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COMPARATIVE CHARACTERISTICS OF THE PHYSICOMECHANICAL PROPERTIES OF SELF-ETCHING SELF-ADHESIVE CEMENTS FOR INDIRECT RESTORATIONS

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Annotation. In a comparative aspect, a study was made of the physicomechanical properties of composite cements for indirect restoration. It was found that in terms of adhesive strength of bonding with hard tissues, Maxcem Elite turned out to be the

undisputed leader, which by average measurements exceeds Bifix by 37.2% and Relyx by 30%, and the significance level of the advantage is very high ($P < 0.001$). The peel strength looked approximately the same for the "Maxcem Elite" (5.32 ± 0.27) MPa and Relyx (5.0 ± 0.25) MPa and was 13.6% better with respect to Bifix. Therefore, the advantage of "Maxcem Elite" in relation to Relyx can be affirmed at a satisfactory significance level of $p < 0.01$. A high level of adhesion strength to tooth hard tissues and peel strength ensures reliability and durability of the enamel-composite-metal system. The high strength of the connection with the hard tissues of the tooth, which is 1.6 times higher than the requirements, combined with a high level of tensile strength, which is 1.52 times higher than the requirements, allows you to get a reliable fixation with the metal surface, which is a necessary condition when using this type of prosthetics. The large value of the hardening depth (4.6 mm) expands the possibilities of using bridges with metal frames due to the full polymerization due to double fixation and mechanical retention.

Key words: bridge, self-etching self-adhesive cements, double-fixation cements, X-ray contrast, adhesive strength, peel strength.

Introduction. Recently, thanks to the rapid development of materials science and innovative technologies in dentistry, adhesive bridges are widely used to restore the integrity of the dentition with small included defects, combining exceptional aesthetics, sufficiently high wear resistance, a gentle approach to abutment teeth, production speed and, according to the direct method, independence from the dental laboratory [1, 2, 3, 6]. Modern methods for the manufacture of these prostheses provide for the preparation of abutment teeth, which is significantly different in volume from that in the case of traditional bridges and restoration of a missing tooth using photocomposite materials reinforced with fiberglass elements, which are enclosed in prepared cavities in abutment teeth adjacent to the defect [7]. However, as practical application shows, in functional terms, these constructions are slightly inferior to traditional bridges [6]. The reason for this is the insufficient area of the fixing elements or their irrational arrangement [12, 14].

One of the conditions for the long-term operation of these structures is their high strength and resistance to wear. To ensure such characteristics, it is necessary to plan the design of prostheses and rationally calculate the distribution of loads [4, 5, 8]. Despite a series of studies in this direction, there are many unresolved issues regarding the formation of cavities in abutment teeth and fixation of the construction of adhesive bridges. These disadvantages can certainly be eliminated by introducing and improving new designs of fixed prostheses, as well as by using new materials for their fixation [10, 15].

Objective. To carry out a comparative analysis of self-etching, self-adhesive double-fixation cements for indirect restorations in terms of physical and mechanical properties.

Material and methods. For comparison, in terms of physical and mechanical parameters, a self-etching self-adhesive composite cement for indirect restorations "Maxcem Elite", Kerr, California, USA was taken. "Maxcem Elite" refers to self-etching self-adhesive composite cements of double fixation, which have a number of positive qualities, such as high physical and mechanical properties, good aesthetic properties, radiopacity [9, 13].

To comprehensively check the positive characteristics of the self-etching self-adhesive composite cement for indirect restorations "Maxcem Elite", Kerr, California, USA, we examined its analogues "Bifix QV", VOCO, Cuxhaven, Germany, "Relyx U 100", 3M ESPE, Minnesota, USA. We analyzed the following physical and mechanical

parameters: the appearance of the paste, depth of hardening, mm, diametric strength, MPa, conical yield point according to Heppler, MPa, hardness according to Heppler, MPa, water absorption in 7 days, $\mu\text{g} / \text{mm}^3$, water solubility in 7 days $\mu\text{g} / \text{mm}^3$, adhesive strength, MPa, peel strength, MPa. The arithmetic mean of ten tests was taken as the test result with an accuracy of 0.1 MPa, if the difference between them did not exceed 5%. Our use of parametric and nonparametric methods of mathematical statistics allowed us to obtain reliable results.

Results and discussion. As shown by the results of the study (table 1), all materials during the tests showed themselves as highly viscous, homogeneous pastes, in which there are no foreign impurities and inclusions. If the average value of a certain indicator for material with number k is equal to P_k , then the index I_k relative to the best average value is defined as (1.1) depending on whether the quality of the material directly depends on this indicator, or it falls with an increase in the indicator.

$$I_k = P_k / \min P_i \quad \text{або} \quad I_k = \min P_i / P_k \quad (1.1)$$

Table 1.

Summary table of the main physical and mechanical parameters of the light-curing materials "Maxcem Elite TM" and its analogues

No	Indicator and its designations, units of measurement, clarification	Average and standard deviation for material		
		"Maxcem Elite TM», Kerr, California, USA	Bifix QV», VOCO, Cuxhaven, Germany	Relyx U 100», 3M ESPE, Minnesota, USA
	The appearance of the paste is highly	Viscous, homogeneous	Viscous, homogeneous	Viscous, homogeneous
	Depth of hardening, mm, not less (H)	4,62±0,25*	5,4±	5,3±
	Diametral strength, MPa (D)	47,34±2,64*	44,1±	44,0±
	Heppler conical yield point, MPa, not less (C)	1514,72±80,3*	1476,5±	1489,3±
	Heppler hardness, MPa, not less (S)	784,66±42,3	732,6±	756±
	Water absorption in 7 days, $\mu\text{g} / \text{mm}^3$, not more (W)	7,34±0,32	7,6±	7,2±
	Water solubility in 7 days $\mu\text{g} / \text{mm}^3$, not more (U)	4,23±0,17*	3,2±	3,1±
	Adhesive strength, MPa, not less (A)	17,31±0,54*	7,1±	7,92±
	Peel strength, MPa, not less (R)	5,32±	4,6±	5,0±

*- significant difference ($p < 0.05$) "Maxcem Elite TM" in comparison with the best analogue.

So, we see that according to the average test depth of hardening (mm) material "Maxcem Elite" is inferior to others: material Bifix by 14.9% and Relyx by 13.3%. This does not significantly affect the quality of the connection of the adhesive structure with the hard tissues of the tooth, especially due to the method we have developed for the preparation of abutment teeth in the manufacture of adhesive pads. On the other hand, according to the average value of the index of diametrical strength (MPa), the studied material "Maxcem Elite" is 17.2% better than Bifix, and 17.3% better than Relyx [11].

Comparing these and other physical and mechanical properties of materials on average, one must bear in mind the random nature of these values. From (table 2) it can be seen that the difference between the indicators of the material "Maxcem Elite" and analogs is confirmed at a very high level of significance.

Therefore, the level of reliability of these comparisons can only be asserted by conducting an appropriate statistical analysis. None of the samples that were analyzed was a sample with a normally distributed general population (according to the Kolmogorov-Smirnov test), therefore, in our calculations, we used the methods of nonparametric statistics.

Table 2.

Results of statistical analysis of comparisons of physical and mechanical properties of the material "Maxcem Elite TM" and its analogues by the Mann-Whitney test

Indicators	Significance level p
H Maxcem Elite ra HRelyx (versus smallest value)	2,6Ч
D Maxcem Elite ra DBifix (compared to the best value)	7,0Ч
C Maxcem Elite ra CRelyx (compared to the best value)	0,0011
S Maxcem Elite ra SRelyx (compared to the best value)	9,2Ч
A Maxcem Elite ra ARelyx (compared to the best value)	1,110-13
C Maxcem Elite ra CRelyx (compared to the best value)	0,0011
R Maxcem Elite ra RRelyx (compared to the best value)	0,013

The results obtained relate to all comparisons of the material "Maxcem Elite" according to the indicators included in table 2. For example, we came to the conclusion (see table 1) about a high reliable advantage in terms of Heppler conical yield point over the best of comparable materials Relyx U 100 ($C = 1489.3 \pm 74.5$ MPa). Since it is the best, the preference of the material "Maxcem Elite" over others can be asserted in no way at a lower level of reliability. Comparing the indicators of water absorption, water solubility and peel strength, the situation was the opposite [10].

The study of the level of water absorption indicates the probable absence of variability of the indicator of the studied material in comparison with comparable analogs. The value of the water solubility index of all the composites under study practically does not differ from the value of "Maxcem Elite" (within (2.5 ± 0.1) %), and correspond to the requirements of ISO 4046. These conclusions are also confirmed statistically, since none

of the applied criteria indicated for the presence of significant differences. Note that the last two indicators affect the stability of the glue line and the toxic effect on the human body.

Among the most important strength characteristics for fixing materials are the adhesive strength of the connection with the hard tissues of the tooth and the peel strength. In terms of adhesive strength of bonding to hard tissues, the undisputed leader was "Maxcem Elite", which, by comparison of average measurement values, surpasses Bifix by 37.2%, and Relyx by 30%, and, according to table. Level 2 benefit significance is very high ($P < 0.001$). Relative to the peel strength index, which was approximately the same for "Maxcem Elite" (5.32 ± 0.27) MPa and Relyx (5.0 ± 0.25) MPa and better by 13.6% with respect to Bifix. But, as can be seen from the table. 2, the advantage of "Maxcem Elite" in relation to Relyx can be asserted at a satisfactory level of significance $p < 0.01$.

The high level of adhesive strength of the connection with hard tissues of the tooth and the peel strength ensures the reliability and durability of the connection of the enamel-composite-metal system.

Thus, on the basis of laboratory tests and statistical analysis of their results, we substantiated the following conclusions.

Conclusions. The research results show that the investigated composite material "Maxcem Elite" in the main parameters corresponds to analogs, in most of the indicators it combines their best characteristics. In it, the adhesive strength of the connection with the hard tissues of the tooth is noticeably enhanced and the better peel strength makes it possible to profitably use this material "Maxcem Elite" for fixing the adhesive structures.

So, based on the results of a comprehensive comparative characteristic of the physical and mechanical properties of the composite materials under study, it can be concluded that this material can be offered for clinical use, namely, for fixing bridges, is the method of choice in the treatment of small included defects in the dentition in the frontal area. Film thickness index (μm) according to laboratory tests Relyx U100 and Bifix have a value lower than the standards recommended by ISO. "Maxcem Elite" correspond to the minimum limit of indicators, is (25.7 ± 2.9) microns.

The advantage of this type of polymerization is its reliability and allows the physician to thoroughly remove the excess fixative material already at the gel stage before the final photopolymerization. Its second advantage is that there is no adhesive in the composition, which reduces the likelihood of toxic manifestations from the pulp and periodontal tissues. Full color matching of "Maxcem Elite" material according to the Vita scale allows for prosthetics of bridges in the anterior part of the dentition without violating the norms of aesthetics.

So, "Maxcem Elite", a material that combines high viscosity of the polymer matrix, low dispersion of the filler, which provides it with high plasticity. This allows a thin layer of material to be obtained between the adhesive pad and the hard tissues of the tooth. High bond strength with hard tooth tissues, which is 1.6 times higher than the requirements, in combination with a high level of peel strength, which is 1.52 times higher than the requirements, allows you to obtain a reliable fixation with a metal surface, which is a prerequisite for using this type of prosthetics. The high value of the hardening depth (4.6 mm) expands the possibilities of using bridges with metal frameworks due to the full polymerization due to double fixation and mechanical retention.

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THE PRINCIPLE OF HUMANISM IN THE STATE-INDIVIDUAL RELATIONSHIP

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Annotation. The authors explore the principle of humanism as a fundamental principle of building a modern state by the rule of law. According to the results of the study claim - humanism, in our opinion, as a legal category, is a worldview that considers man as a higher, self-sufficient and self-aware value. Humanism expresses the attitude to man in at least two ways: recognizes the social value of the human person her assessment. Thus, humanism is a certain moral requirement for human behavior, is a certain category of moral awareness of man of the highest social value in the state.

Key words: humanism, principle of building a modern state, principle of law, the rule of law.

The term “principle” (*from the Latin - principium*) - the beginning, the basis. At the same time, the principle is what underlies a certain theory of science, the inner conviction of man, the basic rule of conduct [1, p. 547]. According to V. Dahl, the word “principle” means a scientific or moral principle, basis, rule, from which do not deviate [2, p. 431]. In legal doctrine, when defining the concept of principles of law, scholars use such categories as the initial theoretical provisions, basic, guiding principles (ideas), general regulations, guiding principles, patterns, essence, coordinate system and more. Many categories are homogeneous. Therefore, the principles are general, guiding (basic, main, starting, initial theoretical, general normative-guiding, guiding) provisions [3, p. 41].

Thus, the principles are a kind of indicators that demonstrate the degree of development of the law itself, starting points that show the vector of legal regulation. Of course, the principles of law should reflect and express the basic values on which the law is focused, to carry the basis of “ideal” law. The purpose of legal principles is to ensure the ideological unity of lawmaking, law enforcement and law and order in general. They permeate the entire legal system of society, focusing its development on universal, most valuable ideals: democracy, justice, equality, humanism, individual

¹ Slovník inšomovnykh slov; za red. O. S. Melnychuk. K., 1974. 1044 s.

² Tolkovi slovar zhyvoho velykorusskoho yazika. T. 3. / Dal V. Y. M.: Hos. yzd-vo ynostr. y nats. slov., 1955. 1110 s.

³ Starchuk O. V. Shchodo poniattia pryntsyypiv prava. Chasopys Kyivskoho universytetu prava. 2012. № 2. s. 40-43.

freedom, etc. [4, p. 44] Therefore, in historical terms, the principles precede the formation of a certain historical type of law. They serve as a kind of ideological plan, according to which the legislation is formed, the practice of its implementation is formed [5, p. 35-35].

The principles of law as an important element of law inherit this quality, in other words, the principles of law are inherent in the system. In this regard, the thesis that "the principles of law must be taken in the system" [6, p. 155]. Without systematicity, organic interconnection and interdependence of the principles of law, on the one hand, and their hierarchy and interdependence - on the other, it is impossible, or rather, it would be meaningless to talk not only about their effectiveness, but even about their social significance [7, p. 239]. Systematic principles of law, in the opinion of V. Kolisnichenko, means both the presence of relevant components and their relationship [8]. Thus, this property of the principles of law sets the task of their classification.

It should be noted that today there is no single list of principles of law, each author distinguishes his classification and adheres to his own opinion, but almost all scholars agree that the principles are objectively inherent in the law of quality.

Thus, in particular, V. Khropanyuk refers to the basic legal principles of social freedom, social justice, democracy, humanism, equality before the law, unity of legal rights and responsibilities, responsibility for guilt, legality [9, p. 215].

L. Yavich gave the most complete classification of the principles of law. There is a whole hierarchy of principles of law, in which there is a certain system and subordination. Legal principles and principles of law are constantly in dialectical development and formation. For example, the principles of the rule of law emerged long before the rule of law and only in the process of creating new legislation in Ukraine were reflected [10, p. 44].

Thus, the activities of the state should be aimed at ensuring respect for all established human rights and freedoms. So it is clear that all these legal axioms are designed to ensure individual rights and civil liberties. The fundamental principle of law, according to E. Trukhanov, should be recognized as the principle of humanism, which is a social ideal, according to which man - the key value of a democratic society, and the leitmotif and purpose of the legal system - to ensure its rights and freedoms. Humanism is a pervasive and most fundamental principle of law, which means the recognition of human value, respect for his dignity, the provision of the necessary conditions and opportunities for respect for his rights and freedoms, the pursuit of his good as the goal of social progress. It is on how this principle is implemented in law, how deeply its meaning is understood

⁴ Trukhanova, E. F. Zashchyta prav cheloveka pry provedenyy byomedytsynskykh yssledovanyi :teoretycheskyi aspekt : dySSERTatsiya na soyskanye uchenoi stepeny kandydata yurydycheskykh nauk. Spetsyalnost 12.00.01 - teoriya y ystoryia prava y hosudarstva ; ystoryia uchenyi o prave y hosudarstve. M., 2010. 243 s.

⁵ Voplenko N.P. Sushchnost, pryntsypy y funktsyy prava. Volhohrad, 1998. 288 s.

⁶ Явич Л. С. Общая теория права. Ленинград : Изд-во Ленинград, ун-та, 1976.

⁷ Керымов Д. А. Методологія права. Предмет, функції, проблеми філософії права. М., 2000. 410 с.

⁸ Kolisnichenko V.V. Suchasna yurydychna nauka pro klasyfikatsiiu pryntsypiv prava Yevropeiskoho soiuzu: krytychnyi analiz URL: <http://vuzlib.com/content/view/1522/92/>

⁹ Khropaniuk V.N. Teoriya hosudarstva y prava. M., 1995. 612 s.

¹⁰ Yavych L. S. Pravo rozvytoho sotsyalystycheskoho obshchestva: cushchnost y pryntsypy. M. 1978. 412 s.

by the public consciousness, depends on the further development of law and humanity as a whole [¹¹, p. 27].

Thus, in modern philosophical literature, humanism (*from the Latin - humanus - human*) is understood as a system of worldviews, the center of which is a person, his personality, high purpose and the right to free self-realization. Humanism determines the liberation of human capabilities, its well-being as a criterion for assessing social institutions, and humanity - the norm of relations between individuals, ethnic and social groups, states [¹², p. 134]. Humanism as a feature of world culture has enriched ethical thought by recognizing the self-worth of human and earthly life. Hence gradually developed the idea of happiness, justice and equality of people [¹³, p. 6].

There are many philosophical definitions of the concept of humanism. One of them defines humanism as the recognition of the value of the human person, his right to free development and manifestation of their abilities, the right to freedom and happiness, the assertion of the human good as a criterion for assessing social relations [¹⁴, p. 14].

Without aiming to study the history of the development of this phenomenon, let us just note that the most successful attempt to penetrate into its essence is a dialectical opposition to its antipode - antihumanism. Antihumanism is, first of all, the constraints that prevent the growth of creativity above the level that is considered in culture, in society. It takes the form of a ban on innovation, the proclamation of values, the inviolability of certain dogmas. The specific content of human history constantly contains different directions of people. The history of mankind can be seen as a history of the struggle between freedom and non-freedom, slavery, creativity - with its historical limitations. And the most important element of the content of the historical process is the struggle of humanism and antihumanism [¹⁵, p. 6].

In essence, writes S. Pogrebnyak, humanism is a worldview, at the center of which is the idea of man as the highest value, an ideology that focuses primarily on the positive of man in recognizing its negativity, which requires control and restrictions. In the most generalized form, humanism is a philosophical, ethical and natural-legal principle that gives a person the status of absolute value [¹⁶, p. 33]. At the same time, the scientist quoted by us rightly notes, the highest humanitarian principles, conditioned by the essence of society and the human desire for a high, dignified position, are realized primarily in the values of natural law. However, the researcher notes, humanism, along with freedom, justice and equality, is undoubtedly one of the basic principles of positive law. This must

¹¹ Trukhanova, E. F. Zashchyta prav cheloveka pry provedenyy byomedytsynskykh yssledovanyi :teoretycheskyi aspekt : dySSERTatsyia na soyskanye uchenoi stepeny kandydata yurydycheskykh nauk. Spetsyalnost 12.00.01 - teoryia y ystoriia prava y hosudarstva ; ystoriia uchenyi o prave y hosudarstve. M., 2010. 243 s.

