the process of treatment infiltration regressed to 22nd day of her disease. The patient also was provided symptomatic treatment to regain water–electrolyte balance and neuromuscular transmission.

The patient's motor function showed signs of paralysis, absence of spontaneous breathing, controlled with artificial respiration in VCV regimen in combination with medication sleep because of continued encephalopathy of mixed origin. The patient returned to spontaneous breathing on the 11th day of disease. There was enteroparesis with absence of intestinal peristalsis sounds and spontaneous defecation. Follow-up neurological examination revealed stable divergent strabismus of both eyes, expressed bilateral ptosis, diplopia when looking from side to side persisted, decreased deep reflexes in lower limbs. Muscular paresis was severe till the 10th day of disease and Babinsky sign was present on both legs. Follow-up neurological status gradually

improved to the 28th day of disease. The patient still presented with mouth dryness and persistent constipation. One month after the onset of her symptoms, she was discharged home.

Discussion. Although classical botulism is a quite rare disease in developed countries, in some regions there are increased number of cases, first of all with specific food habits and privileges of local population. In European countries there are only sporadic cases of the disease, in USA there are about 110 cases of botulism a year, most of them are cases of infant botulism [5]. In Ukraine some of such factors are wide consumption of homemade canned meat and dry fish, quite often bought in uncontrolled markets, without thermal treatment. According to reports from different countries same clinical data typically appear within 12 to 36 hours after the consumption of the tinned or dry food. Anorexia, nausea and vomiting (77.4%), abdominal pain (54.8%) and blurred vision with diplopia (48.4%) are the most usual clinical symptoms followed by the progressive muscular weakness of the face, neck, trunk, and limbs as well as by respiratory insufficiency primarily due to paresis of diaphragm [6–8]. About 70% of the patients have three of five symptoms as nausea and vomiting followed by meteorism and stable constipation, dysphagia, diplopia, and a group of ophthalmoplegic symptoms eyelid ptosis, more or less expressed paralytic mydriasis, blurred vision with sense of "net" or "mist", which are the combination of neurological and gastrointestinal symptoms. Typically differential diagnosis includes Guillain-Barré syndrome, Miller-Fisher syndrome, stroke, chemical intoxication and staphylococcal food poisoning. Suspected drug and alcohol abuse may occasionally prolong the time for diagnosis to be made [9]. In the presented case symptoms of exacerbation of chronic pancreatitis and some psychoneurological disease, unclear due to lack of history data mimicking clinical symptoms resulted in some delay before proper diagnosis was made and treatment started. Botulism is a life-threatening disease, but rapid laboratory diagnosis, required for successful therapy is still not always available in practical clinical medicine. Of these, detection of toxin in the patient's serum and/or feces remains the standard method [10]. Detection of *C. botulinum* in patient samples, such as feces, gastric and intestinal contents, and wound swabs and tissues, supports the diagnosis but should not exclusively be considered pathognomonic of the disease [11]. So the mouse lethality assay (neutralization test) has remained

the standard test for the detection of botulinum neurotoxins, as in the case. According to time of getting the results specific treatment should not be delayed and started empirically in most of our cases based on experience of the specialist. For the last two years we for the first time in Ukraine used Heptavalent Botulism Antitoxin (HBAT) (Emergent BioSolutions, Canada), which is a mixture of immune globulin G fragments against botulinum neurotoxins of types A, B, C, D, E, F, G, which had the Fc portion cleaved off, leaving the F(ab')₂ and Fab portions. This process renders it less effective in neutralizing toxin than trivalent (against types A, B, and E) botulinum antitoxin (contains whole antibodies – Fab & Fc portions) that is available from local health departments [12].

HBAT is indicated for the treatment of symptomatic botulism following documented or suspected exposure to botulinum neurotoxins in adults and pediatric patients. HBAT was approved in 2010 by the CDC and was licensed for commercial marketing by the FDA in 2013. The effectiveness of HBAT is based solely on efficacy studies conducted in animal models of botulism. HBAT was approved in 2010 by the CDC on an investigational basis, and was licensed for commercial marketing by the FDA in 2013. The effectiveness of HBAT was based solely on efficacy studies conducted in animal models of botulism. In two clinical studies cited by Emergent BioSolutions the safety profile of HBAT was proven acceptable when one or two vials of the antitoxin were intravenously delivered to healthy subjects.

The mechanism of action of HBAT is through passive immunization with equine polyclonal antibody fragments against botulinum neurotoxins. In the circulation these antibody fragments bind to free toxins. This prevents the toxins from interacting with ganglioside anchorage sites and protein receptors on the cholinergic nerve endings. In turn this prevents toxins internalization into the target cells. The antibody/antigen complexes are then cleared from the circulation by the organs involved in processing immune complexes. Experimental evidence concerning the amount of circulating antitoxin needed to counteract toxins intoxication is not fully documented. The outcome of treatment depends, as it does with other comparable conditions, largely on the time interval elapsing after the onset of symptoms and antitoxin administration.

In our case the patient with severe complicated food-borne botulism treated with

HBAT successfully recovered and was discharged after one month of treatment. Also the patient had no allergic or other side effects in process of treatment.

Conclusions:

1. Difficulties in diagnosis of food-borne botulism are conditioned by rare incidence of the disease and absence of vigilance of general

practitioners. In addition chronic gastrointestinal and psychoneurological diseases can mask clinical symptoms, as in this case.

2. Heptavalent Botulism Antitoxin (A, B, C, D, E, F, G) was used in Ukraine for the first time, and it was proven as an effective method in complex treatment of severe complicated case of food-borne botulism.

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GENDER CHARACTERISTICS OF DEPRESSIVE SYMPTOMS OF DEMENTIA IN PATIENTS WITH SUICIDAL BEHAVIOR

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Abstract. Dementia is in most cases comorbid, which greatly reduces the quality of patients' life and increases the risk of suicidal manifestations.

The aim of the study is to determine gender characteristics of depressive symptoms in patients with various clinical types of dementia with high suicide risk.

The object and methods of research. The study involved examination of 105 patients with dementia of different types (due to Alzheimer's disease, vascular and mixed one) with high suicide risk using the Hamilton Depression Rating Scale (HDRS).

Results of the research. Statistical analysis showed that a high degree of depression is a marker of suicidal risk in men with a vascular type of dementia, and in women with a mixed type of dementia. Verbalization (statement of suicidal intentions, thoughts) and the behavioral component of suicidal behavior (attempts) with a pronounced torpidity of mental processes are typical for men with Alzheimer's disease and vascular dementia and for women with a mixed type of dementia.

In women, affective oscillations during the day increased SR in Alzheimer's disease, and frequent waking at night in mixed dementia. Physical limitations and inability to perform work, the problems with sexual vigor can be considered a psychogenic factor of high SR in men with vascular impairment.