¹² Filosofskyi entsyklopedychnyi slovnyk / V. I. Shynkaruk (holova redaktsii). K.: Abrys, 2002. 742 s.

¹³ Tseliev O. V. Humanizm ta pryntsyipy verkhovenstva prava na prykladi prava na hromadsku nepokoru. Naukovyi visnyk KhNU. 2009. № 2. S. 5-8.

¹⁴ Kostytskyi M. V. Humanizm prava yak proiav vyshchykh (kosmichnykh) zakoniv u suspilstvi. Pryntsyipy humanizmu ta verkhovenstva prava yak umova rozvytku demokratychnoi, sotsialnoi, pravovoi derzhavy (pamiati profesora V. V. Kopieichykova): Materialy mizhvuz. nauk.-teoret. konf. K.: Kyiv. nats. un-t vnutr. sprav, 2009. S. 13 – 15.

¹⁵ Tseliev O. V. Humanizm ta pryntsyipy verkhovenstva prava na prykladi prava na hromadsku nepokoru. Naukovyi visnyk KhNU. 2009. № 2. S. 5-8.

¹⁶ Pohrebniak S. P. Vtilennia pryntsyipy humanizmu v pravi. Visnyk Akademii pravovykh nauk Ukrainy. 2007. № 1. S. 33-42.

be taken into account when creating, implementing, applying and interpreting legal norms [¹⁷, p. 34-35].

Fundamentality and universality of the principle of humanism is due to the system of its imperatives and sub-imperatives, its structural components. When considering the formal and practical aspects of the implementation of the principle of humanism, we inevitably face the problem of its polystructurality, because the implementation of this principle affects the need to implement its components [¹⁸, p. 25].

One of the components, in our opinion, is the state of morality of society, the achievement of the highest development of society is directly related to the level of development of a member of such a society, citizen, official, etc. In a society with a high level of morality and ethics, it does not matter whether these rights are formalized or not, because the realization of human rights in such a society is natural [¹⁹, p. 35].

However, it should be noted that the category of humanism is not new. Even during the Soviet era, the socialist law existing at that time was considered the most humane law in the world, as socialism was seen as the most progressive world phenomenon. The humanism of Soviet law was seen by scholars primarily in the elimination of class and social antagonisms, as well as in the fundamental rights and freedoms of Soviet citizens formally proclaimed in all Soviet constitutions. [²⁰, c. 30].

At the same time, theoretical developments in the Soviet period were conducted mostly from a class standpoint and were extremely ideological. Legal scholars at the time emphasized that only socialist humanism was true and, moreover, unique. Thus, M. Kareva, in particular, wrote that the class essence of Soviet law also determines the real, that is, socialist humanism, real concern for man, unthinkable in bourgeois law, because true humanism and human exploitation are incompatible. [²¹, c. 12]. However, despite considerable ideological pressure, it was during the Soviet period that the basic provisions characterizing the content of the legal principle of humanism, which are of interest today, were formulated in the science of constitutional law.

It is necessary to distinguish between the implementation of the principle of humanism at the stage of lawmaking and at the stage of law enforcement: humanism, implemented in law, and humanism, used, for example, in the sentencing, are different phenomena. If humanism enshrined in legal norms is objective, then humanism, which is guided by law enforcement, is subjective and the use of this principle depends solely on the level of legal awareness, legal culture of the person applying the legal norm. [²², c. 34]. Thus,

¹⁷ Pohrebniak S. P. Vtillennia pryntsyphu humanizmu v pravi. Visnyk Akademii pravovykh nauk Ukrainy. 2007. № 1. S. 33-42.

¹⁸ Momot M. O. Dialektyka spravedlyvosti ta humanizmu v pravotvorchosti. Pravo i suspilstvo. 2010. № 3. S. 24-29.

¹⁹ Bysaha Yu.M., Kozodaiev S.P., Bielov D.M., Hromovchuk M.V. Zakhyst konstytutsiinykh prav i svobod liudyny u protsesi provedennia biomedychnykh doslidzhen. Uzhhorod, 2018. 172 s.

²⁰ Trukhanova, E. F. Zashchyta prav cheloveka pry provedenyy byomedysynskykh yssledovanyi :teoretycheskyi aspekt : dySSERTatsiya na soyskanye uchenoi stepeny kandydata yurydycheskykh nauk. Spetsyalnost 12.00.01 - teoriya y ystoriya prava y hosudarstva ; ystoriya uchenyi o prave y hosudarstve. M., 2010. 243 s.

²¹ Kareva M.P. Pravo y npravstvennost v sotsyalistycheskom obshchestve. M., 1951. 221 s.

²² Trukhanova, E. F. Zashchyta prav cheloveka pry provedenyy byomedysynskykh yssledovanyi :teoretycheskyi aspekt : dySSERTatsiya na soyskanye uchenoi stepeny kandydata yurydycheskykh nauk. Spetsyalnost 12.00.01 - teoriya y ystoriya prava y hosudarstva ; ystoriya uchenyi o prave y hosudarstve. M., 2010. 243 s.

humanism in law can be manifested through the generally accepted moral requirements, which, as A. Malko rightly points out in this regard, play a limiting role in relation to man and are aimed primarily at preserving, positively preserving the foundations in which the population is interested. [23, c. 55].

Conclusions. Humanism, in our opinion, as a legal category, is a worldview that considers man as a higher, self-sufficient and self-aware value. Humanism expresses the attitude to man in at least two ways: recognizes the social value of the human person her assessment. Thus, humanism is a certain moral requirement for human behavior, is a certain category of moral awareness of man of the highest social value in the state.

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ANALYSIS OF INCIDENCE AND MORTALITY FROM GASTRIC CANCER AMONG THE MALE AND FEMALE POPULATION IN CHERNIVTSI REGION AND UKRAINE FOR 2010-2019

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Abstract. The article presents a comparative analysis of morbidity and mortality from gastric cancer in Ukraine and Chernivtsi region over the past ten years, depending on age, sex and territorial affiliation. The issue of one- and five-year survival from gastric cancer depending on gender among the population of Chernivtsi region and Ukraine and the level of cancer care in it is covered.

Key words: incidence, mortality, gastric cancer, survival of patients.

Introduction. Ukraine is one of the countries with a high level of cancer and is among the top ten countries in the world in this regard. Moreover, according to scientists, by 2020 the number of people who get cancer for the first time in Ukraine will exceed 200 thousand people [1]. This emphasizes the importance of prevention of malignant neoplasms (MN). Important indicators of the effectiveness of this area of the health care system are the levels and trends of morbidity and mortality, including early detection and survival of cancer patients [2, 3, 4, 5]. Ukraine ranks 8-9 in the list of 49 countries with registered cancer (incidence of men - 39.5 per 100 thousand population, women - 22.4), annually the country registers 16-17 thousand new cases.

Gastric cancer (GC) occupies one of the leading positions in the structure of morbidity and mortality. It is one of the most common human tumors and ranks 2nd in the structure of cancer. In economically developed countries, the proportion of gastric cancer reaches 50% of all tumors of the gastrointestinal tract and 10-15% of the total number of tumors [6]. Every year, 750-850 thousand new cases of gastric cancer are registered in the world and more than 600 thousand people die from this disease, despite the stabilization of the incidence in some developed countries [7].

According to the Cancer Registry of Ukraine, in 2018, the GC ranks fourth in morbidity (6.9%) and second in mortality (9.5%) from malignant neoplasms in men, second only

to lung and prostate cancer. The incidence of GC in women is in seventh place (4.1% among all malignant tumors), and mortality is in third place (7.5% among all malignant tumors) after breast and colon cancer [1].

Morbidity and mortality can be considered as indicators of the level of socio-economic development of the state in general and the public health system in particular. After all, in the scientific literature it is proved that in the occurrence of pathology a significant role is played by general risk factors, such as: stress, poverty, unhealthy lifestyle, unsatisfactory social conditions, anthropogenic pollution, harmful working conditions, etc. [1, 5], so and special: smoking, alcohol and hot or too cold food and drink, chronic trauma, papillomavirus infection, and precancerous diseases [9-12]. Most of these factors are manageable and can be moderated through the organized efforts of society as a whole, i.e. they depend on the effectiveness of the public health system.

The purpose of the study: to study the ten-year trends in morbidity and mortality due to malignant neoplasms of the stomach in Ukraine and Chernivtsi region.

The main tasks and research methods. Analyzed the database of the National Cancer Registry of Ukraine for 2010-2019 [1] and information on "Notification of a patient with a first-time diagnosis of cancer or other malignant neoplasm" (form № 090 / r), data from the Statistics Committee of the Ministry of National Economy of Ukraine on the number and sex and age composition of the population of Chernivtsi region for 2010-2019 .

Used methods: epidemiological, medical and statistical.

Results and discussion. It is established that during the observation period the National Cancer Control Program was implemented in Ukraine [9], the order of the Ministry of Health of Ukraine dated 01.10.2013 № 845 "On the system of oncological care to the population of Ukraine" was adopted [10]. Perhaps that is why in the dynamics of the last decade (2010-2019) the primary incidence of gastric cancer showed a tendency to decrease (Fig. 1) as in Ukraine from 25.5 per 100 thousand population in 2010 to 19.5 similar cases in 2019, which is -23.5% in terms of visibility) and in Chernivtsi region (from 20.6 to 16.0 per 100 thousand population, respectively, i.e. 22.3%). In our opinion, another important reason for such positive dynamics could be: promotion of a healthy lifestyle, smoking cessation and alcohol at the state level (Ukraine's accession to the WHO Framework Convention on Tobacco Control and the implementation of a number of appropriate preventive measures at the state level [3]), modern possibilities of endoscopy and biopsy, which is performed among the population at risk to assess the course of various diseases and precancerous conditions, which significantly increases the likelihood of early gastric cancer and improves treatment outcomes.

No clear etiological factors for the occurrence of GC have been identified, although it is known that some conditions contribute to the development of gastric cancer. The role of nutrition is important: an unfavorable role is played by carbohydrate foods, lack of vitamins, especially vitamin A, ascorbic acid. Higher incidence of gastric cancer is observed in areas with excessive levels of nitrates in soil, water and food (Kyiv 23.6, Kharkiv 24.5, Khmelnytsky 25.0 and Chernihiv region 30.3 per 100 thousand population). Nitrates during interaction with amines in the stomach, especially with low acidity of gastric juice, form nitrosamines, the carcinogenic effect of which has been proven. Bacteria that promote the synthesis of nitrosamines die in the normal environment of the stomach. Foods high in benzopyrene (smoked, fried foods), which predominate in the diet of older men, also cause GC. Increased morbidity and mortality from GC among the male population of Ukraine can also be explained by the abuse of strong alcoholic beverages, smoking.

Among smokers, the risk of the disease is four times higher than among non-smokers. Consumption of salty foods increases the risk of disease several times, and consumption of milk (as well as fresh vegetables and fruits) reduces the risk of disease by 30%. The disease is facilitated by a lack of cobalt, magnesium in the soil and food, an excess of zinc and copper. Vitamin A, carotene, synthetic retinoid, ascorbic acid, which have antioxidant properties, prevent the formation of nitrosamines in the digestive tract.

The incidence of GC per 100 thousand population

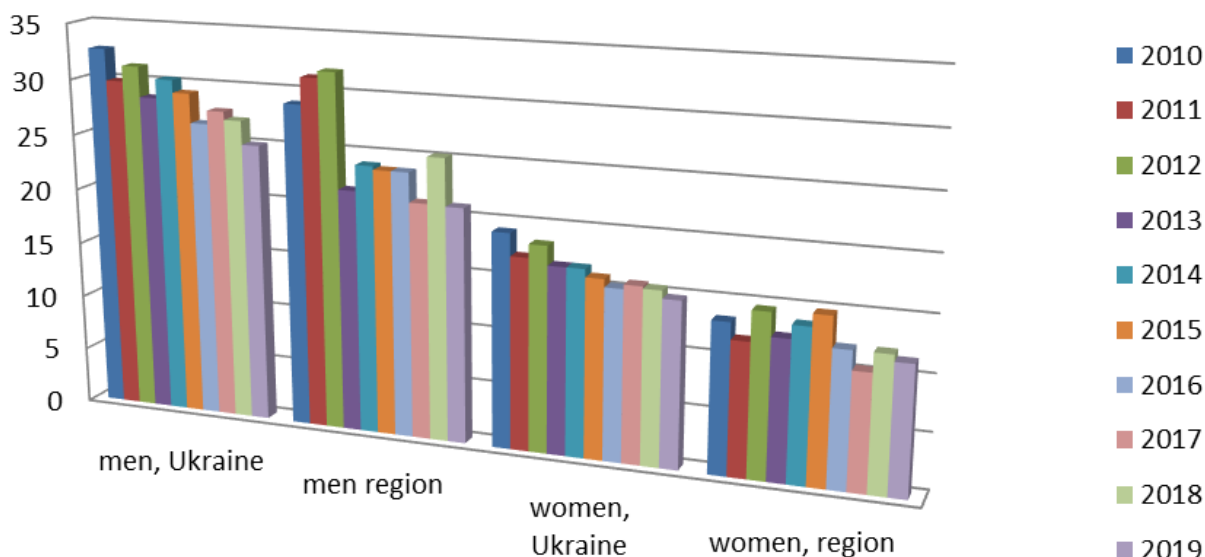


Fig. 1. Indicators of primary incidence of gastric cancer among men and women in Ukraine and Chernivtsi region for 2010-2019.

In Ukraine, the incidence of gastric cancer is currently 19.5 cases per 100 thousand population, men are more than 2 times higher than women (respectively 25.0 and 14.8 per 100 thousand population), and mortality is 15.3 per 100 thousand population (among the male population - 20.3, and female - 10.9 per 100 thousand population). Morbidity and mortality in Ukraine are quite high (the average world standard is 8.2, for men - 13.1, for women - 5.1 per 100 thousand population, respectively).

Similar to the incidence rates, gastric mortality rates in Chernivtsi region (Fig. 2) are also not significantly lower than similar rates for gastric cancer in Ukraine and showed approximately the same trends as in the primary incidence over the past ten years.

Thus, mortality from gastric cancer in Ukraine also decreased slightly (from 19.2 to 14.0 per 100 thousand population during 2010-2019, which is - 27% in terms of visibility), and in Chernivtsi region - fluctuated with varying intensity in the range of 18.3-13.2 cases per 100 thousand population, which is 27.9% showing a generally stable trend and equalization of indicators over the past five years to national values. The application of the standardization method did not change the ratio between the compared indicators of Ukraine and Chernivtsi region (5.1-5.2 per 100 thousand population).

Gastric cancer mortality per 100 thousand population

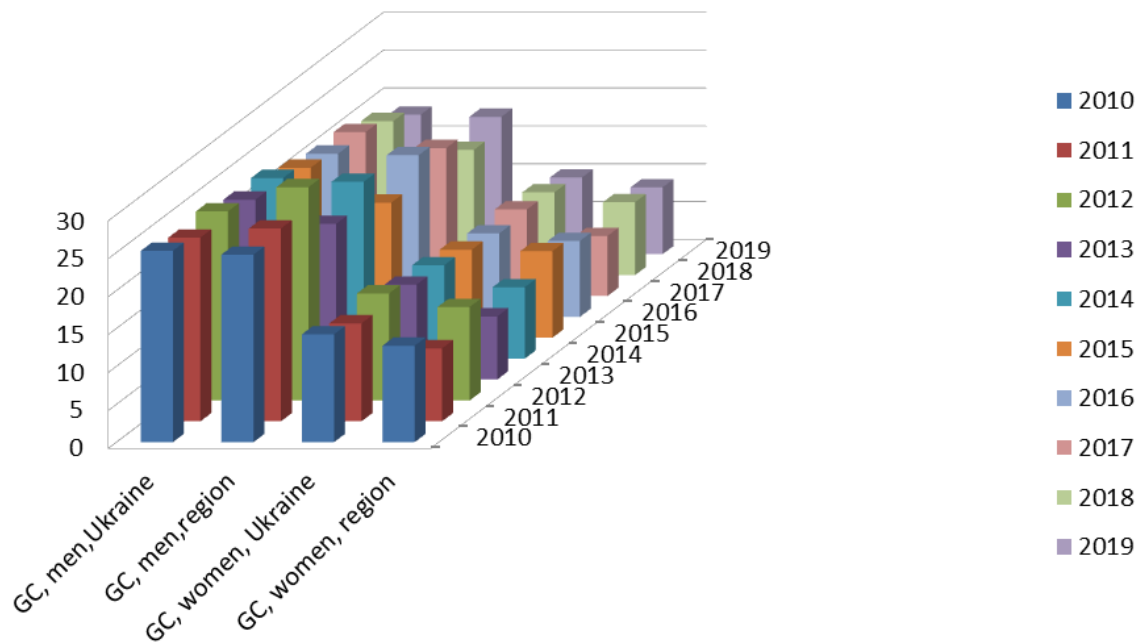


Fig. 2. Mortality rates from gastric cancer in Ukraine and Chernivtsi region for 2010-2019.

It should be noted that men suffer from gastric cancer several times more often than women (Table 1).

Table 1.

Indicators of morbidity, mortality and contingents of patients with gastric cancer among the male and female population of Ukraine and Chernivtsi region for 2010-2019 (per 100 thousand of the relevant population)

Years	Ukraine						Chernivtsi region					
	Incidence		Mortality		Contingents of patients		Incidence		Mortality		Contingents of patients	
	m	w	m	w	m	w	m	w	m	w	m	w
2010	32,7	19,2	25,2	14,1	90,0	61,5	28,9	13,4	24,7	12,7	103,1	74,4
2011	29,9	17,2	24,2	12,9	89,3	61,5	31,3	11,9	25,4	9,6	106,1	73,0
2012	31,3	18,4	24,9	14,1	89,8	62,3	31,9	14,6	28,1	12,3	105,0	71,1
2013	28,6	21,7	23,7	12,5	90,0	63,3	16,7	12,5	20,5	8,3	103,9	74,6
2014	30,3	16,7	23,8	12,3	91,9	64,3	24,0	13,7	23,3	9,4	101,3	76,4
2015	29,2	16,0	22,4	11,6	89,6	62,2	23,7	14,8	17,8	11,4	102,5	76,6
2016	26,6	15,3	21,5	11,0	87,0	60,8	23,7	12,1	21,3	10,0	97,6	72,2
2017	27,8	15,7	21,6	11,4	86,8	60,9	21,1	10,4	19,5	7,9	96,7	73,0
2018	27,1	15,5	20,3	10,9	87,8	62,0	25,2	12,1	16,5	9,6	99,9	72,2
2019	25,0	14,8	18,4	10,1	91,3	64,2	21,0	11,5	18,1	8,8	102,7	73,8

Also, one of the most adequate criteria for assessing the effectiveness of cancer care is survival. It should be noted that the study of this indicator at the population level in different countries is quite rare. The first international cancer survival studies were conducted in 1964 by the US National Cancer Institute and included patients from Denmark, England, Finland, France, Norway and the United States with the most common nosological forms of cancer. Subsequently, such studies were conducted by the International Agency for Research on Cancer, using data from population cancer registries in some countries, provided that they meet quality standards and the level of traceability of patients, which should be 95% for statistical reliability. In Ukraine, population survival has not been studied in cancer epidemiological research; as a rule, the survival rate is used only for comparative evaluation of the effectiveness of different treatments in clinical trials.