Key words: *dementia in Alzheimer's disease, vascular dementia, mixed dementia, gender differences, depressive symptoms, predictors of suicidal behavior.*

Introduction. In recent works we proved that the presence and intensity of depressive symptoms, depressive episodes in past and suicidal attempts in history and/or in the family belong to the main clinical-psychopathological predictors of suicidal behavior (SB) in dementia [1, 2]. We marked correlation dependence of high suicidal risk (SR) with different types of depression: inhibited, agitated, phobic and somatic. In the structure of depression in patients with SB, such symptoms as depressed mood, sleep disturbance, retardation of mental processes, feeling of helplessness and exhaustion, stress and anxiety, feeling of guilt, disorientation and disorganization of the psyche [3–5] prevail. We decided to consider the gender differences of the depressive component of dementia as the main predictor of SB in this pathology.

2. Purposes, subjects and methods:

2.1. Purpose – of our study is to consider the gender peculiarities of depressive symptoms in patients with high SR in different types of dementia and the formation of differentiated predictors of SB in men and women with this disorder.

2.2. Subjects & Methods. We analyzed gender differences in clinical and psychopathological status of patients with high risk of suicide in different clinical types of dementia (as a result of Alzheimer's disease, vascular and mixed types of the dementia process). Only the patients of the main group – with high suicidal risk according to the "Method of determining suicidal risk" > 23 points and clinical manifestations of SB (with the presence of suicidal thoughts, decisions, intentions, attempts, etc.) took part in the research. Thus, a group of patients with dementia due to Alzheimer's disease consisted of 36 patients (15 men, 21 women), a group of patients with vascular dementia – 39 patients (25 men, 14 women), 30 patients with mixed dementia (15 men, 15 women). The examination of patients was carried out at O. V. Spivak Sumy

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Table 1

*Gender characteristics of depressive symptoms in patients with Alzheimer's disease
(according to the Hamilton scale)*

Indicator	Men	Women	t-value	P	DC (diagnostic coefficient)	MI (measure of informativeness)
	M ± SD					
1	2	3	4	5	6	7
Depressive mood	1.71±0.27	1.79±0.35	0.161	–	-0.065	0.005
Feeling of guilt	1.3 ± 0.37	1.4 ± 0.14	0.239	–	-0.104	0.010
Suicidal intentions	3.04±0.34	2	3.068	p<0.01	0.607	0.636
Early insomnia	1.42±0.17	1± 0.18	1.690	–	0.515	0.220
Middle insomnia	1.42±0.17	1± 0.18	1.690	–	0.515	0.220
Late insomnia	1.23±0.16	0.17±0.22	1.89	–	2.830	3.012
Work and activity	3.61±0.17	3.78±0.11	0.79	–	-0.065	0.010
Inhibition	2.57±0.22	1.78±0.28	2.18	p<0.05	0.525	0.412
Excitement	2.23±0.32	2.35±0.42	0.222	–	-0.074	0.008
Mental anxiety	2.04±0.31	1.71±0.36	0.688	–	0.256	0.085
Somatic anxiety	1.23±0.21	1.78±0.35	1.328	–	-0.528	0.289
Main somatic violations	0.80±0.16	1.28±0.22	1.733	–	-0.667	0.311
General somatic symptoms	1.19±0.08	1.5 ±0.13	1.885	–	-0.333	0.103
Genital symptoms	0.85±0.22	1 ±0.27	0.409	–	-0.222	0.031
Hypochondria	0.90±0.27	1.071±0.3	0.371	–	-0.243	0.040
Weight loss	0.57±0.17	1 ±0.27	1.302	–	1.069	0.319
Weight loss (actual)	0.19±0.08	0.42±0.22	0.975	–	-1.169	0.278
Criticism	1.19±0.16	0.71±0.12	2.311	p<0.05	0.737	0.351
Daily fluctuations	0.19±0.08	1.57±0.22	5.66	p<0.001	-3.044	4.204
Daily fluctuations (degree)	0.19±0.08	1.28±0.22	4.612	p<0.001	-2.75	3.017
Depersonalization/de-realisation	1.71±0.35	0.85±0.27	1.894	–	1.0	0.857
Paranoid symptoms	0.57±0.11	1.28±0.22	3.637	p<0.01	-1.910	3.013
Obsessive and compulsive symptoms	0.57±0.17	0 ±0	3.230	p<0.01	0	0
Total score	32.2±1.22	31 ±2.71	0.407	–	-3.128	17.448

Regional Clinical Psychoneurological Health Center, Sumy Regional Clinical Hospital for War Veterans, Geriatric Boarding House, Sumy City Hospital No.4. All patients or their relatives agreed to participate in the study. The diagnosis was established in accordance with ICD-10, based on data from a clinical and neuroimaging study (MRI).

Our aim was to develop pathognomonic clinical and psychopathological diagnostic criteria for high suicide risk among men and women with different types of dementia basing on the distinguished gender peculiarities. To determine the differences in the formation of depressive symptoms in both groups we used Hamilton Depression Rating Scale (HDRS) (Hamilton M.,

1967), the method of statistical processing of the results using the degree of Kulbak's informative and diagnostic coefficients.

Conflict of interests. There is no conflict of interests.

3. Results and discussion. We conducted the detailed analysis of the components of depressive symptoms, as shown in the following tables.

The total score of depression according to Hamilton scale in the comparable groups was high and comprised (32.2 ± 1.22 points) among men and (31 ± 2.71) among women. As it can be seen from the Table 1 in men with dementia in Alzheimer's disease in the structure of depression

prevailed such symptoms as depressive mood (1.71 ± 0.27 points), suicidal intentions (3.04 ± 0.34 points), inability to perform work and to activity (3.61 ± 0.17 points), inhibition (2.57 ± 0.22 points), excitement (2.23 ± 0.32 points), mental anxiety (2.04 ± 0.31 points), decrease of criticism (1.19 ± 0.16 points). At the same time, men in comparison with women had a decrease in critical thinking ($p < 0.05$; $DC = 0.737$; $MI = 0.351$); the presence and severity of suicidal intentions ($p < 0.01$; $DC = 0.607$; $MI = 0.636$); inhibition of the pace of mental activity ($p < 0.05$;

$DC = 0.525$; $MI = 0.412$) as diagnostic significance in determining the risk of suicide.

Clinico-psychopathological states of depression in women with Alzheimer's disease included depressive mood (1.79 ± 0.35 points), decreased activity and productivity at work (3.78 ± 0.11 points), psychomotor agitation (2.35 ± 0.42 points), manifestations of somatic anxiety (flatulence, diarrhea, dry mouth, palpitation, headaches, increased sweating) (1.78 ± 0.35 points), gastrointestinal and general-somatic symptoms (loss of appetite, constipation, severity

Table 2

Gender characteristics of depressive symptoms in patients with vascular disorders (according to Hamilton scale)

Indicator	Men	Women	t-value	P	DC (diagnostic coefficient)	MI (measure of informativeness)
	M \pm SD					
1	2	3	4	5	6	7
Depressive mood	2 \pm 0.21	1.85 \pm 0.32	0.362	-	0.107	0.015
Feeling of guilt	1.6 \pm 0.23	1.21 \pm 0.21	1.204	-	0.397	0.153
Suicidal intentions	2.28 \pm 0.3	0.42 \pm 0.13	5.190	p < 0.001	2.411	4.464
Early insomnia	1.24 \pm 0.15	1.64 \pm 0.13	1.967	-	-0.405	0.163
Middle insomnia	1.36 \pm 0.16	1.35 \pm 0.22	0.010	-	0.003	8.686
Late insomnia	0.84 \pm 0.18	1.21 \pm 0.11	1.698	-	-0.531	0.198
Work and activity	3.64 \pm 0.09	2.71 \pm 0.41	2.187	p < 0.05	0.423	0.391
Inhibition	2.2 \pm 0.16	1.42 \pm 0.29	2.310	p < 0.05	0.623	0.480
Excitement	2.4 \pm 0.24	1.14 \pm 0.20	3.928	p < 0.001	1.070	1.345
Mental anxiety	1.92 \pm 0.25	1.07 \pm 0.30	2.125	p < 0.05	0.841	0.714
Somatic anxiety	2.24 \pm 0.21	1.42 \pm 0.13	3.230	p < 0.01	0.648	0.526
May somatic violations	0.72 \pm 0.12	0.42 \pm 0.13	1.582	-	0.748	0.218
General somatic symptoms	1.76 \pm 0.08	1.35 \pm 0.22	1.669	-	0.375	0.151
Genital symptoms	1.36 \pm 0.19	0.42 \pm 0.22	3.138	p < 0.01	1.665	1.551
Hypochondria	1.8 \pm 0.28	0.85 \pm 0.32	2.172	p < 0.05	1.070	1.00
Weight loss	0.48 \pm 0.14	0.71 \pm 0.19	0.972	-	-0.567	0.131
Weight loss (actual)	0.36 \pm 0.14	0.42 \pm 0.13	0.349	-	-0.251	0.017
Criticism	1.04 \pm 0.20	0 \pm 0	5.099	p < 0.001	0	0
Daily fluctuations	0.84 \pm 0.16	0.57 \pm 0.13	1.274	-	0.555	0.149
Daily fluctuations (degree)	0.84 \pm 0.18	1 \pm 0.18	0.611	-	-0.251	0.040
Depersonalization/de-realisation	0.56 \pm 0.20	1.07 \pm 0.35	1.254	-	-0.936	0.478
Paranoid symptoms	2 \pm 0.29	0 \pm 0	6.793	p < 0.001	0	0
Obsessive and compulsive symptoms	0.32 \pm 0.13	0 \pm 0	2.317	p < 0.05	0	0
Total score	33.8 \pm 2.30	22.35 \pm 1.88	3.846	p < 0.001	7.998	12.201

Table 3

*Gender peculiarities of depressive symptoms in patients with mixed disorders
(according to Hamilton scale)*

Indicator	Men (n=15)	Women (n=15)	t-value	P	DC (diagnostic coefficient)	MI (measure of infor- mativeness)
	M ± SD					
1	2	3	4	5	6	7
Depressive mood	1.4±0.21	2.73 ± 0.22	4.26	p<0.001	-0.963	1.281
Feeling of guilt	2.33±0.34	2.73 ± 0.22	0.96	–	-0.228	0.091
Suicidal intentions	1.33±0.41	2.73 ± 0.22	2.98	p<0.01	-1.037	1.452
Early insomnia	0.53±0.21	0.93 ± 0.22	1.275	–	-0.811	0.324
Middle insomnia	0.47±0.13	1.33 ± 0.18	3.77	p<0.001	-1.500	1.290
Late insomnia	0.53±0.19	0.8 ± 0.24	0.861	–	-0.594	0.160
Work and activity	3.2 ± 0.29	3.2 ± 0.22	0	–	–	–
Inhibition	2.13±0.37	2.53 ± 0.32	0.807	–	-0.24	0.097
Excitement	1.13±0.32	1.47 ± 0.37	0.673	–	-0.379	0.129
Mental anxiety	0.8± 0.17	1.87 ± 0.38	2.503	p<0.05	-1.22	1.310
Somatic anxiety	2.07±0.34	1.87 ± 0.25	0.466	–	0.146	0.029
May somatic viola- tions	1.07±0.26	0.67 ± 0.12	1.35	–	0.675	0.270
General somatic symptoms	1.47±0.21	1.27 ± 0.11	0.814	–	0.210	0.042
Genital symptoms	1.47±0.21	0± 0	6.812	p<0.001	–	–
Hypochondria	1.87±0.33	1.33 ± 0.31	1.151	–	0.491	0.265
Weight loss	1.07±0.20	0.27 ± 0.11	3.365	p<0.01	1.986	1.589
Weight loss (actual)	0 ± 0	0.13±0.09	1.467	–	–	–
Criticism	0.87±0.19	1.07 ± 0.24	0.637	–	-0.298	0.059
Daily fluctuations	0.87±0.23	0.8 ± 0.24	0.196	–	0.121	0.008
Daily fluctuations (degree)	1.07±0.26	0.93 ± 0.22	0.379	–	0.202	0.028
Depersonalization/dere- alisation	0.8 ± 0.24	0.26± 0.18	1.75	–	1.583	0.843
Paranoid symptoms	1.27±0.38	1.47± 0.40	0.360	–	-0.210	0.042
Obsessive and compulsive symptoms	0.34±0.12	0.13± 0.09	1.287	–	1.387	0.291
Total score	28.06±2.1	30.53±2.14	0.817	–	-0.691	9.608

in limbs, muscle aches, lack of vital forces) (1.28 ± 0.22 and 1.5 ± 0.13 points, respectively). Women were more likely to lose weight (1 ± 0.27 points), had diurnal mood fluctuations (1.57 ± 0.22 points) in a marked degree (1.28 ± 0.22 points), and had delusions (1.28 ± 0.22 points).

The significant differences were found between two groups, which consisted in the prevalence of daily mood fluctuation in women ($p < 0.001$; DC = -3.044; MI = 4.204) and their severity ($p < 0.00$; DC = -2.754; MI = 3.017); paranoid symptoms ($p < 0.01$; DK = -1.910; MI = 3.013) compared with men.

Assessment of clinical and psychopathological structure of depressive syndrome as a part of

vascular dementia among men showed a severe degree of depression (33.8 ± 2.30 points), and moderate in women (22.35 ± 1.88), while the accuracy of the differences corresponded to the level ($p < 0.001$). Men with a high risk of suicide in the vascular form of the dementia were more vulnerable than women as to the development of comorbid depressive symptoms (DC = 7.998; MI = 12.201), with marked depressive mood (2 ± 0.21 points), suicidal intentions (2.28 ± 0.3 points) showed the inability to perform activities and work (3.64 ± 0.09 points), torpidity of thinking (2.2 ± 0.16), mental and somatic anxiety (1.92 ± 0.25 and 2.24 ± 0.21), psychomotor agitation (2.4 ± 0.24 points), delusions (2 ± 0.29 points), sexual

function disorders (1.36 ± 0.19 points) and decreased critical thinking abilities (1.04 ± 0.20 points).

Thus, assessment of depressive symptoms in patients with vascular dementia allowed to determine that the high levels of depression (DC = 7.998; MI = 12.201), suicidal intentions ($p < 0.001$; DC = 2.411; MI = 4.464); inability to perform work ($p < 0.05$; DC = 0.423; MI = 0.391); inhibition of thinking ($p < 0.05$; DC = 0.623; MI = 0.480); mental ($p < 0.05$; DC = 0.841; MI = 0.714) and somatic anxiety ($p < 0.01$; DC = 0.648; MI = 0.526); predisposition to hypochondria ($p < 0.05$; DC = 1.070; MI = 1.00); genital symptoms ($p < 0.01$; DC = 1.665; MI = 1.551) prevailed among men with high SR.