Survival analysis was performed for patients with gastric cancer (C16) diagnosed in 2014–2019, except for patients with multiple tumors; the studied cohort included 23,991 men and 15,589 women (Table 1). The values of relative survival by cumulative method for male and female population of both Ukraine in general and in Chernivtsi region in particular were calculated. The study uses personalized data from the National Cancer Registry of Ukraine and modern methods of statistical analysis adopted in oncology and descriptive epidemiology. Based on the principles and methods of medical informatics, quality control of primary information in the database was carried out.

The survival rate of patients with GC was studied in a cohort of 30,103 men and 19,768 women (Table 1) and compared with a similar incidence of cancer in the Chernivtsi region. It was found that the 1-year survival rate in Chernivtsi region among men and women of this cohort is significantly higher than the average Ukrainian (39,2 i 35,8% respectively). The difference in the 5-year survival of patients with malignant neoplasms of the stomach in men and women in Chernivtsi region in comparison with the average in Ukraine (16,1 i 15,9%) was not so significant (Fig. 3).

Survival of patients with gastric cancer

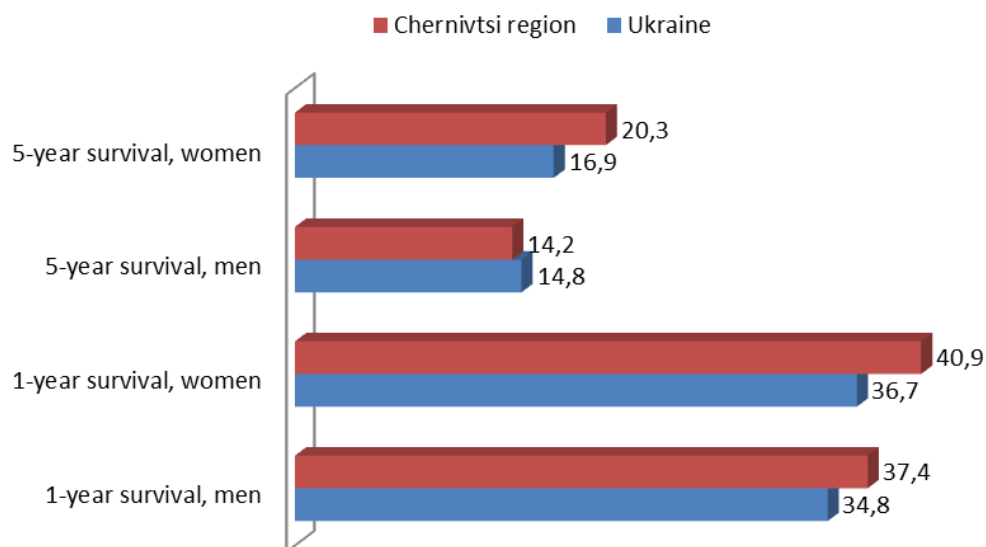


Fig. 3. *Survival of patients with gastric cancer*

The 5-year survival rate of patients with gastric cancer in the regions we studied is 2–2.5 times lower than the 1-year level. To find out the possible reasons for the low survival rate of patients with gastric cancer, the main indicators of the organization of cancer care for patients in this category were studied (Table 2). It was found that in the Chernivtsi region the level of detection of gastric cancer in the abandoned stage is 1.2 times higher than in the all-Ukrainian.

Table 2.

The main indicators of the organization of oncological care for patients with gastric cancer

Administrative region	I – II stage,%	IV stage,%	Did not live 1 year,%	Covered by special treatment,%	Morphological verification of the diagnosis,%
Ukraine	34,6	35,7	59,38	45,1	82,3
Chernivtsi region	23,7	43,2	62	52,9	83,6

The 1-year survival of this category of patients is almost 1.6 times less than the rate of detection of the disease in the I-II stage in Chernivtsi region and almost coincides with the corresponding indicators in Ukraine. In Chernivtsi region, 14.3% fewer patients survive within 1 year than were detected in stages I – II, which indicates a possible inadequacy of establishing the stage of the disease. It was also revealed that in Chernivtsi region half of patients with gastric cancer were covered by special treatment, and in Ukraine - 45.1%.

It is also important to analyze indicators of the quality of preventive work of medical institutions, which include indicators of neglect (detection of MN at stage III-IV and mortality up to a year from diagnosis), as well as the proportion of primary cases detected during preventive examinations. Correlation-regression analysis proved that there is a strong feedback between the last indicator and the indicators of neglect: the higher the coverage of preventive examinations, the lower the frequency of late stages of cancer ($r_{xy} = -0.97$, $p < 0.05$) and mortality up to one year (-0.99). However, there is a strong direct relationship between the two indicators of neglect (0.98).

As can be seen in Fig. 4, in this regard, the best situation and dynamics are characteristic of indicators of early diagnosis of gastric cancer.

During the study period, only a small proportion of primary cases in Ukraine were detected during preventive examinations (9.3% and 6.6% in 2010 and 2019, respectively), which indicates an insufficient level of preventive work with the population. As the rates of neglect are quite high and do not show a positive trend in both late detection (30.8% and 36.5%) and mortality up to one year (62.2% and 59.7%), there is a need for in-depth study of medical -organizational causes of late detection of gastric cancer as a scientific basis for the development of effective prevention measures.

In Chernivtsi region (Fig. 4) the increase in the proportion of cases of gastric cancer detected during preventive examinations (from 6.6% to 6.9%) was accompanied by an

increase in the proportion of stages III-IV (from 38.2% to 50, 0%) and a slight increase in mortality up to one year (from 55.5% to 59.9%).

Frequency of Gastric Cancer

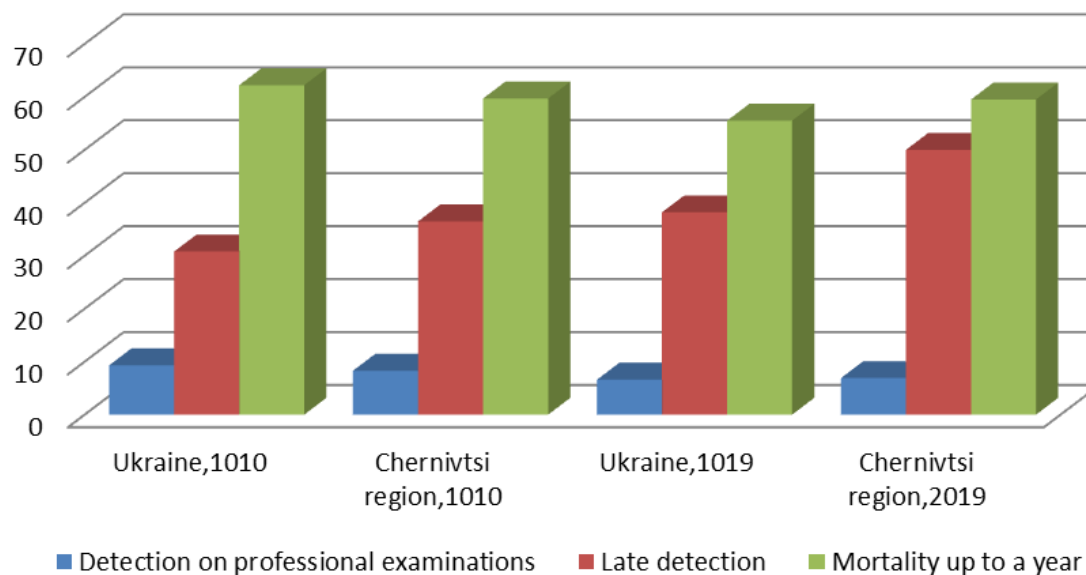


Fig. 4. Indicators of the frequency of detection of gastric cancer during preventive examinations, the proportion of detected cases in stages III-IV and mortality up to one year from the date of diagnosis in Ukraine and Chernivtsi region in 2010 and 2019.

Conclusions.

1. Trends in the ten-year dynamics and levels of gastric cancer morbidity and mortality in Ukraine (reduction of primary morbidity and mortality, increase in pathological morbidity, reduction of the share of late diagnosis and mortality up to one year) prove the effectiveness and expediency of preventive measures at the state level. WHO Convention on Tobacco Control, the National Cancer Program (and the Cancer Program) and in health care facilities (through the coverage of the population with preventive examinations).

2. A threatening epidemiological situation with gastric cancer, characterized by an increase in the primary incidence of the population of Ukraine, in half of the cases due to neglected stages. This leads to low survival (over 40% die within a year) and increased mortality, mainly male.

3. It is established that in Chernivtsi region the trends and levels of the absolute majority of the considered indicators are worse than in Ukraine as a whole.

4. It is proved that there is a strong reliable feedback between the indicator of the frequency of detection of malignant neoplasms during preventive examinations and the indicators of neglect ($r_{xy} = -0.97-0.99$), which confirms the importance of the impact of preventive medical and organizational technologies on early detection cancer.

5. The results indicate the urgent need to develop and implement a program for the prevention of gastric cancer at the state and regional levels.

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PRINCIPLE OF HUMANISM IN MEDICINE: CERTAIN ASPECTS

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Annotation. Based on the above, the following cases of application of the principle of humanism should be distinguished: 1) the direct connection between science and humanistic values; 2) the predominance of humanistic goals over research; 3) the need to regulate research from the standpoint of humanistic values, including and the existence of a ban on certain experimental actions involving humans that may be life-threatening); 4) the need to develop rules for biomedical research taking into account human rights, including regulations.

Key words: principle of humanism, constitutional principle, medicine, principle of law.

The reform of the constitutional order taking place in our state presupposes a new meaning of the principle of humanism as a fundamental principle of law, which allows to concretize and redefine its content. These circumstances are confirmed by the fact that many modern leading jurists, standing in different positions, at the same time, distinguish the principle of humanism as an integral principle of law and legislation. At the same time, today there is no clear legally enshrined term “humanism”, almost no new concepts are being developed about the content of this principle in legal science. At the same time, according to E. Trukhanov, the issue of humanism in the context of modernity was and remains key in the science of constitutional law, theory of state and law, philosophy of law, understanding the essence of rights and freedoms in various spheres of human life²⁴.

However, it should be noted that the category of humanism is not new. Even during the Soviet era, the socialist law existing at that time was considered the most humane law in the world, as socialism was seen as the most progressive world phenomenon. The humanism of Soviet law was seen by scholars primarily in the elimination of class and social antagonisms, as well as in the fundamental rights and freedoms of Soviet citizens formally proclaimed in all Soviet constitutions²⁵.

²⁴ Trukhanova, E. F. Zashchyta prav cheloveka pry provedenyy byomedytynskykh yssledovanyi :teoretycheskyi aspekt : dySSERTatsyia na soyskanye uchenoi stepeny kandydata yurydycheskykh nauk. Spetsyálnost 12.00.01 - teoryia y ystoriia prava y hosudarstva ; ystoriia uchenyi o prave y hosudarstve. - M., 2010. - 243 s.

²⁵ Trukhanova, E. F. Zashchyta prav cheloveka pry provedenyy byomedytynskykh yssledovanyi :teoretycheskyi aspekt : dySSERTatsyia na soyskanye uchenoi stepeny kandydata yurydycheskykh nauk. Spetsyálnost 12.00.01 - teoryia y ystoriia prava y hosudarstva ; ystoriia uchenyi o prave y hosudarstve. - M., 2010. - 243 s.

At the same time, theoretical developments in the Soviet period were conducted mostly from a class standpoint and were extremely ideological. Legal scholars at the time emphasized that only socialist humanism was true and, moreover, unique. Thus, M. Kareva, in particular, wrote that the class essence of Soviet law also determines the real, that is, socialist humanism, real concern for man, unthinkable in bourgeois law, because true humanism and human exploitation are incompatible²⁶. However, despite considerable ideological pressure, it was during the Soviet period that the basic provisions characterizing the content of the legal principle of humanism, which are of interest today, were formulated in the science of constitutional law.

It is necessary to distinguish between the implementation of the principle of humanism at the stage of lawmaking and at the stage of law enforcement: humanism, implemented in law, and humanism, used, for example, in the sentencing, are different phenomena. If the humanism enshrined in legal norms is objective in nature, then humanism, which is guided by law enforcement, is subjective and the use of this principle depends solely on the level of legal awareness, legal culture of the person applying the legal norm²⁷. Thus, humanism in law can be manifested through generally accepted moral requirements, which, as A. Malko rightly points out in this regard, play a limiting role in relation to man and are aimed primarily at preserving, positively preserving the foundations in which the population is interested²⁸.

Humanism in medicine carries two very large concepts, behind which are realities of special significance and special dimension. Speaking of humanism, we must first ask the question: what is man? The answer to this question must be such as to reflect the holistic nature of man. Similarly, when talking about medicine, it is necessary to ask yourself about its meaning and purpose. The etymology of the Latin word, from which the word "medicine" comes in its current meaning, indicates that the word originally meant "mixing herbs for healing, prescribing remedies" and "healing and healing"²⁹. And here we have to ask the question: who or what is the object of healing in medicine? Obviously, this is a person whose whole nature needs to be clarified. But this answer, in turn, puts us in a rather awkward position. Is there anything inhuman in medicine that aims to heal a person? Can human healing itself be inhuman?³⁰

Apparently, no one can question the humanism of the medical profession, when barely alive people are put on their feet, chained to the bed, they return the joy of active life, help the mother in childbirth, and the child - to look at the world for the first time. The medical profession is very often an art in the strictest sense of the word, very often it is heroism. All this is for the sake of man, for the sake of his health, for the sake of his life³¹.

²⁶ Kareva M.P. Pravo y нравstvennost v sotsyalysticheskom obshchestve. M., 1951. 221 s.

²⁷ Trukhanova, E. F. Zashchyta prav cheloveka pry provedenyy byomedytsynskyyh yssledovanyi :teoretycheskyi aspekt : dySSERTatsiya na soyskanye uchenoi stepeny kandydata yurydycheskyyh nauk. Spetsyalnost 12.00.01 - teoriya y ystoriya prava y hosudarstva ; ystoriya uchenyi o prave y hosudarstve. - M., 2010. - 243 s.

²⁸ Malko A.V. Новые yavleniya v polytyko-pravovoi zhyzny Rossyy: voprosy teoryy y praktyky. Toliatty.1999. 188 s.

²⁹ Herper's Latin Dictionary, A New Latin Dictionary ed. by Andrews LL.D. New York, Cincinnati, Chicago: American Book Company, 1907.

³⁰ Bysaha Yu.M., Kozodaiev S.P., Bielov D.M., Hromovchuk M.V. Zakhyst konstytutsiinykh prav i svobod liudyny u protsesi provedennia biomedychnykh doslidzhen. Uzhhorod, 2018. 172 s.

³¹ Pidlisnyi Yu. Hidnist liudskoi osoby ta deiaki mezhovi medychni praktyky / Yurii Pidlisnyi [Elektronnyi resurs] - Rezhym dostupu : <http://www.family-institute.org.ua/>

Medical research in all possible areas is designed to improve tools, skills, medicines and tools, enrich knowledge in order to most effectively help people, promote their health and life. In the context of the above, we must not forget about the category of "bioethics", which emerged in the 60's of XX century. in the United States as a form of moralization of science in general, but especially biomedicine, in the 80's of XX century. gained recognition in Europe, and in the 90's began to spread widely in Ukraine. The subject of bioethics as an integrative interdisciplinary field of knowledge were the problems of comprehensive biomedical research of the role and importance of natural earthly life in the destiny of all mankind and philosophical understanding of human creativity. Interest in the problem of life manifests itself in various forms and characterizes the radical changes that occur in the natural and social development of the world and especially. Therefore, a special area in the scientific study of life was the philosophical awareness of the limits of ethical and legal components of human scientific activity in its various manifestations³².

"Of course, professionalism is valued today. But does society need doctors and lawyers who have an idea of the basic norms of morality? - V. Popov correctly asks. - Do we need biologists who don't care who to experiment with - a rat or a human? Do we need scientists and engineers who are equally willing to build a nuclear power plant, an atomic bomb or a portable explosive device? Will "professionals" be worthy and responsible citizens of their country? Is the bias towards naked "professionalism" threatened by the fact that if we go this way, very soon our society will become a mechanical set of selfish professionals who are ready for anything for their own benefit. After all, a killer is also a "professional"!³³.

Today, many traditional problems of ethics, especially in science and medicine, are extremely relevant. They are associated with hopes for new prospects for the humanization of human life, the fight against disease, finding effective ways to preserve human health and strengthen his spiritual strength, overcoming the negative consequences of active creative activity of scientists and physicians. In modern life there are tools that, by increasing the intellectual coefficient of people, do not destroy moral consciousness. One of the main problems: we must learn to behave in accordance with the new ethics of life, called bioethics, and find happiness in life. Today there is no clear enough understanding of the relationship between the two basic principles in the life of science and medicine - morality and scientific creativity. And such a relationship is necessary. Thus, it is on this basis, without the use of the legal principle of humanism, that the development of a further modern concept of human and civil rights and freedoms is simply not possible.

Thus, it becomes obvious that humanism is a complex concept that permeates all spheres of human existence and is realized both objectively - by enshrining it in the rules of law and the existence of a certain type of legal understanding, and subjectively - by using this principle in the process law enforcement and law enforcement.

Taking into account the comprehensive analysis of the principle of humanism in the process of complication and development of social relations, it is possible to formulate a new definition that corresponds to modern realities. Thus, it seems to us that the application of the principle of humanism in the realization of somatic human rights in

³² Pavlova T.N. Byoetyka v vimshei shkole. K.: Kyevskiy ykoloho-kulturn tsentr, 1998. 128 s.

³³ Popov M.V. Akxyolohiia i medytsyna (Problema tsinnostei i medytsyna). K.: PARAPAN, 2003. 284 s.

biomedical research is the attitude to human life and health as the highest social value in biomedical research.

Based on the above, the following cases of application of the principle of humanism should be distinguished: 1) the direct connection between science and humanistic values; 2) the predominance of humanistic goals over research; 3) the need to regulate research from the standpoint of humanistic values, including and the existence of a ban on certain experimental actions involving humans that may be life-threatening); 4) the need to develop rules for biomedical research taking into account human rights, including regulations³⁴.

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ЗАЛЕЖНІСТЬ ЗНАЧЕНЬ ВОДНЕВОГО ПОКАЗНИКА ТА МІНЕРАЛІЗУЮЧОГО ПОТЕНЦІАЛУ РОТОВОЇ РІДИНИ ВІД СТУПЕНЯ АКТИВНОСТІ КАРІЄСУ, ВІКУ У ПІДЛІТКІВ, ЯКІ НАВЧАЮТЬСЯ В РІЗНИХ ЗАКЛАДАХ ОСВІТИ

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Карієс, що виникає в дитячому та підлітковому віці, призводить до втрати зубів в подальшому, що зумовлює порушення жувальної функції, естетики. Активність каріозного процесу у кожного окремого індивідууму обумовлена загальним станом його здоров'я та гомеостазу порожнини рота (1,6,8), геохімічними умовами проживання (2,3,4,9), соціальними факторами (5,7), які слід враховувати для розробки профілактичних заходів, направлених на підвищення резистентності твердих тканин зубів. Вплив окремих показників ротової рідини на виникнення карієсу у дітей і підлітків вивчений достатньо широко (10,11,12,13). Фізіологічні норми водневого показника і мінералізуючої здатності ротової рідини обумовлюють стабільність і карієсрезистентність емалі. Зниження їх призводить до демінералізації емалі та порушення цілісності твердих тканин зубів. Важливим є вивчення цих показників при різних ступенях активності карієсу у підлітків, які навчаються в різних закладах освіти та мають різні соціально-гігієнічні умови проживання.

Мета дослідження: вивчити рН і мінералізуючий потенціал ротової рідини підлітків 15-18 років, які навчаються в різних закладах освіти з урахуванням віку та ступеню активності карієсу.

Об'єкти і методи дослідження

Під нашим спостереженням знаходилися 540 підлітків, які навчалися в школі (107 осіб), коледжі (317 осіб), університеті (116 осіб) в місті Чернівці. Вік обстежених – від 15 до 18 років. Вивчення досліджуваних показників відбувалося з урахуванням ступеня активності карієсу у кожному віковому періоді (Виноградова Т.Ф.: компенсований (I), субкомпенсований (II), декомпенсований (III) (14).

Водневий показник (рН) досліджували з використанням смужки індикаторного паперу (рН 0-12, виробництво «Lachema», Чехія). Індикаторну стрічку занурювали та спостерігали за зміною кольору паперу.

Мінералізуючий потенціал ротової рідини оцінювали за її мікро кристалізацією (П.А. Леус, 1977) (15). Забір ротової рідини проводили стерильною піпеткою з дна ротової порожнини, мінімум через 2 години після прийому їжі та її полоскання дистильованою водою. На оброблене етиловим спиртом та висушене при кімнатній температурі предметне скло наносили три краплі ротової рідини. Краплі, після їх висихання вивчали з використанням мікроскопу. Мінералізуючий потенціал ротової рідини визначали середнім балом, у залежності від виявлених типів МКС. Оцінку мікрокристалізації проводили за Х.М. Сайфуліною, О.Р. Поздєєвим

в середніх балах залежно від типів кристалоутворення: 0,1- 1,0 - дуже низький рівень; 1,1- 2,0 - низький; 2,1- 3,0 - задовільний; 3,1-4,0 - високий; 4,1-5,0 - дуже високий.

Отримані результати опрацьовані методом варіаційної статистики. Вірогідними вважались показники при $p \leq 0,05$ (16).

Результати дослідження та їх обговорення

Вивчення рН з урахуванням ступеня активності карієсу та закладу, в якому навчаються підлітки виявило, що при I ступені активності карієсу найвищий показник мають підлітки, які навчаються в університеті, а найнижчий – у відвідувачів коледжу (табл.1). При II ступеню активності карієсу, який спостерігаємо у учнів коледжу та студентів університету, вірогідної різниці показника рН нами не виявлено. III ступінь активності карієсу був лише у відвідувачів коледжу. Водневий показник у них найнижчий від усіх груп спостереження ($p < 0,05$). Тобто у підлітків концентрація іонів водню залежить від ступеня тяжкості перебігу карієсу та місця навчання.

Таблиця 1.

Водневий показник ротової рідини у підлітків 15-18 років із різним ступенем активності карієсу та різних форм навчання (M±m)

Ступінь активності карієсу	Форми навчання (заклад освіти)				рк-ш	рк-у	рш-у
	разом n=540	коледж n=317	школа n=107	універ n=116			
I	n=335 6,84±0,01	n=115 6,68±0,02	n=107 6,89±0,01	n=113 6,94±0,01	≤0,001	≤0,001	≤0,01
II	n=105 6,74±0,01	n=102 6,73±0,01	- n=0	n=3 6,9±0,1	-	≥0,05	-
III	n=100 6,61±0,02	n=100 6,62±0,02	n=0	n=0	-	-	-
pI-II	≤0,001	≤0,05	-	≥0,05	-	-	-
pI-III	≤0,001	≤0,05	-	-	-	-	-
pII-III	≤0,001	≤0,001	-	-	-	-	-

Виникає необхідність вивчення показника рН з урахуванням віку пацієнтів, місця навчання та ступеня активності карієсу. В підлітків 15 років нами не зареєстровано III ступеню активності карієсу та II ступінь активності карієсу не зареєстровано у школярів. Порівняння водневого показника при I ступені активності карієсу школярів і відвідувачів коледжу виявило вірогідну різницю, показник був гірший у студентів коледжу (табл.2). Також спостерігаємо у них погіршення показника при наявності II ступеня активності карієсу в порівнянні з I ($p < 0,05$).

Ідентичну картину спостерігаємо, досліджуючи 16-річних пацієнтів. У відвідувачів коледжу в залежності від ступеня активності карієсу (від I до III) погіршується і значення показника рН. Також спостерігаємо вірогідну різницю показника підлітків коледжу та школи з I ступенем активності карієсу.

Підлітки 17-18 років мали всі ступені активності карієсу і рН змінювалося в залежності від них та з урахуванням місця навчання досліджуваних. Найнижчий показник спостерігали у студентів коледжу з III ступенем активності карієсу.

Таблиця 2.

Водневий показник ротової рідини у підлітків із різним ступенем активності карієсу та різних форм навчання у кожному віковому періоді (M±m)

Вік	Ступінь активності карієсу	Значення водневого показника (од.), назва закладу освіти, кількість				рк-ш	рк-у
		разом	коледж	школа	університет		
15 років n=127	I	n=101 6,78±0,02	n=48 6,69±0,01	n=53 6,86±0,02	-	≤0,001	-
	II	n=26 6,42±0,03	n=26 6,42±0,03	- n=0	-	-	-
	III	n=0	n=0	n=0	-	-	-
pI-II		≤0,001	≤0,001	-	-	-	-
16 років n=110	I	n=71 6,89±0,02	n=17 6,82±0,03	n=54 6,92±0,02	-	≤0,05	-
	II	n=27 6,71±0,02	n=27 6,71±0,02	n=0	-	-	-
	III	n=12 6,42±0,07	n=12 6,42±0,07	n=0	-	-	-
pI-II		≤0,001	≤0,01	-	-	-	-
pI-III		≤0,001	≤0,001	-	-	-	-
pII-III		≤0,01	≤0,01	-	-	-	-
17 років n=174	I	n=82 6,91±0,01	n=24 6,83±0,02	-	n=58 6,93±0,02	-	≤0,01
	II	n=64 6,69±0,01	n=64 6,69±0,01	-	n=0	-	-
	III	n=28 6,59±0,03	n=28 6,59±0,03	-	n=0	-	-
pI-II		≤0,001	≤0,001	-	-	-	-
pI-III		≤0,001	≤0,001	-	-	-	-
pII-III		≤0,01	≤0,01	-	-	-	-
18 років n=129	I	n=76 6,92±0,01	n=18 6,85±0,02	-	n=58 6,95±0,02	-	≤0,01
	II	n=27 6,77±0,02	n=27 6,77±0,02	-	n=0	-	-
	III	n=26 6,63±0,03	n=26 6,63±0,03	-	n=0	-	-
pI-II		≤0,001	≤0,05	-	-	-	-
pI-III		≤0,001	≤0,001	-	-	-	-
pII-III		≤0,01	≤0,01	-	-	-	-

Показник мікрокристалізації ротової рідини у обстежуваного контингенту різнився в залежності від ступеня активності карієсу та місця навчання (табл.3). Він завжди був нижчий у студентів коледжу в порівнянні з відвідувачами інших закладів освіти ($p \leq 0,01$), що призводить до підвищення інтенсивності карієсу у них при порівнянні з іншими підлітками навіть при однаковому ступеню активності каріозного процесу.

Таблиця 3.

Показники мікрокристалізації ротової рідини у підлітків 15-18 років із різним ступенем активності карієсу та різних форм навчання ($M \pm t$)

Ступінь активності карієсу	Усі n=540	коледж n=317	школа n=107	університет n=116	рк-ш	рк-у	рш-у
I	n=335 2,07±0,01	n=115 1,95±0,03	n=107 2,11±0,02	n=113 2,14±0,01	≤0,01	≤0,001	≥0,05
II	n=105 1,88±0,01	n=102 1,87±0,02	- n=0	n=3 2,23±0,03	-	≤0,001	-
III	n=100 1,75±0,02	n=100 1,75±0,02	- n=0	- n=0	-	-	-
pI-II	≤0,001	≤0,05	-	≤0,05	-	-	-
pI-III	≤0,001	≤0,001	-	-	-	-	-
pII-III	≤0,001	≤0,001	-	-	-	-	-

Вивчення досліджуваного показника при різних ступенях активності карієсу у віковій групі 15-річних засвідчувало те, що при I ступені активності карієсу він був гірший у підлітків. Які відвідують коледж в порівнянні зі школярами (табл.4). При II ступені активності карієсу мінералізуючий потенціал у студентів коледжу знижується в порівнянні з I ступенем активності каріозного процесу.

В 16 років спостерігаємо картину, що відповідає 15-річним, але цифрові показники вірогідно вищі, ніж в попередній віковий період.

17-18 років – це підлітки коледжу і університету. При наявності у них I ступеня активності карієсу мінералізуючий потенціал вірогідно відрізнявся та мав вищі показники у підлітків закладу вищої освіти.

Таблиця 4.

Показники мікрокристалізації ротової рідини у підлітків із різним ступенем активності карієсу та різних форм навчання у кожному віковому періоді ($M \pm t$)

Вік, n	Активність карієсу	Усі	коледж	школа	університет	рк-ш	рк-у
15 років n=127	I	n=101 2,00±0,03	n=48 1,91±0,04	n=53 2,07±0,03	-	≤0,01	-
	II	n=26 1,77±0,04	n=26 1,77±0,04	- n=0	-	-	-
	III	n=0	n=0	n=0	-	-	-

Вік, n	Активність карієсу	Усі	коледж	школа	універ- ситет	рк-ш	рк-у
	pI-II	≤0,001	≤0,05	-	-	-	-
16 років n=110	I	n=71 2,10±0,02	n=17 1,99±0,04	n=54 2,14±0,02	-	≤0,01	-
	II	n=27 1,86±0,04	n=27 1,86±0,04	- n=0	-	-	-
	III	n=12 1,7±0,06	n=12 1,7±0,06	- n=0	-	-	-
	pI-II	≤0,001	≤0,05	-	-	-	-
	pI-III	≤0,001	≤0,001	-	-	-	-
	pII-III	≤0,05	≤0,05	-	-	-	-
17 років n=174	I	n=82 2,08±0,02	n=24 2,0±0,04	-	n=58 2,11±0,02	-	≤0,05
	II	n=64 1,87±0,03	n=64 1,87±0,03	-	- n=0	-	-
	III	n=28 1,82±0,06	n=28 1,82±0,06	-	- n=0	-	-
	pI-II	≤0,001	≤0,05	-	-	-	-
	pI-III	≤0,001	≤0,05	-	-	-	-
	pII-III	≥0,05	≥0,05	-	-	-	-
18 років n=129	I	n=76 2,13±0,02	n=18 1,95±0,06	-	n=58 2,18±0,02	-	≤0,01
	II	n=27 1,8±0,03	n=27 1,8±0,03	-	- n=0	-	-
	III	n=26 1,78±0,04	n=26 1,78±0,04	-	- n=0	-	-
	pI-II	≤0,001	≤0,05	-	-	-	-
	pI-III	≤0,001	≤0,05	-	-	-	-
	pII-III	≥0,05	≥0,05	-	-	-	-

Отримані нами результати свідчать про те, що підлітки, які навчаються в коледжі, мають яскраво виражену карієсогенну ситуацію в порожнині рота, що обумовлена, на нашу думку тим, що вони, в більшій мірі, проживають окремо від батьків, самостійно та не мають відповідного контролю з їх сторони. Це вказує на необхідність проведення профілактичної роботи з цим контингентом з метою виявлення факторів ризику, які зумовлюють таку ситуацію та можливостями впливу на них.

Проведені нами дослідження виявили, що водневий показник у підлітків 15-18 років залежить від ступеня активності карієсу та від того, за якою програмою навчаються підлітки. Значення рН знижуються від I до III ступеня активності карієсу не залежно від віку та місця навчання обстежуваних, але завжди найгірші у студентів коледжу та виходять за рамки фізіологічної норми, що впливає на мінералізуючу здатність ротової рідини та призводить до її зниження, результатом чого є виникнення каріозного процесу у них.

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ANALYSIS OF THE ASSORTMENT OF NASAL PREPARATIONS FOR TOPICAL USE IN THE STATE REGISTER OF MEDICINES OF UKRAINE

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Summary. Nasal preparations for topical use (NPTU) are very often used at the minor signs of acute inflammatory diseases of the upper respiratory tract.

Purpose. The purpose of our study was to analyse the assortment of NPTU used for treatment of the diseases of the nasal cavity at the pharmaceutical market of Ukraine in 2020.

Methods. The State Register of the Medicinal Products (SRMP) of Ukraine and ATC/DDD Index were the objects of the research in January 2020. Methods of data retrieval, frequency, comparative and marketing analysis were used.

Results. The special characteristics of the Ukrainian market based on the analysis of the SRMP of Ukraine and ATC/DDD Index were under the research in January 2020. The assortment of the NPTU, its dependence on imports and type of medical forms, the structure of their manufacturers and market entry were analysed.

Conclusions. At the beginning of 2020, only one third of the subgroups of the fourth level of NPTU in comparison to the list of such subgroups presented in the ATC/DDD Index was registered in the Ukrainian market. More than half of them contained only two active pharmaceutical ingredients (xylometazoline or oxymetazoline). The majority of NPTU were presented in the form of sprays and drops. More than one third of NPTU were locally produced. Almost two-thirds of producers, most of them foreign, used the contract method of entering the market.

Keywords: nasal preparations for topical use, assortment, The State Register of the Medicinal Products of Ukraine.

Introduction. Acute inflammatory diseases of the upper respiratory tract are widespread, and the problems of their treatment are very important in modern clinical medicine. In recent years, there has been an increase in the incidence of diseases of nose and paranasal sinuses in Ukraine. The prevalence of acute rhinitis, rhinosinusitis and rhinopharyngitis reached 489.9 cases per 10 thousand population, and the sickness rate was 5-15 cases per 1 thousand people depending on the season. Such patients made up 60-65% of otorhinolaryngology outpatients [5].

For the treatment of acute inflammatory diseases of the upper respiratory tract, the pharmaceutical market offered a large number of nasal preparations for topical use (NPTU). Research of these drugs was conducted in 2016 [1, 2]. However, their results were retrospective, as the market of drugs is a dynamic system.

Presentation of the main material of the article

The purpose of our study was to analyse the assortment of NPTU used for treatment of the diseases of the nasal cavity at the pharmaceutical market of Ukraine in 2020.

Materials and Methods. The State Register of the Medicinal Products (SRMP) of Ukraine [6] and ATC/DDD Index 2020 [4] were the objects of the research in January 2020. Methods of data retrieval, frequency, comparative and marketing analysis were used.

According to the Anatomical Therapeutic Chemical (ATC) classification system NPTU at the third level belonged to the therapeutic subgroup R01A "Decongestants and other nasal preparations for topical use" [4]. This subgroup included five subgroups at the 4th level such as "Sympathomimetics, plain" (R01AA), "Sympathomimetics, comb., excl. corticosteroids" (R01AB), "Antiallergic agents, excl. corticosteroids" (R01AC), "Corticosteroids" (R01AD), and "Other nasal preparations" (R01AX).

As can be seen from the table. 1, there were 57 subgroups of the fifth level (chemical substances) according to the ATC classification of the WHO at the time of the study. The subgroups of "Corticosteroids" (17 INN) and "Sympathomimetics, plain" (14 INN) were the biggest one. 36.8% of the 5th level subgroups of all existing NPTU were included in the SRMP of Ukraine [6]. The subgroup of "Sympathomimetics, comb., excl. corticosteroids" (71.4%) was the most fully represented.

Table 1.*Comparative analysis of NPTU in SRMP of Ukraine according to ATC classification system*

No	ATC codes and the names of 4th level subgroups	Quantity of						
		5th level subgroups			Trade names		Medical forms	
		according to ATC system	in SRMP of Ukraine					
		units	units	%	units	%	units	%
1.	R01AA "Sympathomimetics, plain"	14	5	35.7	93	60.8	114	57.3
2.	R01AB "Sympathomimetics, comb., excl. corticosteroids"	7	5	71.4	23	15.0	27	13.6
3.	R01AC "Antiallergic agents, excl. corticosteroids"	9	2	22.2	3	2.0	3	1.5
4.	R01AD "Corticosteroids"	17	6	35.3	20	13.1	33	16.6
5.	R01AX "Other nasal preparations"	10	3	30.0	14	9.2	22	11.1
Total		57	21	36.8	153	100	199	100

According to the SRMP of Ukraine, NPTU were registered / re-registered from five subgroups of the 4th level of the ATC classification system in January 2020. There were 16 INN in the form of 153 trade names and 199 different dosage forms and packages (Table 1). 60.8% of the analysed drugs belonged to a subgroup of "Sympathomimetics, plain". Almost equal shares were occupied by "Sympathomimetics, comb., excl. corticosteroids" (15.0%) and "Corticosteroids" (13.1%). One tenth of the drugs belonged to the subgroup "Other nasal preparations", which included sodium chloride solutions, herbal, homeopathic remedies, and silver preparations. Antiallergics for nasal use were the least represented in SRMP.

The comparative analysis of NPTU in SRMP of Ukraine by INN showed that half of all registered drugs contained xylometazoline (47 trade names or 30.7%) and oxymetazoline (33 trade names or 21.6%). Mometasone, xylometazoline comb., naphazoline and phenylephrine comb. were presented by 9-11 trade names. The rest 16 INNs were part of one to four trade names (Table 2).

Table 2.*Comparative analysis of NPTU in the SRMP of Ukraine by INN*

No	5th level subgroups		Quantity of			
			Trade names		Medical forms	
	ATC code	Name of the subgroup	units	%	units	%
	R01A A07	Xylometazoline	47	30.7	55	27.6
	R01A A05	Oxymetazoline	33	21.6	42	21.1

	R01A D09	Mometasone	11	7.2	19	9.5
	R01A B06	Xylometazoline comb.	10	6.5	12	6.0
	R01A A08	Nafazolin	9	5.9	13	6.5
	R01A B01	Phenylephrine comb.	9	5.9	11	5.5
	R01A X10	Various	9	5.9	16	8.0
	R01A X30	Combinations	4	2.6	3	1.5
	R01A A04	Phenylephrine	3	2.0	3	1.5
	R01A B07	Oxymetazoline comb.	2	1.3	2	1.0
	R01A C01	Cromoglicic acid	2	1.3	2	1.0
	R01A D01	Beclomethasone	2	1.3	3	1.5
	R01A D08	Fluticasone	2	1.3	3	1.5
	R01A A09	Tramazoline	1	0.7	1	0.5
	R01A B02	Naphazoline comb.	1	0.7	1	0.5
	R01A B08	Tuaminoheptane	1	0.7	1	0.5
	R01A C03	Azelastine	1	0.7	1	0.5
	R01A D05	Budesonide	1	0.7	1	0.5
	R01A D58	Fluticasone comb.	1	0.7	2	1.0
	R01A D	Mometasone comb.	1	0.7	2	1.0
	R01A D12	Fluticasone furoate	1	0.7	2	1.0
	R01A D53	Dexamethasone comb.	1	0.7	1	0.5
	R01A X08	Framycetin	1	0.7	1	0.5
Total			153	100	199	100

A study of the quantity of active pharmaceutical ingredients in NPTU showed that almost three quarters of them were one-component drugs (79.7%).