Moderate severity of depression and its components are the marker of high suicide risk for women with vascular dementia ($p < 0.001$; DC = 7.998; MI = 12.201).

Gender characteristics of depressive symptoms in patients with mixed dementia (due to aggregation of the vascular and neurodegenerative process) consisted in prevalence of deep depression among examined women (2.73 ± 0.22 points) with a feeling of guilt and suicidal intentions (2.73 ± 0.22 points, respectively), frequent wakening at night (1.33 ± 0.18 points), decrease of real time of daily activity (3.2 ± 0.22 points), ideational retardation (2.53 ± 0.32 points), moderately expressed mental and somatic anxiety (1.87 ± 0.38 points).

The peculiarities of depressive syndrome in a mixed type of dementia in men consisted in a moderate mood decrease (1.4 ± 0.21 points), mental anxiety (0.8 ± 0.17 points), suicidal manifestations in the form of antivital mood (1.33 ± 0.41 points) and expressed feelings of guilt (2.33 ± 0.34 points), retardation (2.13 ± 0.37 points), somatic anxiety (2.07 ± 0.44), predisposition to hypochondria (1.87 ± 0.33 points).

On the basis of statistical analysis, the significant differences between two comparable groups were established, which consisted in the prevalence of depressive mood in women ($p < 0.001$; DC = -0.963; MI = 1.281) secondary

to severe anxiety ($p < 0.05$; DC = -1.22; MI = 1.31); suicidal intentions ($p < 0.01$; DC = -1.037; MI = 1.452); with frequent wakening at night ($p < 0.001$; DC = -1.500; MI = 1.290).

Instead, in men secondary to subdepressive mood ($p < 0.001$; DC = -0.963; MI = 1.281) and suicidal manifestations in the form of antivital expressions ($p < 0.01$; DC = -1.037; MI = 1.452) disturbance of sexual function ($p < 0.001$) and weight loss ($p < 0.01$; DC = 1.986; MI = 1.589) were of high severity.

Conclusions. Thus, the following features of depressive symptoms refer to the gender diagnostic informative criteria of high risk of suicide:

In dementia due to Alzheimer's disease:

– in men: expressed suicidal manifestations (DC = 0.607; MI = 0.636) and torpidity of mental processes (DC = 0.525; MI = 0.412) secondary to lack of critical thinking relating to his condition (DC = 0.737; MI = 0.351);

– in women: daily mood fluctuations ($p < 0.001$; DC = -3.044; MI = 4.204) and their severity (DC = -2.754; MI = 3.017); paranoid symptoms (DC = -1.910; MI = 3.013).

In vascular dementia:

– in men: high level of depression (DC = 7.998; MI = 12.201); suicidal intentions (DC = 2.411; MI = 4.464); inability to perform work (DC = 0.423; MI = 0.391); torpidity of thinking (DC = 0.623; MI = 0.480); mental (DC = 0.841; MI = 0.714) and somatic anxiety (DC = 0.648; MI = 0.526); predisposition to hypochondria (DC = 1.070; MI = 1.00); genital symptoms (DC = 1.665; MI = 1.551);

– in women: mild and moderate severity of depressive syndrome and its components (DC = 7.998; MI = 12.201).

In mixed dementia:

– in men: mild depression (DC = -0.963; MI = 1.281) and weight loss (DC = 1.986; MI = 1.589);

– in women: severe depression (DC = -0.963; MI = 1.281); anxiety (DC = -1.22; MI = 1.31); suicidal intentions (DC = -1.037; MI = 1.452); frequent wakening at night ($p < 0.001$; DC = -1.500; MI = 1.290).

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CLINICAL PHENOMENOLOGY OF ADAPTATION DISORDERS IN PEOPLE WITH COMPUTER DEPENDENCY

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Summary. The purpose of the study comprehensive study of clinical-psychopathological and pathopsychological peculiarities of adaptation disorders in persons with computer dependence. Materials and methods. 147 patients with adaptive disorders (F43.21, F43.22). The main group consisted of 85 patients with signs of computer dependence according to the results of AUDIT-like tests, the control group included 62 patients without signs of addictive behavior. The average age of the examined people was $27,0 \pm 3,0$ years. Clinical-psychopathological, clinical-anamnestic pathopsychological, psychodiagnostic and statistical methods were used. The results of the study. The structure of computer dependence in the surveyed people of the main group consisted of obsessive surfing (46.2%); computer games (22.3%); virtual dating (6.4%); passion for online gambling (13.7%); cybersex (1.4%). In clinical adaptation disorders, people with computer dependence are dominated by reduced mood; internal stress with inability to relax; increased susceptibility to previously neutral stimuli; irritability; asthenic symptoms; loss of interest in work or study, family and friends; violation of the sleep-wake cycle. According to the psychodiagnostic survey data, the examined people of the main group are characterized by anxiety and depression manifestations by the Hospital scale; severe depressive and anxiety episodes by the Hamilton scale; high levels of situational and personal anxiety by the method of Ch. D. Spielberger, high level of expressiveness of the psychological stress by the scale of T. A. Nemchin. Conclusions. The clinical image of adaptation disorders in persons with computer dependence is characterized by reduced mood background; predilection, predisposition to affectus; alarming manifestations; hyperesthesia; violation of the sleep-wake cycle; clinical manifestations of anxiety and depression by the HADS scale; heavy depressive and anxious episodes by the HDRS scale; high levels of situational and personality anxiety; excessive psychological stress. **Key words:** *adaptation disorders, computer dependence, anxiety, depression, psychological stress, asthenia.*

Introduction. The situation in Ukraine has recently been characterized by continuously increasing demands and psychological pressure on the population due to the effect of various mass psychogenic factors, which leads to human maladaptation in the conditions of the social crisis and the spread of behavioral disorders, first of all, illnesses of dependence [1–3].

The situation associated with addictive behavior is quite problematic for many countries in the world, including Ukraine. The reason is the radical difference between the stereotypes of thinking and the outlook of successive generations

brought up in different socio-economic conditions, as well as through a protracted political, economic and social crisis [4, 5].

The medical and psychological preconditions affecting the growth of the number of persons with addictive behavior are exacerbated by the informational, technical and economic globalization and significant deformation of socio-economic relations, the formation of a prolonged stressful situation in society during the period of the global crisis. The results of scientific research show a fairly large prevalence chemical addiction associated with non-chemical one (tobacco use, alcohol consumption, etc.) with a wide range of polymorphic clinical manifestations [6, 7].

It is noted that comorbid psychiatric disorders (affective, stressful, personality) are found in 80% of patients and more. Addictive behavior in young people is of particular concern in society [8, 9].

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Without access to the field of vision of specialists (psychiatrists, narcologists, psychotherapists) in the early stages of the disease, patients with neurotic disorders and addictions seek specialized assistance in situations of chronic, relapse, complications, the formation of temporary and permanent disability, delictual and suicidal behavior that contributes to the violation of social functioning, the quality of life of the patient and his micro-social environment [10–13].

The foregoing stipulated the relevance and necessity of this study.

2. Purposes, subjects and methods:

2.1. Purpose a comprehensive study of clinical-psychopathological and pathopsychological features of adaptation disorders in people with computer dependence.

2.2. Subjects & Methods for achievement of the set purpose with observance of principles of bioethics and deontology during 2016–2018 on the basis of Kharkov Regional Clinical Psychiatric Hospital No. 3 and in the Military Medical Clinical Center of the Northern region, the complex examination of 147 patients with adaptive disorders was performed (F43.21, F43.22).

The main group consisted of 85 patients with signs of computer dependence according to the results of AUDIT-like tests, the control group included 62 patients with no signs of addictive behavior. Among the surveyed main group, 43.5% were women and 56.5% were men, among patients in the control group, these figures were 53.2% and 46.7% respectively.

The average age of the examined people of the main group amounted to 27.0 ± 3.0 years, the control group – 27.1 ± 3.0 years.

In this work, clinical-psychopathological, clinical-anamnestic patho-psychological, psychodiagnostic and statistical methods of research were used.

Conflict of interests. There is no conflict of interests.

3. Results and discussion. The structure of computer dependence in the examined people of the main group consisted of obsessive surfing (Internet surfing, search for information on databases and search sites) – 45.8% of the surveyed, $22.3 \pm 1.2\%$ computer games; $5.8 \pm 0.4\%$ virtual dating; 14.1% passion for online gambling; 1.2% cybersex (using porn sites).

As the results of the clinical anamnestic study showed, the duration of the addition in the examined people is the following: up to one year – 45.8%, 1–3 years – 36.4%, more than 3 years – 17.6%.

In the clinical picture of the adaptation violations in the examined patients, there was decreased mood (72.9% of the examined people of the main group and 74.1% of the control group); perversity, unbalance, propensity for short-term violent reactions (52.7% and 38.7% of the examined patients respectively); a feeling of anxiety, internal tension with the inability to relax (69.4% of the surveyed of the main group and 51.6% of the control group); increased vulnerability, susceptibility (32.9% and 35.4%); confusion (55.3% of the examined people of the main group and 53.2% of the control group); sensitization to external stimuli, especially during sleep and hibernation (78.8% and 74.1% respectively); asthenic symptom (84.7% and 82.3% respectively), increased weakness and fatigue under physical stress (49.1% and 54.2% respectively).

Based on clinical and psychopathological data, the following variants of adaptation disorders were identified: anxiety (47.1% of the examined people of the main group and 40.4% of the control group), neurasthenic (39.9% and 40.1% respectively), asthenic-apatetic (9.7% and 11.4%) and melancholic (3.3% and 8.1% respectively).

Regarding the data of the psychodiagnostic study for the examined patients, the clinical manifestations of anxiety and depression on the HADS scale – 71.7% of the examined people of the main group and 66.1% of the control group; severe depression (48.2% of the main group and 40.3% of the control group) and anxiety (54.1% and 43.5% respectively) on the HDRS scale; high levels of situational anxiety (44.7% of the surveyed people of the main group and 40.3% of the control group) and personal anxiety (52.9% and 50.0% respectively); excessive nervous-psychic tension (70.5% of the main group and 66.1% of the control group).

For the clinical picture of the adaptation disorders in the examined patients of the main group, vegetative-vascular paroxysms were obligatory, vegetative lability was also observed in the examined people of the control group, however, the expressed vascular crises were characteristic only for anxiety and neurasthenic variants of adaptation disorders.

For those with adaptive disorders, the most typical of the following personality traits are increased excitability and disequilibrium, proneness to conflict in relationships, vulnerability and maltreatment, lability of emotions, demonstration of emotional manifestations, anxiety, efficacy of behavior. At the same time,

for the surveyed people of the main group in the situation of impossibility of using the Internet, there were affective reactions in the form of bursts of rage, vulnerability, demonstrability, threats and image.

Conclusions. Thus, according to the results of the study, in clinical disorders of adaptation in people with computer dependence mood depression; internal tension with inability to relax; increased susceptibility to previously neutral stimuli; irritability; asthenic symptoms; loss of

interest in work or study, family and friends; violation of the sleep-wake cycle are dominated.

The study of the features of the relationship and the interaction of addictions and neurotic pathology is important for the practical work of psychiatrists, narcologists and general practitioners as it allows differentially predict the possibility of occurrence and the degree of gravity of emotional disorders and adaptation disorders to determine the optimal scheme for their correction and prevention.

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PECULIARITIES OF SENSATION, PERCEPTION AND EMOTIONAL FUNCTIONING DISORDERS IN PATIENTS WITH SCHIZOPHRENIA AND OBESITY

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Abstract. The article presents the results of clinical and psychopathological study of the presence and peculiarities of emotional disturbances, perception and functioning of the emotional sphere in patients with schizophrenia and obesity. The study involved examination of 44 patients previously diagnosed with schizophrenia and obesity in a comparative aspect with patients with schizophrenia but without obesity and other concomitant somatic pathology (50 patients). It has been established that the combination of obesity with schizophrenia is characterized by a certain specific sensation disorder, perception and emotional functioning, manifested by the presence in the clinical picture of schizophrenia senestopathy and complex hallucinations (which along with auditory and visual hallucinations also include visceral hallucinations and hallucinations of the skin sensation), rigidity of emotional reactions, the presence of distinct emotional disturbances of the depressive spectrum and dysphoric mood disorders.

Key words: *schizophrenia, obesity, sensation and perception, emotional disturbances.*

Introduction. Excessive body weight and obesity in patients with mental disorders is a complex problem of modern psychiatry. Especially often overweight is registered in patients with schizophrenia, which according to clinical studies is observed in more than 60% of patients [5]. The reasons for the high prevalence of obesity among schizophrenia patients are seen in the features of the disease itself, including the decrease in physical activity due to prolonged hospitalizations, negative symptoms, the decline in the social and economic status of patients, the peculiarity of neurohumoral processes, carbohydrates metabolism, as well as the effects of prolonged antipsychotic therapy [1, 5, 6,10]. The specific danger of excessive weight is in increasing the risk of developing cardiovascular diseases, stroke and heart attacks, diabetes mellitus and cancer, which are the main causes of premature mortality of schizophrenic patients [2, 3, 8, 9]. In addition, obesity affects the self-esteem of patients, leads to stigma, a decrease in

social activity, and is one of the leading factors of stop or non-compliance in maintenance antipsychotic therapy.

Recently, special attention is paid to the factors and mechanisms of obesity formation in schizophrenic patients, the effects of psychotropic drugs on body weight are also actively studied, as well as large-scale biochemical studies of the carbohydrate-lipid metabolism of schizophrenia patients are being conducted, which prove that obesity and schizophrenia are closely interconnected with each other and can be both a precondition and outcome of each other [5, 7]. Taking into consideration that obesity is a multisystem disease, special attention should be paid to the issue of presence and specificity of clinical pathomorphism of manifestations of schizophrenia in case of its combination with obesity, which exactly predetermined the purpose of the proposed study.