Consideration of the analysed drugs from the standpoint of dosage forms allowed us to indicate that the majority of NPTU released in the form of sprays (60.8%) and drops (34.0%). Some NPTU were in nasal gels (2.6%), powder for preparation of solution for nasal use (2.0%) and balm for inhalation (0.7%).

The analysis by manufacturers revealed that 62.7% of the studied drugs were imported.

At the next stage, we analysed the ways of entering the Ukrainian market by companies with NPTU [3]. It was established that 64.7% of the analysed drugs were manufactured and declared by the same company. However, from two to five enterprises took part in the production of almost one third of these drugs.

Among the contract forms of entering the market, manufacturers delegated the right to register (re-register) the NPTU at the market to another organization (55.6%) (Table 3). Joint production with delegation of registration (re-registration) rights to one of the producers or to a fellow subsidiary of one of the producers was observed in 14.8%

and 11.1% of cases, respectively. Joint production and delegation of registration (re-registration) rights on the drugs to other organization (9.3%) or simply delegation these rights by manufacture to a fellow subsidiary (9.3%) were also existed.

Table 3.

Comparative analysis of NPTU by type of contract form of entering the Ukrainian market

No	Type of contract form of entering the Ukrainian market	Quantity	
		units	%
1.	Joint production with delegation of registration (re-registration) rights on the drugs to one of the producers	8	14.8
2.	Joint production with delegation of registration (re-registration) rights on the drugs to fellow subsidiary of one of the producers	6	11.1
3.	Joint production and delegation of registration (re-registration) rights on the drugs to other organization	5	9.3
4.	Delegation of registration (re-registration) rights on the drugs to fellow subsidiary	5	9.3
5.	Delegation of registration (re-registration) rights on the drugs to other organization	30	55.6
Total		54	100

Only for the fourth part of locally produced NPTU was typical to use a contract form of market entry, in which mainly domestic producers participated. As an exception were Noxprey (the Joint Ukrainian-Spanish company "Sperco Ukraine") and Nazol, Nazol Advance, Nazol Baby and Nazol Kids (produced by Istituto de Angeli S.r.l. (Italy) and registered by "Bayer" LLC (Ukraine)).

Conclusions. At the beginning of 2020, only one third of the subgroups of the fourth level of NPTU in comparison to the list of such subgroups of drugs presented in the Index ATC/DDD was registered at the Ukrainian market. More than half of them contained only two active pharmaceutical ingredients (xylometazoline or oxymetazoline). The majority of NPTU were presented in the form of sprays and drops. More than one third of NPTU were locally produced. Almost two-thirds of producers, most of them foreign, used the contract method of entering the market.

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ASSESSMENT OF THE CONDITION OF TEETH ENAMEL

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Resume. Today, the most common disease, which is most often diagnosed in a dental clinic, is dental caries. Therefore, given the high intensity and prevalence of caries in both children and adults, the study of prevention methods, the likelihood of occurrence and progression of this pathology, the improvement of treatment protocols are important for dentists.

One of the indicators that allows to study the resistance of enamel to caries is the resistance to caries, which is informative for the dentist in order to increase the effectiveness of prevention and treatment of caries of all ages by improving preventive treatment schemes.

An important aspect of prevention is the creation of favorable conditions for the formation of caries resistance of enamel, which, in turn, depends on its chemical composition, physiological and structural features. This is confirmed by the fact that immediately after eruption the enamel is characterized by a low level of mineralization.

It is characterized by low content of calcium, fluorine and phosphorus, as well as high permeability due to the presence of a large number of microcracks and micropores. These features of the enamel provide optimal conditions for secondary mineralization, while increasing the risk of caries. Therefore, caries prevention schemes should take into account the structural and physiological features of the enamel at different stages of its mineralization, and accordingly the question of studying the level of resistance to caries remains relevant in everyday dental practice.

Thus, the resistance to caries of the hard tissues of the teeth depends on age, while the intensity of the carious process is influenced by the conditions of formation of the dental system in the antenatal period of development and in childhood. It is very difficult to control the quality of the formation of the structure of the hard tissues of the teeth at the stage of histogenesis, but to create favorable conditions for secondary mineralization is quite possible and necessary process.

The aim of the study. Analyze the methods of determining the caries resistance of enamel, which are most often used in dental practice. According to various sources of literature, to analyze the physical methods of determining the resistance to enamel caries in order to increase the effectiveness of prevention and treatment of hard tissues of the teeth.

Research methods. Determination of tooth enamel resistance to caries using enamel resistance test (TER - test), CRT (color reaction time) - color reaction time, laser reflectometry, spectrometry, radiation diagnostics, enamel biopsy.

Key words: oral cavity, dental caries, secondary mineralization, TER test, CRT, reflectometry.

Results of the research. Resistance to enamel caries is the resistance of teeth to caries, which under normal conditions is formed among healthy people who are not burdened by the transferred and concomitant diseases and their consequences. In addition, this quality of the hard tissues of the teeth depends on the characteristics of the body and the degree of concern for the health of the oral cavity. It is also important to remember that caries resistance is determined at the genetic level and is inherited. This factor explains why caries often occurs in some people, even with proper nutrition and oral hygiene, and in some - on the contrary, is very rarely diagnosed [4].

Today, to determine the caries resistance of enamel using a variety of research methods that allow informative assessment of the susceptibility of enamel to cariogenic factors. The most widely used physical methods of diagnosis are translumination diagnostics, laser reflectometry, electrometry.

Widely used and one of the first methods of diagnosing this property of enamel is TER - test - is an indirect determination of the depth of the defect of acid erosion of the enamel after its etching with HCL solution [5].

The method is that a drop of 1 mmol / l HCL is applied to the cleaned and dried lip surface of the incisor of the upper jaw at a distance of 2 mm from the cutting edge. After 5 sec. the acid is washed off with distilled water and the tooth is dried. Then apply a drop of 1% aqueous solution of methylene blue, the residue is removed with a dry cotton swab. The intensity of enamel staining is evaluated on a reference scale.

Comparing the color with the standard 10-point scale of blue, you can get a quantitative (in points) assessment of the resistance of tooth enamel caries:

- from 1 to 3 points - acid-etched area has a pale blue color, which indicates a significant resistance of the enamel to caries;

- from 4 to 6 points - blue color, which indicates the average degree of functional stability of the enamel;
- from 7 to 9 points - blue color, which indicates a significant reduction in the stability of the enamel and a high risk of caries.

Enamel stability test scores depend on many factors: medication, stress, exercise, hormonal background, and enamel cerebrospinal fluid as a physiological component of the structural and functional stability of the enamel (SFRE). This does not allow clear and timely formation of caries resistance groups. In this regard, the justification of early clinical methods for predicting resistance to caries at the initial stage of eruption of permanent teeth is of great importance.

Laser reflectometry - determination of the density of the crystal lattice of the enamel surface. This method is based on the differences in the optical properties of resistant and labile enamel: well-mineralized, dense enamel reflects more light and absorbs less (diffusely scatters) [6].

Transillumination diagnosis is a method that allows you to determine the condition of the hard tissues of the tooth. The method is based on the light characteristics of a cold light beam, as a result of which you can see the foci of proximal caries of different depths. The most effective use of this method is observed in the study of the frontal group of teeth.

When diagnosing caries, one of the main problems is to establish the boundary between intact and affected tissue, which further determines the extent of resection of tooth tissue and the nature of its treatment. To date, to solve this problem, there are generally accepted traditional methods of diagnosing carious lesions - electro odonto diagnostics, dental radiography and others. However, these methods are not always informative and sometimes have a limited range of applications [1].

The spectra of healthy and carious teeth are the sum of the spectra of many components. Fluorescent mineral component of the tooth (hydroxyapatite), connective tissue - collagen and elastane, proteins containing tryptophan. Despite the complex picture, the researchers were able to identify some dependence of the spectrum on the stage of the carious process [2].

When diagnosing caries, spectroscopy is often used - a method based on the fluorescent properties of tooth tissues. The difference between the fluorescence of healthy and caries-damaged tissues is due to different light scattering depending on the degree of demineralization. For this type of study is widely used "DIAGNOdent Pen 2190" - a device whose principle of operation is based on different fluorescence of healthy and affected tooth tissues [3].

This device allows you to detect extremely small and hidden areas affected by caries, without the use of X-rays or radiation. The advantages of using this device are:

- 1) rapid painless diagnosis of caries;
- 2) detection of up to 90% of pathological changes in tooth tissue at an early stage;
- 3) use of visual and audible notification signals;
- 4) ease and mobility in use.

Electrometry - determination of the density of the crystal lattice of tooth enamel. The electrical conductivity of enamel is defined as the current in a DC circuit, an element of which is a tooth. The method is based on the ability of carious tissues of the tooth to conduct electric current of different magnitude depending on the degree of their damage [16].

Another method of diagnosing the acid resistance of enamel is a biopsy (determination of lifetime solubility) - a quantitative analysis of the mineral composition (Ca, P) of the enamel, or rather the part of its apatite that reacts with the acid. The method is based on the fact that calcium-saturated enamel can be in relatively large quantities than caries-labile, to give the ions of this element to neutralize the acid, while maintaining the structure of apatite.

Enamel maturation - the process of its mineralization after tooth eruption - is characterized by the penetration of salivary trace elements into the porous structure of the enamel. In this case, one of the common methods for determining the resistance of enamel to acids is the method of acid "biopsy" of enamel. It is characterized by the fact that the enamel is first applied with a 1% solution of hydrochloric acid, and then the biopsy is examined for the presence and quantification of calcium and phosphorus in it. But this method of diagnosis has certain disadvantages, because it has a traumatic effect of concentrated acid on tooth enamel, the complexity of chemical analysis, a long time to get results. The improvement of this method is the development of Kutsevlyak VI, Nikonova VV (patent for a utility model "Method for determining the state of mineralization of tooth enamel", №1532). The principle of the patented method is that the interaction of acetic acid with crystals of hydroxyapatite enamel changes the concentration of H⁺ ions in the direction of its reduction, due to their absorption by the crystal of hydroxyapatite and replacement of Ca²⁺ ions [11].

To do this, the tooth to be examined is cleaned of dental plaque, washed and dried. After that, apply a 1% solution of acetic acid in the area of the equator of the tooth, then - in the area of the neck. The duration of the application is three minutes, and after its completion, the changes in the electrical resistance of the acetic acid solution at its direct contact with the tooth enamel are measured and the results obtained in the equator and cervical region are compared. If the difference exceeds the value of Y_{uom} / s , incomplete mineralization of tooth enamel is noted, and the difference is less than Y_{uom} / s indicates the completion of the mineralization process in the cervical region [7].

Also, the improvement of this research method is the work of Khomenko L.O., Ostapko O.I., Sorochenko G.V., Sorochenko N.O. - development of a utility model (utility model patent №47582, IPC A61B / 1000, G01N 30/96), which consists in determining the degree of mineralization of enamel by etching tooth enamel to the formation of acid erosion, determining the degree of mineralization of the tooth taking into account the depth of acid erosion defect. First, the tooth enamel is etched: on the isolated, cleaned and dried vestibular surface of the incisor, canine or premolar of the upper jaw along its central line at a distance of 2 mm from the cutting edge apply 1 drop of HCl at a concentration of 1 mmol / l, after 5 sec. the acid is washed off and enamel dried with a cotton swab. Then a drop of 1% methylene blue solution is applied to the etched surface, the painted tooth is shielded with white paper and photographed in simulated natural light in macro mode [10].

The area of enamel erosion is painted, and as an indicator of the degree of mineralization of tooth enamel using a digital value of the intensity of the color of the erosion area, which is pre-adapted to the standard 10-point scale TER-test.

Another method of diagnosing enamel caries resistance is a clinical assessment of the rate of enamel remineralization (COSHRE test) - a method of determining the resistance of tooth enamel to caries, which can be used at different ages from 6 years [9].

To conduct it, first prepare an acid buffer with a pH of 0.49 and a 2.0% solution of methylene blue. The enamel surface of the examined tooth is thoroughly cleaned of plaque, using hydrogen peroxide, dried. Next, a drop of hydrochloric acid buffer with a pH of 0.49 is applied to the enamel surface with a glass rod and kept for 60 s, after which it is removed with a cotton swab. On the etched area of the enamel for 60 s apply a cotton ball impregnated with 2.0% solution of methylene blue. Then it is removed and the excess paint is carefully removed (use only dry cotton swabs). If necessary, if the plaque was poorly removed, the tooth surface is cleaned again. Carrying out these manipulations is important, as excess paint and stained plaque can lead to misinterpretation of the data [13].

The susceptibility of enamel to the action of acid (demineralization process) is assessed by the intensity of staining of the etched area of tooth enamel, the degree of which is determined on a ten-point scale. A day later, re-staining the etched area of tooth enamel, without re-applying the solution. If the etched area of tooth enamel is stained, this procedure is repeated again in a day. The loss of the ability of the etched area to be painted is regarded as its complete restoration. In each patient, the etched area of tooth enamel is restored at different times, so this indicator evaluates the remineralizing properties of saliva [12].

When using this method of diagnosis, the degree of susceptibility of tooth enamel to the action of acid is expressed as a percentage, and the remineralizing ability of saliva - in days. Caries-resistant people are characterized by low susceptibility of tooth enamel to acid (below 40%) and high remineralizing ability of saliva (from 24 hours to 3 days), and for caries-prone - high susceptibility of tooth enamel to acid (above or equal to 40.%) and low remineralizing ability of saliva (more than 3 days).

CRT (color reaction in time) - a color indicator in time), which can be used to assess the degree of acid resistance of tooth enamel. When using this method, the left or right incisor is usually examined. The vestibular surface of the tooth is thoroughly cleaned of plaque, dried with warm air and isolated from saliva. Then put the indicator paper with a diameter of about 2 mm, which is impregnated with an automatic micropipette 1.5 μm of hydrochloric acid (1 mol / l), after which the time is recorded. The indicator paper should change color from light green to pink-purple. The time elapsed from the moment of application of the acid to the change of color of the indicator, and is the same color indicator of the resistance of the enamel to acids. The longer the color reaction time (in CRT), the higher the resistance of the enamel and the lower the likelihood of carious lesions [15].

One of the informative methods for diagnosing enamel caries resistance is the method of computer X-ray microtomography m CT-test, which is a combination of tomographic algorithms and X-ray microscopy, which allows to obtain information about the microstructure of dental hard tissues without their destruction based on physical density assessment [14].

The method of determining the acid resistance of the enamel by estimating the depth of the acid microdefect (patent for a utility model "Method for determining the acid resistance of tooth enamel", №7716; Udod OA), in which the assessment of the acid defect is carried out in vivo, on the enamel surface, and then exposed to a low-intensity helium-neon laser and fix the intensity of the reflected light from the microrelief of the tooth enamel. The device required for this study consists of a helium-neon laser, fiber, photodetector, EMF recorder. The vestibular surface of the examined tooth is thoroughly cleaned of plaque, washed and dried. Acid etching of enamel with 1% hydrochloric acid

solution with exposure to 30c is carried out, after which the acid is thoroughly washed, the tooth is isolated and dried. Then use the described device [8].

Conclusions. According to the results of the analyzed sources of literature, it becomes clear that the level of resistance to caries signals the possibility of tooth enamel to resist the caries process. Therefore, the study of this property of enamel is important for the prediction of caries and timely application of preventive measures.

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ANAL MANOMETRY AND TOTAL INDEX OF ENDOGENOUS INTOXICATION IN THE DIAGNOSIS OF ACUTE APPENDICITIS

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Annotation. The purpose of the study was to improve the effectiveness of the diagnosis of acute appendicitis in children through the use of anal manometry and the total index of endogenous intoxication.

Materials and discussion of the study.

The study on the measurement of anal pressure included 60 girls who were hospitalized in the surgical departments of the Vinnytsya Regional Children's Clinical Hospital (Ukraine). Female children aged 3 to 17 years were examined. Abdominal pain, mainly in the lower extremities, was the main reason for seeking medical help. For anal manometry, patients were divided into three equal groups – 20 children each. The first group consisted of girls who were hospitalized with suspected acute appendicitis, but in the course of further examination and observation, acute surgical pathology was excluded. The second group included girls who underwent surgery for acute appendicitis. Girls of this group were not found peritonitis. The third group consisted of girls who underwent surgery for acute appendicitis and had peritonitis of varying severity. The study of endotoxiosis consisted of peripheral blood analysis in 400 children with suspected acute appendicitis, whose average age was 12.6 ± 1.2 years, resulting in a significant relationship between the level of endotoxiosis and the inflammatory process in the abdominal cavity.

Research results.

In the study, we have proven a significant direct proportional increase in the indicators of rectal sphincter tone and the level of endogenous intoxication in relation to the inflammatory process.

Conclusions.

Anal manometry method shown in the study clearly demonstrates the dependence of the tone of the rectal sphincters with the degree of spread of the inflammatory process.

Exceeding the value of the proposed total index of endogenous intoxication of the body more than twice indicates the child has the level of endotoxiosis characteristic of destructive forms of acute appendicitis, exceeding the index more than 2.5 times indicates

a possible complicated pathology in the form of peritonitis. The introduction of the developed total index of endogenous intoxication in the algorithm of acute appendicitis will improve the results of early diagnosis and predict the form of pathology and its nature in children.

Key words: measurement, acute surgical pathology, children, endogenous intoxication, index.

Introduction.

Acute appendicitis is one of the most common acute surgical diseases of the abdominal cavity in children. About 65–75% of surgical interventions in pediatric surgery account for acute appendicitis, which is due to the peculiarities of functional and morphological processes of the child's body, the rapid development of destructive processes [1,2,3–5].

Returning to the history of emergency surgery, the first known case of appendix removal surgery in pediatric practice is considered to be surgery performed by British surgeon K. Amiand on December 6, 1735. The procedure was performed on an 11-year-old patient with inguinal hernia perforated by metal pin appendix. The appendix along with the foreign object was removed, and the hernia containing the appendix has since become known as the Amiand's hernia [3].

Due to the emergence of scientific and technological progress in medicine and the introduction of new medical and diagnostic cases, the number of deaths associated with acute appendicitis has decreased significantly compared to the XIX century. However, even with the advent of high-tech tools, the surgeon's work with patients with abdominal pain remains very difficult. Acute appendicitis is one of the most common causes of pathological conditions of "acute abdomen" in children. The cause of acute appendicitis is still unknown. Only in some cases, macroscopically during surgery, you can detect fecal stones or the presence of helminths in the lumen of the appendix. Histological examination usually reveals epithelial hyperplasia, vascular thrombosis and other changes that may lead us to the cause of inflammation in the appendix. In children, appendicitis is one of the most common causes of laparotomy. This is due to the functional and morphological features of the processes of the child's body, the generalization of inflammatory processes, the severity of intoxication, the rapid development of destructive processes [4].

The problem of timely diagnosis of acute appendicitis in children of different ages remains one of the unresolved in the provision of urgent surgical care. Usually to clarify the diagnosis it is necessary to use additional laboratory and instrumental methods of research – general blood and urine tests, ultrasound, computed tomography of the abdominal cavity, the indicators of which are necessary for pediatric surgeons [6]. However, even the use of high-tech tools and considerable clinical experience does not always help in the timely recognition of acute surgical care.