2. Purposes, subjects and methods:

2.1. Purpose – to investigate the presence and peculiarities of emotional disturbances, perceptions and emotions disorders in the clinical structure of schizophrenic patients with obesity.

2.2. Subjects & Methods. Clinical and psychopathological examination using the clinical scale of positive and negative symptoms (Positive and Negative Syndrome Scale – PANSS) [4].

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The study involved 94 patients with schizophrenia (F20), of whom 44 schizophrenic patients with diagnosed obesity comprised the main study group, the control group included 50 schizophrenic patients without chronic somatic pathology.

Inclusion criteria in the study were as follows: the presence of a verified diagnosis of schizophrenia (F20) in accordance with ICD-10 criteria for a duration of at least 3 years; age of the patients from 18 to 60 years old; the ability of patients to participate in the study, adequately understand the requirements and instructions being presented in accordance with the research objectives and signed informed consent to participate in the study. Exclusion criteria were the presence of organic diseases of the central nervous system; moderate cognitive and psychopathological disorders that complicate the learning and performance of instructions; and in post-schizophrenic depression (F20.4).

The main group of the study was formed taking into account the presence of obesity in the patient (the body mass index (BMI) was ≥ 30). The criteria for patients of the control group were the absence of chronic somatic diseases and, in particular, absence of obesity.

In the main group of patients, the majority of individuals had the first degree of obesity (BMI = 30–35) – 25 persons (59.52%), the second degree of obesity (BMI = 35–40) was diagnosed in 13 persons (30.95%), and the third degree of obesity (BMI > 40) was observed in 4 persons (9.52%).

By gender and age, the patients of the research groups did not differ significantly, however, there was a tendency for larger amount of female subjects among patients in the main group (66.67%), compared with patients in the control group, where the number of female subjects was 52%. The average age of the observed patients in the main group of patients was 37.4 years, and in patients of the control group – 36.8 years.

Conflict of interests. There is no conflict of interests.

3. Results and discussion. Among the forms of schizophrenic disorder, paranoid schizophrenia predominated in both research groups: 62.4% of the patients in the main group and 78% of the patients in the control group. But it should be noted that other forms of schizophrenia were diagnosed more frequently in patients of the main group (38.6% of cases) than among patients in the control group – in 22%

of cases, at $\delta \leq 0.04$. However, data regarding the prevalence of specific forms of schizophrenia in obesity have not been revealed in this study. According to the type of schizophrenic disorder, statistical differences between the two study groups were not detected.

According to the results of the clinical examination, 81.2% of the patients in the main and 72% of the control group were diagnosed with sensation and perception disorders. The structure of the revealed disorders and their representation in the patients in the study groups is shown in *Figure 1*.

In the observed patients of both groups, hallucinations were the most common among sensory and perception disorders, which were revealed in 40.91% of patients in the main group and 44% of patients in the control group. At the same time, patients of the main group were significantly more often found to have senestopathy (36.36%), compared to patients of the control group (20%), with $p \leq 0.05$. The senestopathic sensations of the patients in the main group had a different localization, but more often they were located in the stomach (adhesion, dryness, sensation of gut pulsation, distortion, some kind of stir, pressure on internal organs, etc.), chest and head (in the form of pressure, tension, heartburn, transfusion, sticking, itching and moving in the brain, etc.) were described by the patients as unpleasant, difficult feelings, but mostly without painful interpretation, while the paroxysms were accompanied by anxiety, hypochondric delusional interpretation.

Instead of visceral hallucinations, the senestopathic sensations, despite the unusual and bizarre descriptions, were not clear and not specified. Often, senestopathic symptoms were combined in parallel with hallucinatory or sensation disorder in the form of hyperesthesia or hypesthesia.

According to the results of the research, there were no reliable differences in the representation and severity of hallucinatory behavior in patients of the studied groups. Thus, hallucinations in the structure of psychotic symptoms were noted in 40.91% of patients in the main group and their severity on the PANSS scale was 3.8 ± 0.14 ; and in 44% of patients in the control group with severity of 3.42 ± 0.18 . At the same time, in the structure of detected hallucinations in the two studied groups it was revealed, that in patients of the main group by the level of complexity complicated (complex) hallucinations were more commonly revealed, including several analyzers

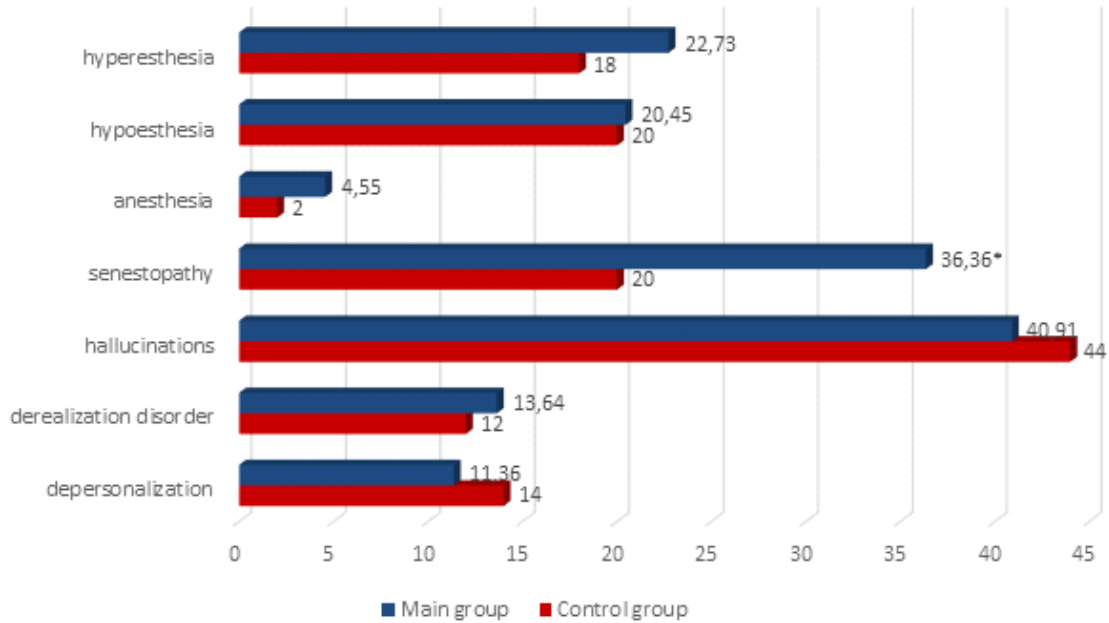


Fig. 1. Disorder of sensations and perception in the examined patients
*Notes: statistically significant probability indices are indicated by * (p≤0.05)*

simultaneously (67% of the total number of patients with hallucinations per group), which in proportions to simple hallucinations were 3:1, while the same proportion in patients of the control group was 1.5:1 (fig. 2).

The structure of hallucinations of the patients in the main group by analyzers was presented more diverse, among the most commonly detected were auditory (27%), visceral (22%), skin sensation (16%) and visual (16%) hallucinations (fig. 3). In the same hallucinations structure of the control group, the auditory (49%) and visual (21%) hallucinations were significantly superior.

According to the type of projection in the hallucination structure of patients of both research groups, no differences were noted between the compared groups, in the hallucinatory disorders of patients of both groups, the prevalence of true hallucinations was observed (67% of the total number of patients in the main group with hallucinations and 64% of the total number of patients in the control group with hallucinations) over the false hallucinations (33% and 36%, respectively) (fig. 4).

Overall, assessment of sensation and perception disorders in the clinical picture of

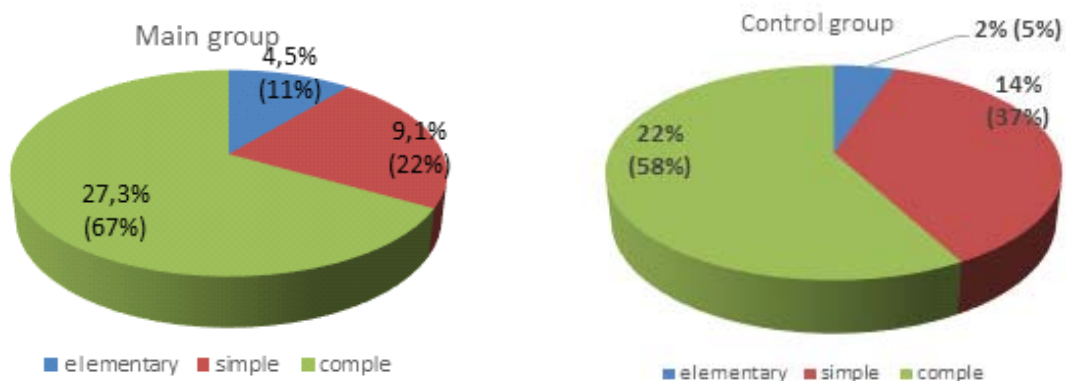


Fig. 2. Structure of detected hallucinations by degree of complexity in patients in study groups
Notes: data are presented in the format: percentage of the total number of patients examined by the study group and in brackets – the proportion of the number of patients with hallucinations in the clinical picture

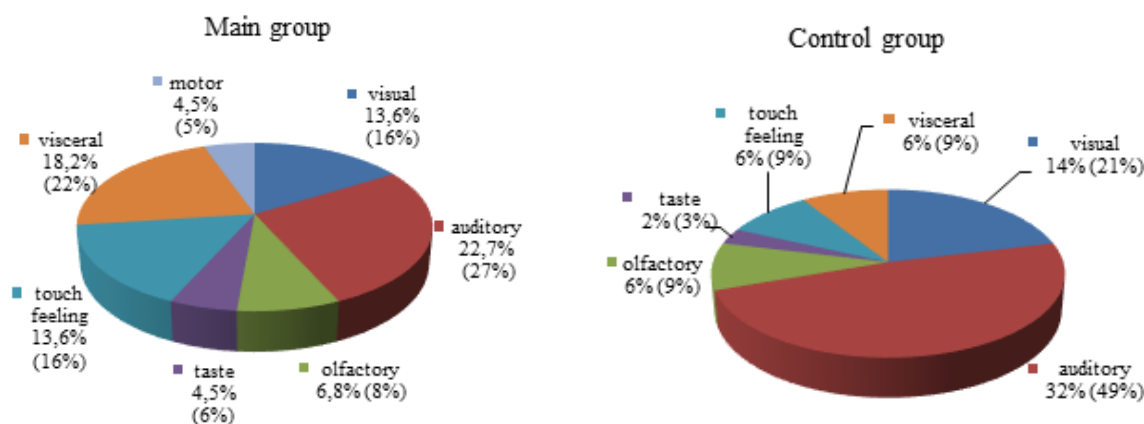


Fig. 3. The structure of detected hallucinations by analyzers in patients in study groups
Notes: data are presented in the format: percentage of the total number of patients examined by the study group and in brackets – the proportion of the number of patients with hallucinations in the clinical picture

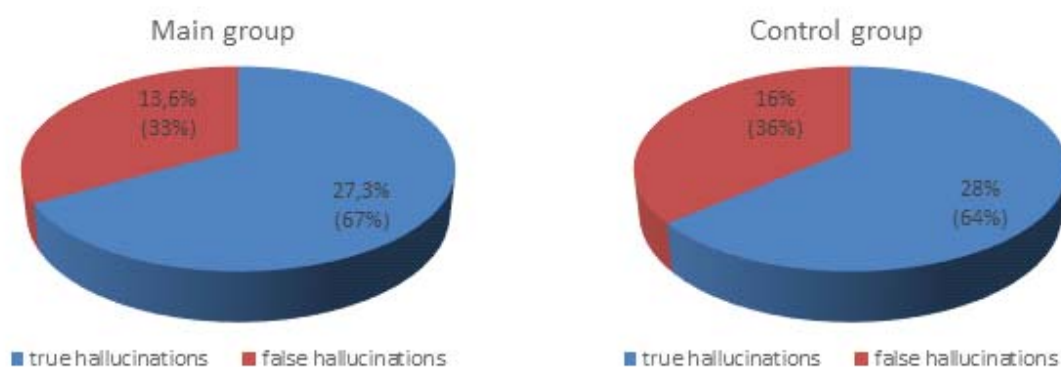


Fig. 4. Structure of detected hallucinations by type of projection (perception mechanism) in patients in study groups
Notes: data are presented in the format: percentage of the total number of patients examined by the study group and in brackets – the proportion of the number of patients with hallucinations in the clinical picture

schizophrenia in obese patients showed more cases of senestopathy and complicated hallucinations, among which, in addition to auditory and visual hallucinations, visceral hallucinations and hallucinations of the sensory perception more often were detected.

Emotional disorders in the form of disorders of emotional reactions and mood disorders were detected in 100% of the patients who participated in the study. The pathology of emotional reactions in patients of both groups in the overwhelming majority was represented by deficiency (flattening) of emotions, which was observed in 38.64% of obese patients and in 42% of patients in the control group and was represented by emotional decline, impoverishment of emotional sensations and manifestations (*fig. 5*). In this case, the emotional reactions of patients with obesity were characterized by the prevalence of

emotion rigidity (29.55%) and a significantly lower representation of lability (9.09%), compared to the control group (24%), at $p \leq 0.05$. Patients of control group were characterized, along with the flattening of emotions, by a much more frequent representation of emotional lability, which was manifested by the easy occurrence and the frequent change of opposite emotions.

In the structure of mood disorders of patients in the main group, hypothyria (state of reduced mood with a feeling of anxiety, hopelessness, helplessness, depression, sadness) (45.45%), anxiety (29.55%) and dysphoria (29.55%), the latter in obese patients was markedly more frequent, compared with the control group (14%), with $p \leq 0.05$ (*fig. 6*). In the patients of the control group, anxiety (40%) and hypothyria (38%) prevailed in the structure of mood disorders.