In patients with acute appendicitis, especially in complicated cases, the presence of intoxication in the body is of great importance. Determination of integrated indicators of endotoxemia allows to assess the patient's condition without involving special research methods, according to the general clinical blood test [7]. The development of a new available algorithm for the diagnosis of acute appendicitis, which would take into account the integrated indicators of the hemogram and would allow in a short time to

decide on the feasibility of appendectomy, remains an unsolved problem of pediatric surgery.

The purpose of the study was to improve the effectiveness of the diagnosis of acute appendicitis in children through the use of anal manometry and the total index of endogenous intoxication.

Materials and discussion of the study.

The study on the measurement of anal pressure included 60 girls who were hospitalized in the surgical departments of the Vinnytsia Regional Children's Clinical Hospital (Ukraine). Female children aged 3 to 17 years were examined. Abdominal pain, mainly in the lower extremities, was the main reason for seeking medical help. For anal manometry, patients were divided into three equal groups – 20 children each. The first group consisted of girls who were hospitalized with suspected acute appendicitis, but in the course of further examination and observation, acute surgical pathology was excluded. The second group included girls who underwent surgery for acute appendicitis. Girls of this group were not found peritonitis. The third group consisted of girls who underwent surgery for acute appendicitis and had peritonitis of varying severity. All patients and their parents had previously obtained informed voluntary consent for anal manometry after being acquainted with the method of anal manometry. Anal manometry was performed immediately after rectal examination, which is mandatory in children with suspected acute appendicitis according to clinical protocols in Ukraine. Anal manometry was performed in the position of the child on his back. The WPM Solar device (MMS, Holland) used in the study consisted of a sensitive balloon with electrode, a computing module that was connected to a personal computer (Fig. 1).



Fig. 1. Device for measuring the tone of the rectal sphincters WPM Solar (MMS, Holland).

Before inserting the sensitive balloon into the rectum, the anal area was and the balloon was lubricated with a solution of Vaseline to reduce soft tissue resistance and reduce discomfort during the procedure. The procedure was performed without general and local anesthesia, because the diameter of the sensitive balloon does not exceed the diameter of an adult's finger and does not cause significant pain. The balloon with the sensor was inserted into the rectum to a depth of 3 cm in order to install it in the lumen of the anal sphincter (Fig. 2).



Fig. 2. Procedure for measuring anal pressure by inserting a sensitive balloon into the lumen of the sphincter.

Immediately after the introduction of the balloon, the value of the manometer in millimeters of mercury was recorded. The first indicator, the so-called reactive pressure, is an indicator that includes passive sphincter tone, as well as active conscious contraction of the sphincters in response to the balloon. To obtain the second, more important indicator (basal pressure), which takes into account only the passive tension of the sphincter muscles, it is necessary to hold the balloon in the lumen of the sphincter for 60 seconds. It is during this time that the sphincter pressure adapts to the balloon and significantly reduces the element of active tension of the striated muscles of the sphincter apparatus.

The diagnostic procedure was completed by determining the basal pressure. Measuring basal pressure is a more important indicator than measuring reactive pressure, because basal pressure more objectively reflects the constant tension of the sphincter muscles at rest. It is the basal pressure that reflects the nonspecific response of the sphincter apparatus to pain, and hence the inflammatory response, in the abdominal cavity or in the pelvic cavity by the mechanism of the visceromotor reflector. After the procedure, the device was cleaned and sanitized by disinfection in an antiseptic solution.

Statistical processing was performed using the computer program MS Statistica 5.0.

Research results. In the course of our study, the following indicators were identified. In children of the first group, the average value of reactive anal pressure was observed at the level of 59.65 ± 2.11 mm Hg, the average basal pressure was 50.35 ± 2.53 mm Hg. In patients of the second group, the data of sphincterometry were as follows. The average value of the reactive pressure was at the level of 89.1 ± 3.27 mm Hg, after holding the balloon in the lumen of the sphincter, the pressure decreased to its basal level, the average value of which was 70.7 ± 1.94 mm Hg. The highest value of mean anal pressure, compared to previous groups, was observed in the third group. The average value of anal pressure had the following indicators: reactive pressure - 106.4 ± 4.3 mm. rt. art., basal pressure - $77.85 \pm 2,81$ mm Hg. The overall mean value for patients with acute appendicitis was 97.75 ± 3 mm Hg. - reactive and 74.28 ± 1.78 mm Hg. - basal.

Based on the results of the study, a certain pattern was found, characterized by an increase in both reactive and basal, which is directly proportional to the degree of inflammatory process in the abdominal cavity (Table 1).

Table 1.

The level of anal pressure in children hospitalized with abdominal pain.

Type of anal pressure	Group I (mm Hg)	Group I (mm Hg)	Group I (mm Hg)	P
Reactive	$59,65 \pm 2,11$	$89,1 \pm 3,27$	$106,4 \pm 4,3$	p1<0.01 p2<0.01
Basal	$50,35 \pm 2,53$	$70,7 \pm 1,94$	$77,85 \pm 2,81$	p1<0.05 p2<0.01

Note: p1 - reliability of comparison of results between I and II groups;

p2 - reliability of comparison of results between I and III groups.

However, given the above indicators, it should be noted a significant difference between the indicators in patients with acute appendicitis and patients in whom acute surgical pathology was excluded during the examination and dynamic monitoring. It is this difference in pressure that helps in resolving the issue of surgical tactics for the patient. Indicators between groups II and III were not so significant differences. The difference between mean basal pressures in patients of the last two groups was less than 10 mm. rt. Art. The difference between the indicators of groups II and III is not so clinically important, because patients from these groups were diagnosed with acute appendicitis, and therefore they underwent emergency surgery in any case.

Female patients (400 girls) aged 1 to 17 inclusive were involved in the analysis of endogenous intoxication indicators, on the basis of Vinnytsia Children's Regional Clinical Hospital (Ukraine), which was divided into 4 groups (100 children per group): Group I - actually healthy children; Group II - patients with abdominal pain in whom after further research surgical pathology was excluded; Group III - patients operated with destructive forms of acute appendicitis, without peritonitis; Group IV - patients operated with destructive forms of acute appendicitis with peritonitis. Children with catarrhal forms of acute appendicitis were not included in the study. The mean age of patients was 12.6 ± 1.2 years.

Taking into account the data and information reports of other researchers, we proposed a total index of endogenous intoxication (TIEI), which took into account all components of the general blood analysis, and which was calculated by the formula

$$TIEI = \left(\frac{L \times ESR}{100} + \frac{(e + bas + ban + s + j + myel)}{(mon + lym)} \right) / 2,$$

L - the number of leukocytes; ESR - erythrocyte sedimentation rate; e - eosinophils; bas - basophils; ban - band neutrophils; s - segmented neutrophils; j - juvenile neutrophils; myel - myelocytes; mon - monocytes; lym - lymphocytes. TIEI normally averages is 1.42 ± 0.06 c. u.

The study of the value of TIEI in various forms of pathology has determined the presence of positive dynamics. The total index of endogenous intoxication was 1.42 ± 0.06 ($p < 0.05$) in patients of the first group. In group II, the index level was 2.31 ± 0.32 ($p < 0.05$). The value of the total index of endogenous intoxication was 3.52 ± 0.45 ($p < 0.05$) in patients of group III. In children of group IV, the total index of endogenous intoxication was 3.80 ± 0.31 ($p < 0.05$).

The presence of such a positive dynamics of the total index of endogenous intoxication indicates the presence and increase in the value of endogenous intoxication with the growth of tissue destruction, which is regarded as a direct sign of intoxication.

Conclusions.

Therefore, after conducting a clinical study, which involved measuring the anal pressure of the sphincters in various pathologies of the abdominal cavity and pelvic organs, we can say about the feasibility of using this technique in the practice of surgeons. The above method demonstrates a fairly high informativeness. Therefore, it can be used as an additional element of diagnosis in complex clinical cases, especially in girls with overweight, cases with atypical location of the appendix, and atypical course of the disease. This method clearly demonstrates the dependence of the tone of the rectal sphincters with the degree of spread of the inflammatory process in the abdominal cavity and pelvic cavity.

An new approach to the interpretation of endogenous intoxication according to general blood analysis based on the value of the total index of endogenous intoxication allows to assess the severity of endotoxiosis, based on which it is possible to predict the form of pathology and timely choose the necessary treatment tactics. Exceeding the value of the proposed total index of endogenous intoxication of the body more than twice indicates the child has the level of endotoxiosis characteristic of destructive forms of acute appendicitis, exceeding the index more than 2.5 times indicates a possible

complicated pathology in the form of peritonitis. The introduction of the developed total index of endogenous intoxication in the algorithm of acute appendicitis will improve the results of early diagnosis and predict the form of pathology and its nature in children.

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RADICALISM OF THE OPERATING FIELD IN THE REMOVAL OF PIGMENTED NEVI IN CHILDREN

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Annotation. The purpose of the study - to increase the efficiency of determining the degree of radicalism in the removal of pigmented skin nevi in children, taking into account the thickness of the hypodermis in different anatomical parts of the body.

Materials and methods of research.

The work was performed on the basis of the Department of Oncohematology of Vinnytsia Regional Children's Clinical Hospital in the period from 2018 to 2020. The clinical distribution of features of surgical interventions for skin pigmented nevi included analysis of medical records of outpatients and inpatients (120 documents). The age of patients of both sexes ranged from 3 to 16 years. Patients with localization of pigmented neoplasms in different areas were analyzed.

Results. The model for calculating the planar parameters of the surgical wound is based on the ratio of the size of the removed tissues in the form of ellipses at the level of the skin and at the level of the deep fascia, taking into account the thickness of the hypodermis. For a more simplified perception of the logic of the calculation, the shape of the operating space is proposed to be considered as a cone.

Geometrically, the computational model is in the form of a triangle, the vertex of which unfolds at an angle of 25° , and which is an inverted by 180° analogue of classical angle of operational action.

Conclusions. The proposed method of determining the radicalism of removal of pigmented skin nevi by mathematical calculation of the ratio of areas of removed tissues at the skin level and at the level of the aponeurosis taking into account the thickness of the hypodermis in different parts of the body allows to calculate individual surgical wound parameters. Due to the large number of pigmented nevi of different localization in childhood and a careful approach to determining the indications for surgical treatment in the last decade there has been an extensional annual increase in the number of operated children.

Key words: operating field, benign neoplasms, incision.

Introduction.

The term "nevus" (latin – birthmark, scar) was first used by R. Virchow (1863) to designate birthmarks of the skin. A broader interpretation was provided by J. Jadasson (1914), including malformations and some benign skin tumors in this group. The true meaning of the term "nevus" implies the presence of melanocytes or nevus cells in neoplasms. All variants of natural nevi are derivatives of melanocytes, melanin-producing cells, which explains the color of the neoplasms, which, according to the WHO classification, belong to hamartomas, which confirms their dysembryonic origin [7].

In general, the pigmented nevus combines a number of hamartomas of the skin with general clinical and histological signs; these are malformations that are formed by mature or almost mature components of the epidermis, sebaceous glands, hair follicles, apocrine and exocrine sweat glands and their combinations. Pigmented nevi in 80% of cases are observed in the first year of life and are sporadic. Melanocyte neoplasms of the skin attract the attention of specialists primarily due to their high prevalence, but also because this group of diseases includes melanoma of the skin, which often develops from a benign pigmented neoplasm – nevus [3,17]. Congenital melanocyte nevi are found in 1% of newborns [12]. Particular attention is paid to dysplastic nevi, which include epidermal and mixed nevi, the diameter of which exceeds 5 mm with an uneven distribution of pigment on the surface and fuzzy contour [7]. According to some authors, melanoma of the skin in children occurs in 20% of nevi of small and medium size [2,3,11,16].

Often, due to the apparent simplicity of surgical treatment of pigmented skin nevi, simplified medical manipulations are used, which negatively affects the course of the disease and long-term results, one of which is the recurrence of the disease [13]. The world literature provides various data on the frequency of recurrences after treatment of pigmented nevi, the rate of which ranges from 6% to 41% [8,9]. In the domestic literature, the recurrence rate is given within 20% [10].

In addition, in the practice of surgeons and oncologists there are cases when in the area of removal of pigmented nevi there are foci of pigmentation [15,16]. In the WHO classification, such nevi are classified as "persistent melanocytic nevus", ie "prolonged nevus growth", which is a complicated course of the disease, which by its histogenesis is a separate form of pathology that does not correspond to a pure recurrence of the tumor [1,6,14]. In order to improve the results of surgical treatment of skin neoplasms using techniques of surgical excision of skin with tumor, adipose tissue and adjacent fascia in a single block at an obtuse angle to the wound base, which increases the volume of excised fat and lymphatic capillaries compared to traditional approach [5].

But when determining the ratio of the area of the excised skin flap to the area of tissues at the level of the fascia, their correlation with the thickness of the hypodermis is not taken into account, the size of which varies in different parts of the body, which in turn reduces the radicalism of the intervention.

Therefore, given the significant percentage of negative consequences of treatment of pigmented nevi in due to the large number of recurrences, lack of a single view on surgical tactics of radical removal of tumors, an attempt was made to determine the feasibility of radical treatment of pigmented tumors.

The purpose of the study – to increase the efficiency of determining the degree of radicalism in the removal of pigmented skin nevi in children, taking into account the thickness of the hypodermis in different anatomical parts of the body.

Materials and methods of research.

The work was performed on the basis of the Department of Oncohematology of Vinnytsia Regional Children's Clinical Hospital in the period from 2018 to 2020. The clinical distribution of features of surgical interventions for skin pigmented nevi included analysis of medical records of outpatients and inpatients (120 documents). The age of patients of both sexes ranged from 3 to 16 years. Patients with localization of pigmented neoplasms in different areas were analyzed.

Research results and their discussion.

The hypothesis of the study was to calculate the ratio of skin area, together with the pigmented tumor, in children to the area of the removed hypodermis at the level of the aponeurosis. In implementing this hypothesis, the data obtained in recent years on the features of anatomical structures, which are located between the dermis, deep fascia and aponeurosis, were taken into account. This approach is due to the fact that the architecture of the vascular component of the hypodermis is very interesting for oncologists due to the persistent course of pathology, the possibility of metastasis of tumors and subsequent prognosis of the disease.

Thus, in ultrasonic lipodestruction, without damage to ultrastructures, after evacuation of destroyed tissues to the level of the aponeurosis, it was determined that only up to 2/3 of connective tissue strands and vessels of the skin with a pronounced network of collaterals have a vertical direction, and the rest are located diagonally or horizontally most of which have a flat structure. Most vessels in the hypodermis are located in the connective tissue membranes, but are connected by collaterals. Thus, the presence in the hypodermis of a pronounced vascular-depositing structure, can ensure its direct participation in pathological processes associated with recurrence and generalization of pigmented skin tumors [4].

Usually, the retreat from the visible borders of the tumor range from 1.0 to 2.0 cm. Відповідно до According to the International Standard ESMO (European Society of Medical Oncology, 2004), treatment of local stages of melanoma of the skin should be performed with extensive excision of the primary tumor within healthy tissues with excision of the edges of the tumor base: 0.5 cm – for melanoma in situ; 1.0 cm – with a tumor thickness of 1 – 2 mm according to Breslow; 2.0 cm – with a tumor thickness > 2 mm, but <4 mm; in primary tumors with severe invasion > 4 mm thick, an indentation greater than 2.0 cm may be recommended [18]. Along with a sufficient retreating from the edges of the pigment formation, the depth of excision of the tumor from the underlying tissues is important. The standard of oncological radicalism is considered to be surgery in which a sufficient block of tissues is excised, consisting of skin, subcutaneous tissue and fascia. This volume guarantees the success of the operation in most cases. Given the above effect of the principle of divergent segmental blood flow and lymphatic outflow in the form of a triangle with a vertex in the center of the tumor, removal of equal volumes of tissue at the levels of superficial and deep fascia should not be considered as radical intervention. Therefore, it is logical to make incisions in the skin and underlying soft tissues not at right angles, but at a certain obtuse angle, which provides a smaller volume of excised skin than the volume of removed fascia and adipose tissue with vessels passing through them.

Another component of the research hypothesis was the determination and evaluation of the values of certain components of the adequacy of surgical access.

In miniinvasive operations, the depth prevails over the length, which accordingly creates limited conditions when performing the operation.

The observation axis is an image transmission line that connects the surgeon's eye and the object of surgery, which in miniinvasive procedures is not necessarily a straight line, but may consist of several segments of straight lines, be curved, have a complex shape or even have virtual areas. An important condition is that the axis of direct observation of the object under any conditions must remain free and not overlap with tools.

The axis of the operation, which has the form of a line of transmission of physical actions from the hands of the surgeon to the object of operation, can also have the form of a complex trajectory. The longer and more complex the trajectory, the more difficult it is to perform surgery. Given the small size of operational access, the axes of observation and operational action do not coincide, and in some areas may be located in parallel, not overlapping each other.

Minimally invasive surgical interventions are characterized by limited surgical access, as a result of which only certain parts of anatomical formations remain accessible, which largely determines the success of the intervention.

Miniinvasive interventions are characterized by the shape of the operating space in the form of a «cone», «tube» or «retort flask», which is characterized by a wide base. Such forms of operating space are not accidental, but the most appropriate, as their volume is several times greater than its cylindrical counterpart, which provides greater freedom in surgical manipulations, allowing to maximize the space located directly above the area of access (the more the free space, the easier it is to operate). Expanding this part of the access 2 times increases the area of the accessibility zone in 4 times, and the volume of the adjacent part of the free operating space increases 8 times. Thus, the form of access with increasing its area at the level of the aponeurosis provides maximum freedom of operation in the area of accessibility with a minimum amount of operating space, and accordingly the minimum area of contact of instruments with tissues. Angles of surgical action are important criteria for assessing the adequacy of surgical access and freedom of operation. Sufficient access width is determined by the classical angle of operational action (CAOOA), which is formed by lines connecting the outer edges of the operative section and a specific point of the object of operation. Adequate conditions for surgical intervention are provided by the value of $CAOOA \geq 25^\circ$ [13], (Fig. 1).

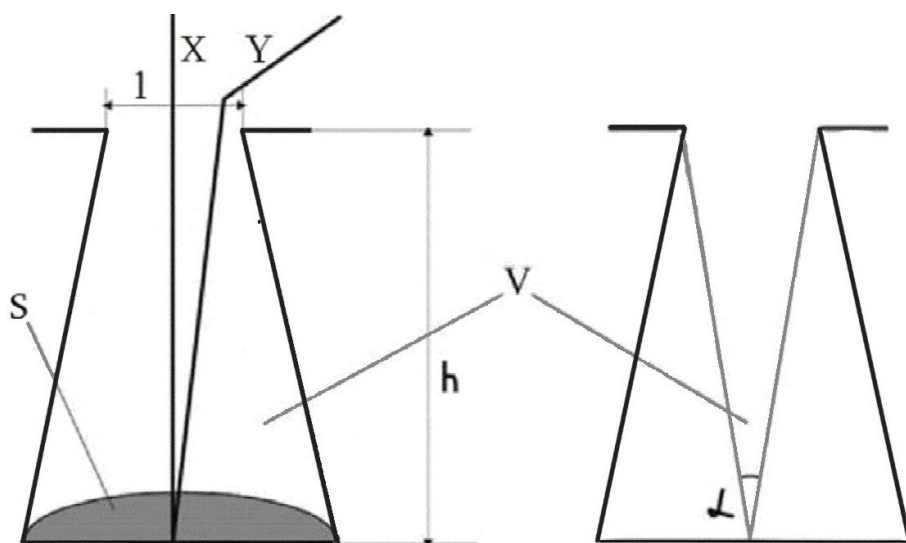


Fig. 1. Criteria for assessing the availability of minimally invasive procedures: 1 – the length of the wound; X – axis of observation; h – depth of the wound; S – accessibility area; V – volume and shape of the surgical wound; Y – the axis of operational action; α – the angle of operational action.

In determining the factors of the mathematical model for calculating the parameters of the surgical wound, radical removal of pigmented nevi took into account the fact that in most clinical cases the contour of the pathological formation approaches the oval, so the contour of the skin incision, taking into account the corresponding retreat from the tumor.

The area of the ellipse is equal to the product of the lengths of the major and minor half-axes by the π and is calculated by the formula

$$S = \pi \times a \times b \quad (1),$$

a – the length of the greater half-axis of the ellipse; b – the length of the smaller half-axis of the ellipse; π is equal to the value of 3.1415.

Based on this, the model for calculating the planar parameters of the surgical wound is based on the ratio of the size of the removed tissues in the form of ellipses at the level of the skin and at the level of the deep fascia, taking into account the thickness of the hypodermis. For a more simplified perception of the logic of the calculation, the shape of the operating space is proposed to be considered as a cone.

Geometrically, the computational model is in the form of a triangle, the vertex of which unfolds at an angle of 25° , and which is an inverted by 180° analogue of CAOAA (Fig. 2).

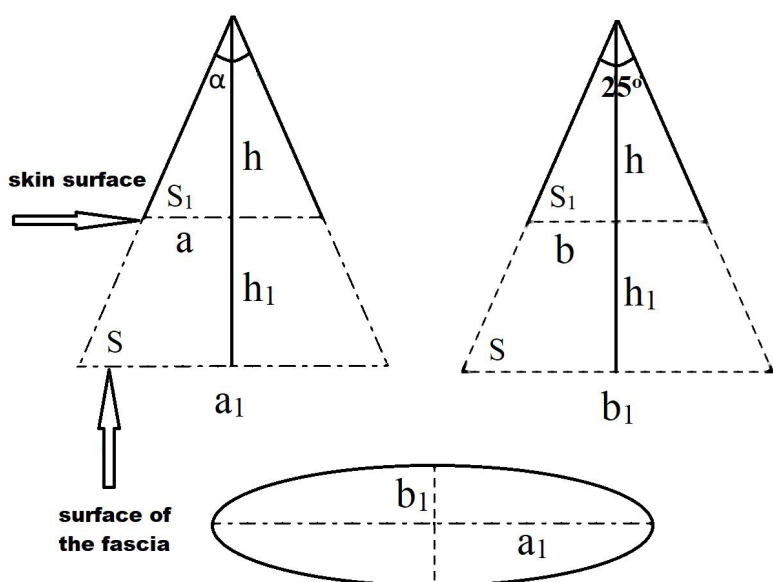


Fig. 2. Image of the calculation model for calculating the parameters of the surgical wound in two perpendicular directions, where: a – larger diameter of the ellipse at the level of the skin; b – the smaller diameter of the ellipse at the level of the skin; h_1 – depth of the wound; α – viewing angle (25° , this is the angle of the triangle, the base of which is a smaller diameter of the fascia; in a triangle with a larger base of the fascia, the angle will be greater than 25°); S_1 – area of the wound at the level of the skin; S is the area of the wound at the level of the fascia.

Taking into account the parameters of the factors of the surgical wound, we determine the larger diameter of the ellipse at the level of the fascia by the formula

$$a_1 = a \frac{h_1 + h}{h} - \text{greater length of the semi-axis of the ellipse at the level of the fascia; (2)}$$

the smaller diameter of the ellipse at the level of the fascia is determined by the formula

$$b_1 = b \frac{h_1 + h}{h} - \text{shorter half-length of the ellipse at the level of the fascia (3)}$$

The review height of the surgical wound was determined by the formula

$$h = \frac{b}{g \frac{\alpha}{2}}$$

(4) Adapting formulas (2) and (3) to formula (1) taking into account the indicator of the height of the review (formula 4) we obtain the calculated formula of the area (S) of the wound at the level of the fascia in the form of the following calculation

$$S = \pi \times \frac{a_1 \times b_1}{4},$$

(5) By entering individual linear indicators of a specific tumor into formula 5, which was integrated into a universal program for working with Microsoft Excel spreadsheets, we quickly and accurately obtain the necessary calculations during radical surgery to remove pigmented skin nevi due to their different localization.

The use of the proposed calculation model in the treatment of 120 patients with pigmented nevi for the period 2018 – 2020 allowed to avoid recurrence of the pathology in all cases.

Conclusions.

1. Increasing the radicalism of surgical operations during the removing pigmented tumors is not only a sufficient retreat from the visible boundaries of the tumor, but also an adequate amount of removed subcutaneous fat, blood vessels and fascia, which have their own anatomical and topographic features.

2. The proposed method of determining the radicalism of removal of pigmented skin nevi by mathematical calculation of the ratio of areas of removed tissues at the skin level and at the level of the aponeurosis taking into account the thickness of the hypodermis in different parts of the body allows to calculate individual surgical wound parameters.

The research was carried out in accordance with the principles of the Declaration of Helsinki. The study protocol was approved by the Local Ethics Committee of all institutions mentioned in the work. Informed consent of parents and children was obtained for the research. The authors declare no conflict of interest.

3. Due to the large number of pigmented nevi of different localization in childhood and a careful approach to determining the indications for surgical treatment in the last decade there has been an extensional annual increase in the number of operated children. Indications for surgical removal of pigmented nevi in childhood should be based on clear clinical dynamic signs, primarily taking into account the localization in functionally active areas. In order to prevent the persistent growth of pigmented nevi of any size, it is advisable to excise them within healthy skin in a circle to the fascial layer with simultaneous irradiation with a laser coagulator.

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COGNITIVE IMPAIRMENT FEATURES AND LIFE QUALITY ASSESSMENT OF PATIENTS WITH CHRONIC VIRAL HEPATITIS C

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Summary. Worldwide, more than 71 million people are infected with the hepatitis C virus (HCV), which accounts for about 1.0% of the world's population. One of the main complications of this pathology is the central nervous system defeat with the

development of varying severity disorders. This leads to the fact that hepatotropic viruses affect the life quality and mental state of patients. Thus the dynamic increase in chronic viral hepatitis C disease (HCV) in different regions of Ukraine and around the world necessitates the more detailed study of cognitive impairment in patients. In order to establish compliance of doctors and patients with HCV to improve the life quality of patients, as well as to prevent the spread of the disease.

21 persons were examined: 11 patients with a diagnosis of HCV at the age of (60.81 ± 10.16) years, who underwent inpatient treatment based on Communal Institution of Sumy City Council «Medical Clinical Center of Infectious Diseases and Dermatology named after Z. Krasovitsky» and 10 practically healthy persons aged (60.3 ± 7.49) years. Special scales and techniques were used to analyze cognitive impairment and assess life quality.

Lower indicators of the psychological health component were found in patients with HCV than in practically healthy individuals ($p < 0.05$), which is justified by the social stigma of patients with HCV. Attention deficit, fatigue, decreased abstract thinking, and delayed reproduction of information have been reported by patients with HCV. They were most characterized by anxiety (distrust of doctors, meticulousness of information, concealment of complaints), anosognostic (rejection of thoughts about the disease, attributing symptoms to accidental circumstances, refusal of examination and treatment), sensitive types of the internal picture of the disease (fear of becoming a burden, excessive shyness).

Based on the obtained data on cognitive impairment in patients with HCV, an “Algorithm for providing medical care to patients with HCV according to their cognitive characteristics” was developed to improve the quality of communication between physicians and patients with HCV.

Keywords: viral hepatitis, liver disease, cognitive disorders, chronic viral hepatitis C.

Introduction. Hepatic encephalopathy (HE) is the main manifestation of central nervous system (CNS) damage in patients with liver cirrhosis of various etiologies, including HCV. It is a potentially reversible neuropsychiatric syndrome with symptoms ranging from the absence of clinical disorders - minimal hepatic encephalopathy (MHE) to severe attention deficit and excitation disorders - overt hepatic encephalopathy (OHE). In addition, a large number of neurological complications occur in patients with HCV regardless of liver disease, including metabolic, inflammatory and autoimmune conditions that affect the CNS, as well as the peripheral nervous system and muscles.

MHE is defined as the presence of testosterone brain dysfunction in patients with chronic liver disease who are not disoriented and do not have asterixis. MHE is clinically relevant because it affects the quality of life and performance of patients with chronic liver disease, and because it is a recognized risk factor for OHE.

Cognitive dysfunction in patients with HCV is a clear form of MHE. Most patients with HCV, regardless of the assessment of the degree of liver fibrosis, detect changes in verbal learning, attention, executive function, and memory when assessed by appropriate neuropsychological tests. The similarity between cognitive dysfunction in patients with HCV and MHE of patients with different etiologies is unclear. It is also unknown how metabolic changes in liver disease interact with cognitive dysfunction caused by HCV and whether these manifestations decrease after antiviral therapy.

Chronic diseases are usually associated with reduced quality of life, as reported by patients, although the means of measuring such aspects have obvious limitations. Existing self-completion questionnaires generate different scores according to different categories, such as general and mental health, social and physical functioning, pain, vitality and disease impact.

There are no life quality rating scales specifically designed for infected HCVs. SF-36 or its short version SF-12 is commonly used, as these methods have largely demonstrated the high accuracy of detecting the life quality deterioration in a wide range of chronic diseases. More than half of patients with HCV complain about fatigue, exhaustion, impaired concentration and memory, which are known to negatively affect the quality of life at least as much as physical symptoms. Patients also report a decrease in quality of life, which often does not depend on the severity of liver damage or the rate of virus replication. Fatigue, cognitive dysfunction and mood swings have a profound effect on social and physical functioning, which further affects the quality of life.

According to the literature, lower quality of life was described by patients with HCV compared with hepatitis B virus-infected patients and healthy controls. In addition, these findings are not solely related to the psychological effect of awareness of HCV positive status, as patients who are unaware of the infection perform better than patients who know their HCV status but worse than healthy individuals.

The study aims to develop an algorithm for communication between physicians and patients with chronic viral hepatitis C based on certain cognitive impairments and quality of life in patients.

Patients and methods.

In the research 21 persons have been examined: 11 patients with a diagnosis of HCV at the age of (60.81 ± 10.16) years, who underwent inpatient treatment based on Communal Institution of Sumy City Council «Medical Clinical Center of Infectious Diseases and Dermatology named after Z. Krasovitsky» and 10 practically healthy individuals age (60.3 ± 7.49) years.

The research was performed in compliance with international and national legislation on ethics following the requirements of the Law of Ukraine of 23.09.2009 № 690 «On approval of the procedure for clinical trials of drugs and examination of clinical trial materials and standard regulations of the ethics commission.» All patients and healthy individuals in the control group received informed consent to participate in the study under the Helsinki Declaration of the World Medical Association «Ethical principles of medical research with human participants as the object of study.»

To assess cognitive impairment and patients' life quality, an anonymous and confidential survey was conducted using number search techniques (Schulte tables) and «Simple analogies», a short scale for assessing the mental status of Mini-Cog, SF-36 quality of life questionnaires, «Bekhterev Institute personal questionnaire».

Statistical processing of results using Microsoft Office software package, Mann-Whitney U-test were used.

Results. Among the examined patients and in the reference group, men were 2.7 times less (respectively 27.27%, 30.00%) compared to women (72.72%, 70.00%).

Questionnaires were conducted and the results were analyzed for the physical component of health (assessment of physical and role functioning due to physical condition; the intensity of pain; general health) and psychological (assessment of vital activity; social functioning; role functioning due to emotional state; mental health 'I).

After the analysis of the questionnaire on the scale of physical functioning, which reflects the possibility of performing certain types of loads, for the studied group the total score was (77.27 ± 6.72) , and for almost healthy individuals - (82.50 ± 5.12) ($p = 0.135$). The indicator of role functioning due to physical condition, which indicates the influence of well-being on daily role activity, for those infected with hepatitis C virus was (54.55 ± 12.97) , for the comparison group - (65.00 ± 10.00) ($p = 0.158$). According to the pain intensity scale, which demonstrates its impact on the routine activity of the patient, in the groups of patients and almost healthy individuals, the total score did not differ (respectively 58.73 ± 9.26 ; 55.20 ± 7.39) ($p = 0.463$).

According to the general health assessment, which includes current condition analysis of patient and treatment prospects, for patients, the calculated indicator was (57.18 ± 2.37) , for the reference group - (63.60 ± 4.37) ($p = 0.090$). The average score of vital activity for patients was (49.09 ± 7.62) , for almost healthy individuals - (56.00 ± 3.79) ($p = 0.105$). According to the scale of social functioning for the infected the total score was (75.00 ± 6.31) , for the comparison group - (86.25 ± 4.73) ($p = 0.100$). The indicator of role functioning due to emotional state for the studied group (63.64 ± 11.82) was 1.3 times lower compared to the control (83.33 ± 7.45 ; $p = 0.010$). According to the mental health scale, the score for patients (65.45 ± 5.56) was 1.2 times lower than for healthy individuals (75.60 ± 2.70 ; $p = 0.048$).

Summarizing the results according to the physical health component for the group of patients received a total score (43.81 ± 2.78) , for the reference group - (43.85 ± 2.12) ($p = 0.118$), the psychological component of health the indicator for the studied group (45.28 ± 3.77) was 1.2 times lower than for healthy individuals (51.92 ± 1.35 ; $p = 0.000$) (Fig. 1).

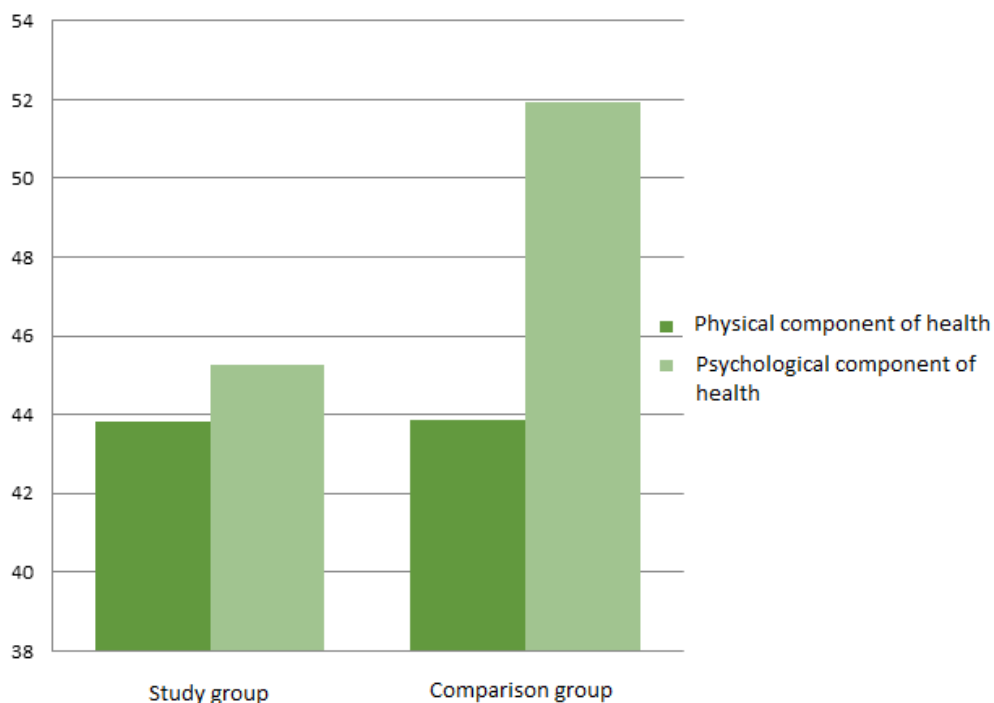


Figure 1 - The SF-36 questionnaire results for assessing life quality of patients with chronic viral hepatitis C in 2019-2020

Analysis of the data obtained by the method of searching for numbers showed that the average execution time for patients with HCV was (54.36 ± 4.49), which was 1.12 times more than for the comparison group - (48.5 ± 4.44) ($p = 0.218$).

According to the method of «Simple analogies», the average result for the study group was (7.91 ± 0.56), which is 1.1 times less compared to the reference group (8.7 ± 0.40 ; $p = 0.320$).

After processing the data obtained using a short scale for assessing the mental status of Mini-Cog, it was found that there were no violations of direct reproduction in all subjects, while the results of delayed reproduction differed: in the study group mentioned 3 words - 36.36%, 2 words - 27.27%, 1 word - 9.09%, 0 words - 27.27%; in the group of practically healthy people 3 words were reproduced - 20%, 2 words - 40%, 1 word - 30%, 0 words - 10%. The clock drawing test was performed without errors by 63.63% of patients with HCV and 100% of the comparison group. Summarizing the indicators on the three elements of the short-scale for assessing the mental status of Mini-Cog, it was found that 36.36% of patients with HCV are likely to have dementia, which is 3.64 times more than in the group of healthy people - 10% ($p = 0.042$) (Fig. 2).

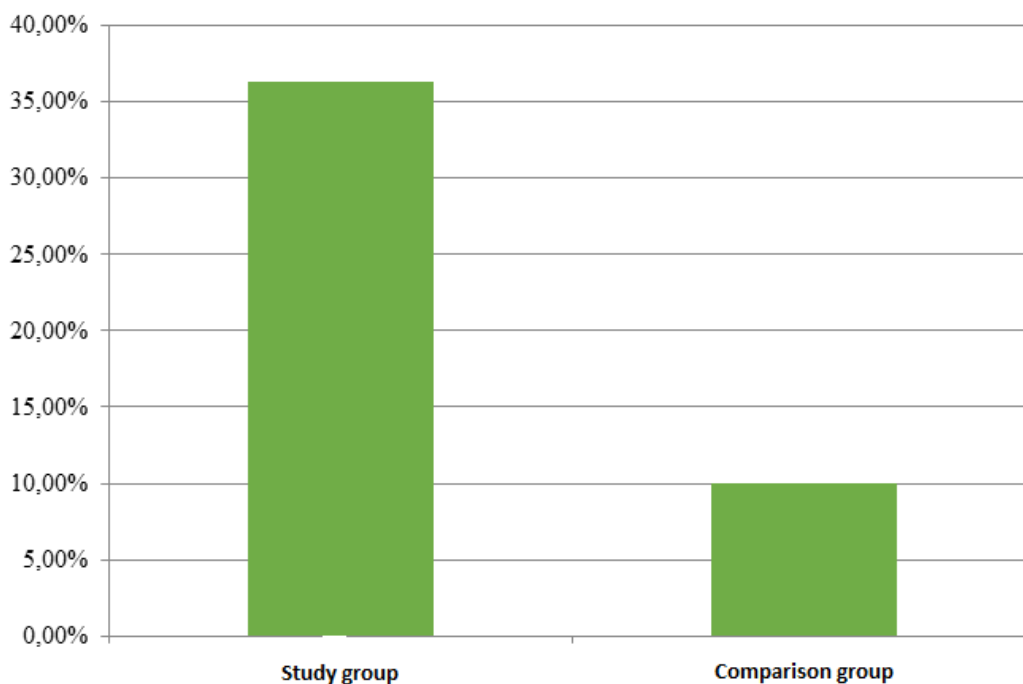


Figure 2 - Dementia probability for patients with HCV and healthy individuals

Data analysis from the «Bekhterev Institute Personal Questionnaire» showed that patients with HCV are characterized by: harmonious (36.36%), sensitive (27.27%), anxious (27.27%) and anosognostic (9.09%) types of internal pictures of the disease.