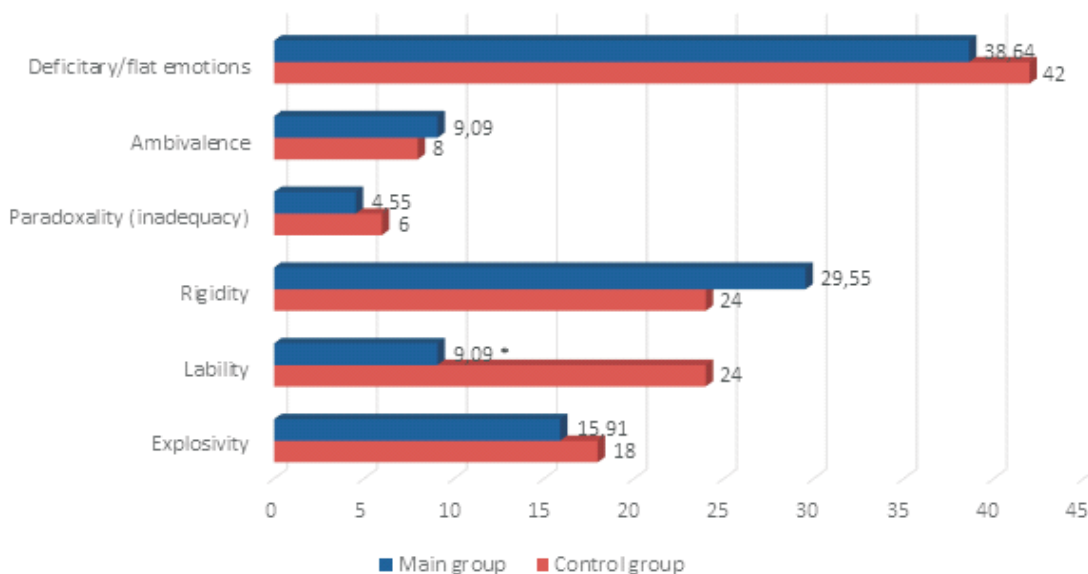


Fig. 5. Disorders of emotional reactions of patients with schizophrenia by the study groups
*Symbols: *statistically significant differences $p \leq 0.05$*

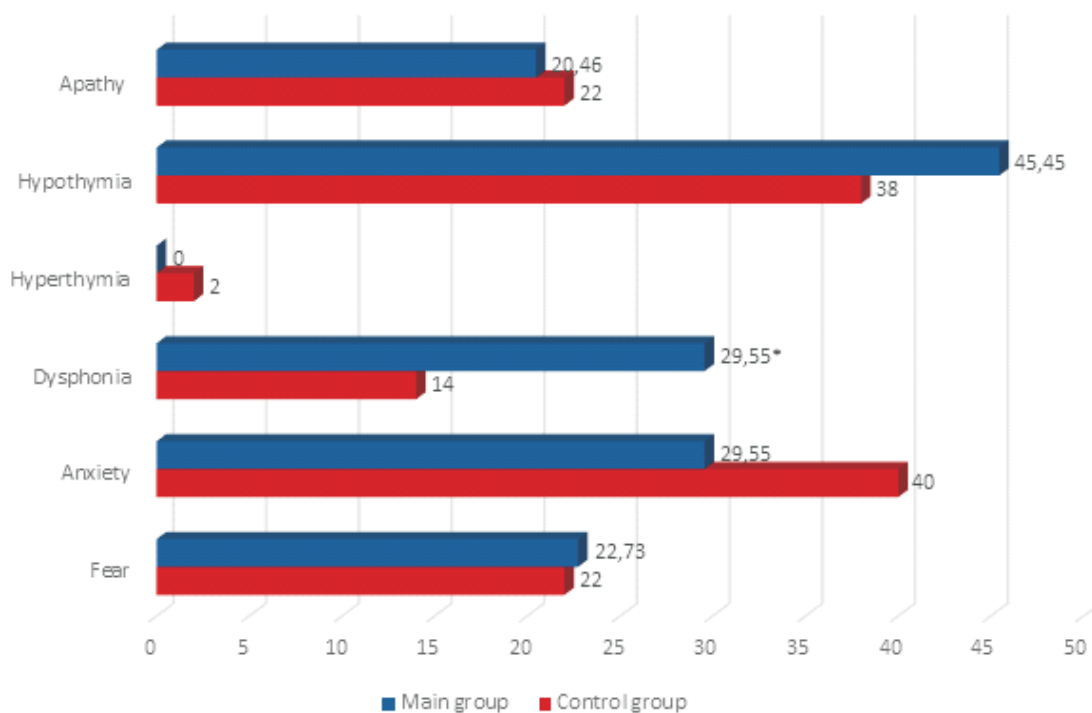


Fig. 6. Mood disorders in patients with schizophrenia by the study groups
*Symbols: *statistically significant differences $p \leq 0.05$*

For the quantitative assessment of the severity of emotional disturbances, the results of the research by the PANSS scale were used, assessing the scales which reflect the peculiarities of functioning in the emotional-will area of patients (table). Disturbances in the emotional-will sphere are represented by subscales that outline the negative (N) and general psychopathological symptoms (G) of PANSS scale.

Among the negative symptoms which determine the emotional functioning in patients with obesity more prevalent emotional withdrawal (3.24 ± 0.17) was observed in comparison with the control group (2.56 ± 0.12), at $p \leq 0.05$, that were represented with decrease in interest, emotional inclusion and affective participation in life events. Among general psychopathological symptoms (G) in patients with

*Severity of disturbances in the emotional and motivational sphere of patients
of research groups according to the results of the PANSS scale*

Disturbances in the emotional and motivational sphere	Main group n=44	Control group n=50
	M± m	M± m
1	2	3
N1 Blunted affect	2.46±0.14	2.68±0.12
N2 Emotional withdrawal	3.24±0.17*	2.56±0.12
G2 Anxiety	2.76±0.16	2.95±0.18
G4 Inner tension	2.1±0.16	2.4±0.14
G6 Depression	3.65±0.16*	2.56±0.14
G13 Disturbance of volition	2.25±0.12	1.86±0.14
G14 Poor impulse control	1.95±0.14	1.7±0.12

Notes:

- statistically significant indices of probability are indicated as follows: * $p < 0.05$;
- the data is presented in the following format: arithmetic mean ± error of the arithmetic mean ($M \pm m$)

the main group, depressive symptoms were significantly higher (3.65 ± 0.16), compared to the patient from the control group (2.56 ± 0.14), with $p \leq 0.05$. Therefore, in spite of the fact that hypothymic mood disorders in obese patients were not represented more often than in patients of the control group, meanwhile, their expressiveness and ability to lead to the depressive state were significantly higher in patients with obesity. In general, the emotional functioning of obese patients was characterized by depressive manifestations and dysphoric mood disorders, combined with emotional withdrawal (reduced or absent emotional interest in events and environments).

Thus, the data of the conducted research indicate that the combination of obesity with

schizophrenia is characterized by certain features and specificity of the pathology of sensation and perception, which are manifested in the clinical picture of schizophrenia by the presence of senestopathy and mainly complex hallucinations (which along with auditory and visual include also visceral hallucinations and hallucinations of skin sensation). Emotional functioning of schizophrenic patients with obesity is characterized by rigidity of emotional reactions, the presence of distinct emotional disturbances of the depressive spectrum and dysphoric mood disorders.

The mentioned above reflects the specifics of the clinical design of schizophrenia in the case of its comorbidity with obesity, which should become useful in the development of diagnostic and therapeutic measures.

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