To increase the efficiency of communication between doctor and patient and improve the quality of diagnosis and treatment, an «Algorithm for providing medical care to patients with HCV according to their cognitive characteristics»(Fig. 3). was developed and implemented.

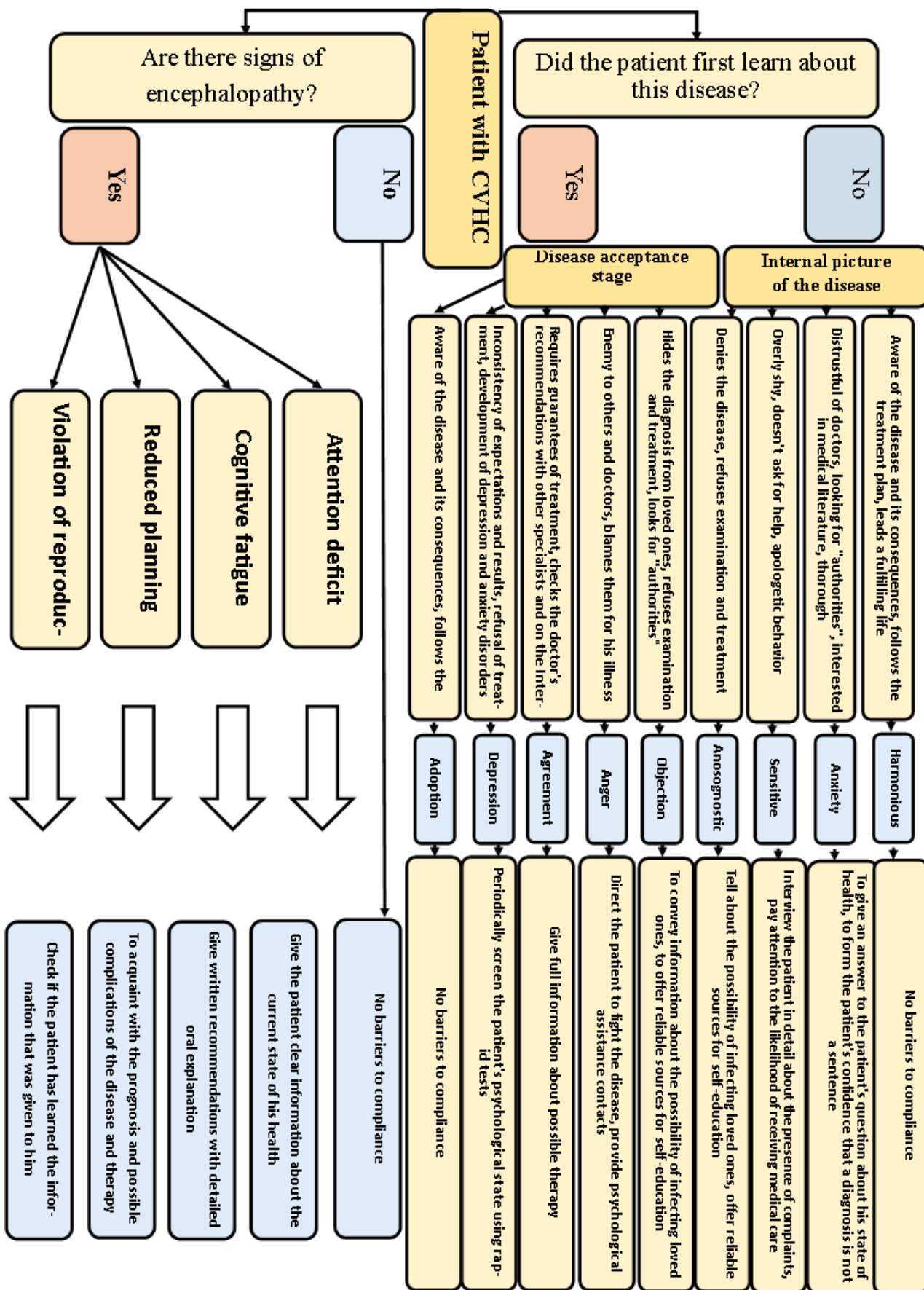


Figure 3 - Algorithm for providing medical care to patients with HCV according to their cognitive characteristics

Conclusions. An «Algorithm for providing medical care to patients with HCV» was developed to improve the quality of communication between doctors and patients with HCV.

The impact of HCV on patients' quality of life is a topical issue for world medicine. Impaired attention, ability to plan, decreased mental flexibility, abstract reasoning skills, judgment and cognition, abnormal sleep patterns, cognitive fatigue are the most common signs of HE. People with HCV have a higher risk of developing depression, anxiety, compulsiveness, insecurity, aggression, hostility, phobic anxiety, and psychosis.

Worse indicators of the psychological health component were found in patients with HCV than in practically healthy individuals ($p < 0.05$), which is justified by the social stigma of patients with HCV

Attention deficit, fatigue, decreased abstract thinking, and delayed reproduction of information have been reported in patients with HCV. They were most characterized by anxiety, anosognostic (rejection of thoughts about the disease, attributing symptoms to accidental circumstances, refusal of examination and treatment), sensitive types of the internal picture of the disease (fear of becoming a burden, apologetic behaviour, excessive shyness).

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DUŠEVNÉ OCHORENIE "SCHIZOFRÉNIA" A JEJ DOPAD NA KVALITU ŽIVOTA NOSITEĽA OCHORENIA

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Abstrakt: V príspevku budeme venovať pozornosť schizofrénnemu ochoreniu, ako aj dopadu na kvalitu života ľudí trpiacich schizofréniou. Naším cieľom bude charakterizovať schizofréniu, ako duševné ochorenie a následne priblížiť dopad ochorenia na život nositeľov tohto ochorenia. Zmapujeme sociálne aspekty životnej situácie nositeľov schizofrénného ochorenia. Schizofréniu sme si zvolili predovšetkým preto, že medzi jej hlavné spúšťače patrí stres, ktorý je dnes už žiaľ neoddeliteľnou súčasťou našich životov.

Kľúčové slová: schizofrénia, sociálne aspekty života, sociálna práca, kvalita života, dopad na život

Úvod: Schizofrénia je ochorenia, ktoré je v spoločnosti málo skloňované. Príčiny môžu byť rôzne. Niektorí nevedia, ako sa ochorenie prejavuje, čo od ľudí so schizofréniou očakávať a teda ich len ťažko charakterizujú. V prípade, že stretnú človeka s prejavmi duševného ochorenia, utvoria si názor, že je ten človek "divný". Rovnako existujú ľudia, ktorí sa tvária, že sa ich to netýka. V lepších prípadoch sú ľudia, ktorí vedia, že schizofrénia existuje. Chápu, čo obnáša duševné ochorenia a v prípade potreby dokážu poskytnúť aj pomocnú ruku. Vo väčšine prípadov sú v tejto roli sociálni pracovníci, či iní odborníci, avšak je dôležité uznať, že aj ľudia nezainteresovaní do sveta pomáhajúcich profesií vedia, ako sa správať voči ľuďom trpiacich schizofréniou alebo iným duševným ochorením.

Ľudia, ktorých postihlo akékoľvek duševné ochorenie majú ťažší život, než si väčšina z nás dokáže predstaviť. Sprevádzajú ich problémy, ako je znížená samostatnosť, problém s nadväzovaním vzťahov, či nemožnosť zamestnať sa. Existujú zariadenia poskytujúce pomoc a podporu ľuďom so schizofréniou, avšak na Slovensku je takýchto zariadení málo v porovnaní s počtom ľudí so schizofrénnym ochorením. Pri schizofrénií je okrem návštev zariadení sociálnych služieb samozrejmosťou aj návšteva psychiatra.

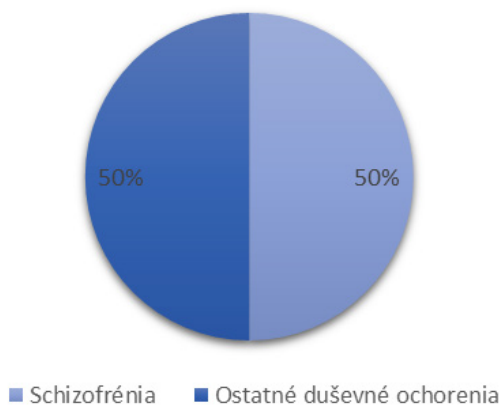
Jadro: Existuje niekoľko druhov duševných ochorení, pričom každé jedno z nich je niečím špecifické. Každé má iné príznaky, príčiny vzniku, korene, nositeľov rôznych vekových kategórií, či iné definície. To sú dôvody, prečo sú duševné ochorenia jednotlivito definované v Medzinárodnej klasifikácii chorôb – 10 známej ako MKCH-10. Ich rozdelenie je nasledovné:

- F00-F09 Organická duševná porucha zahŕňajúca symptomatické poruchy.
- Zaradíme sem aj poruchy, ktoré vznikli v dôsledku morfológických zmien v mozgu.
- rovnako sem patria aj poruchy zapríčinené fyzickými, či systémovými ochoreniami.

- Medzi tieto ochorenia patrí napríklad demencia, náladovosť, psychózy, ale aj stav delíria.
- F10-F19 Duševná porucha a porucha správania zapríčinená psychoaktívnymi látkami.
- F20-F29 Schizofrénia
- Patria sem aj schizotypálne poruchy, rovnako aj poruchy spôsobujúce rôzne halucinácie, či bludy.
- Vznik schizofrénie je zakorenený v genetike, biologických faktoroch, alebo je spôsobený ako dôsledok vplyvu prostredia.
- F30-F39 Afektívne poruchy
- Pri afektívnych poruchách si môžeme predstaviť rôzne zloženie syndrémov a symptómov, ktoré sú sprevádzane ďalšími problémami.
- Medzi problémy spôsobujúce afektívne poruchy zaraďujeme aj mániodepresie, či trvalé poruchy nálad.
- F40-F49 Neurotické poruchy, stresové poruchy a somatofomné poruchy.
- Ich príčina je pripisovaná prežívaním stresu.
- F50-F59 Syndróm poruchy správania v spojitosti s fyziologickými poruchami alebo somatickými faktormi.
- Poruchy osobnosti u dospelých, ale aj poruchy správania.
- F70-F79 Mentálna retardácia.
- F80-F89 Poruchy psychického vývoja.
- F90-F98 Poruchy správania v detstve a dospievaní a poruchy emócií.
- F99 Neurčené duševné poruchy. (Probstová, Peč, 2014)

Je prirodzené, že si schizofréniu, či iné duševné ochorenie zmýlime s rôznymi formami závislosti, nakoľko je aj tento fenomén v našej spoločnosti čoraz viac pozorovateľný. Je však dôležité detailne vnímať človeka, u ktorého máme podozrenie či už na užívanie návykových látok alebo na akýkoľvek typ duševného ochorenia. V oboch prípadoch je potrebné mu podať pomocnú ruku. Samozrejme človek trpiaci duševným ochorením sa v tejto roli ocitol bez možnosti voľby a vo vysokej miere to ovplyvní kvalitu jeho života.

Schizofrénia patrí medzi najzávažnejšie duševné ochorenia, nakoľko ich priebeh je chronický a často vedie až k trvalej invalidite. Aj to je dôvodom, prečo ju zaraďujeme medzi najčastejšie príčiny invalidity vo svete všeobecne. Len na Slovensku trpí schizofréniou približne jedno percento z celej populácie. (Liga za duševné zdravie, 2012) Túto skutočnosť potvrdzuje aj graf, hovoriaci o výskyte schizofrénie v zariadeniach sociálnych služieb podľa Češkovej (2005)



Graf č. 1. *Psychiatrickí pacienti v zariadeniach sociálnych služieb*

Zdroj: Češková, 2005

Schizofrénia je charakterizovaná ako chronické ochorenie, sprevádzané defektom nadväzovania a udržania vzťahov, či spoločenských kontaktov. Medzi príčiny vzniku patrí porucha mozgovej činnosti. Príznaky sa začínajú prejavovať v jednom z najdôležitejších období života, kedy sa človek stáva dospelým. V tejto etape má človek snahu budovať svoj život, osamostatniť sa a zamerať pozornosť na budovanie vlastného živobytia. Žiaľ, pretrvávanie schizofrénie je celoživotné a naplnenie týchto cieľov sa stáva nemožné. Nositelia ochorenia prevažne veria svojej fantázií, pričom uprednostňujú samotu. (Liga za duševné zdravie, 2012)

Príznaky schizofrénie

Medzi prioritné príznaky schizofrénneho ochorenia zaraďuje Bleuer (In Pečeňák, 2014):

- poruchy myslenia,
- autistické prejavy
- ťažkosti pri komunikácií
- nezrozumiteľnosť
- nepredvídateľné reakcie na podnety
- Porucha afektivity
- Ambivalencia.

Schizofrénia sa prejavuje aj niekoľkými špecifickými príznakmi, ako sú napríklad psychotické symptómy, poruchy iniciatívy, či motivácie, poruchy poznávacích funkcií, ale aj rôzne depresívne a manické symptómy. (Bankovská, Španiel, 2013)

Aj Čerňanová (2011) uvádza viacero rôznych prejavov schizofrénneho ochorenia, ako sú napríklad poruchy vedomia, oslabená psychomotorika, porucha vnímania a emotivity, poruchy myslenia, či poruchy osobnosti. Taktiež sem patria poruchy pozornosti, oslabená pamäť, porucha pudov, vôle a konania.

Schizofréniiu je možné rozdeliť aj na základe psychopatológie človeka. Toto ochorenie je typické niekoľkými klinickými formami, ktoré majú následne vplyv na kvalitu života človeka trpiaceho schizofréniou. Uvádza ich Češková (2005) nasledovne:

- F. 20.0 Paranoidná schizofrénia
- bludy
- F. 20.1 Hebefrenná schizofrénia
- Prejavuje sa období puberty
- F. 20.2 Katatónna schizofrénia
- prejavy sú spájané s poruchou osobnosti
- F. 20.3 Nediferencovaná schizofrénia
- Jej podoba nie je jednoznačne vyznačená
- F. 20.4 Postpsychotická depresia
- F. 20.5 Reziduálna schizofrénia
- chronický stav, ktorý nastáva po prekonaní akútnej fázy
- F. 20.6 Simplexná schizofrénia
- ide o zmeny v správaní zapríčinené postupným uzatváraním osobnosti

Z uvedených informácií je zrejmé, že schizofrénia skutočne patrí medzi najzávažnejšie ochorenia duševného charakteru. Na základe príznakov je zrejmé, že ochorenie má negatívny dopad na kvalitu života človeka trpiaceho schizofréniou, no zasiahne aj život jeho rodiny, či okolia.

Dopad na kvalitu života

Pre nositeľa schizofrénneho ochorenia sa stáva problémom veľa vecí, ktoré boli doposiaľ samozrejmé a bezproblémové. Začína pociťovať osobnostné, či spoločenské prekážky. Prítomný je pocit menejcennosti spojený s pocitom ťažoby voči svojej rodine. Rovnako nastáva problém s uplatnením sa na trhu práce, rovnako ja nadväzovanie vzťahov. Človek je spoločenský tvor a potrebuje okolo seba ľudí, s ktorými sa cíti dobre, s ktorými rád trávi čas. Človek so schizofréniou často stráca takýchto ľudí okolo seba a ostanú v jeho okolí len ľudia, ktorí majú akúsi morálnu povinnosť sa o neho starať. Okrem toho má oslabenú pamäť, kognitívne zručnosti, vďaka čomu nedokáže vykonávať činnosti, ktoré sú pre zdravých ľudí absolútnou samozrejmosťou.

Ľudia trpiaci schizofréniou sa často dostanú do spoločensky utláčaného prostredia, ktoré im výrazne znemožňuje získať kontrolu nad životom. Vzbudzuje to v nich pocit, že je problém výhradne na ich strane. (Fokus, Ústí nad Labem, 2003)

Pocity, ktoré v nich vzbudzuje okolie vplývajú na ich zdravotný stav, pričom môžu spomaliť liečbu ochorenia. U človeka so schizofréniou sa vytratí motivácia a snaha vedúca ku zlepšeniu kvality ich života. Okrem toho je schizofrénia vo vysokej miere stigmatizovaná spoločnosťou, nakoľko aj v minulosti ľudí trpiacich týchto ochorením izolovali od spoločnosti. Stigmazitácia ochorenia, žiaľ, pretrváva do dnes, pretože spoločnosť je stále nedostatočne informovaná. (Bankovská, Španiel, 2013)

Väčšina ľudí so schizofréniou sa stretáva s ďalšou životnou prekážkou, a tou je problém s bývaním. Tento problém spôsobuje nedostatok financií v dôsledok nemožnosti uplatniť sa na trhu práce, či strata blízkych, ktorí by sa mohli o chorého člena rodiny starať. Okrem toho si človek trpiaci schizofréniou musí hrať liečbu, lieky a stravu, čo je finančne náročné. Samozrejme je veľa prípadov, kedy človek s týmto zdravotným znevýhodnením nie je v takom stave, aby mohol bývať sám a starať sa o seba. Vtedy však odporúčame zvoliť podporované bývanie, kde sú pod dohľadom sociálnych pracovníkov a iných odborníkov. Chránené bývanie, známe aj ako podporované bývanie spočíva v samostatných bytových jednotkách, kde klienti žijú. Takéto byty zväčšia patria do majetku neziskových organizácií, ale aj iných občianskych združení, poskytujúcich pomoc práve ľuďom s rôznymi duševnými ochoreniami. (Dragonová, 2006)

Záver: Ako sme mali možnosť vidieť, schizofrénia je závažné duševné ochorenie, prejavujúce sa v období dospelosti. Znemožňuje človeku viesť samostatný plnohodnotný život, pričom znižuje kvalitu života aj rodine znevýhodneného. Napriek týmto ťažkostiam existuje množstvo spôsobov, ako túto nepriaznivú životnú situáciu zvládať čo najlepšie. Nositeľ ochorenia, ale aj jeho rodina sa môžu obrátiť na pomoc odborníkov. Nielen psychiatrov, ale aj na sociálnych pracovníkov, či organizácie poskytujúce pomoc práve tejto cieľovej skupine. Sociálny pracovník predstavuje dôležitú osobu v živote zdravotne znevýhodneného človeka, pretože ho dokáže sprevádzať na dlhej a zložitej ceste, počas ktorej ho učí samostatnosti. Veríme, že zariadení poskytujúcich pomoc a podporu bude čoraz viac.

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METHODS OF TREATMENT OF LOCALIZED PERIODONTITIS

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Annotation. Based on the literature and the results of our own research and an objective way to predict the course of localized inflammatory periodontal disease, an algorithm for treatment and prevention tactics in patients with these diseases.

Evaluation of the effectiveness of the developed method of treatment and prevention of localized periodontal lesions was performed based on the results of clinical, physicochemical and functional research methods in comparison with a group of patients who underwent treatment and prevention measures in the traditional way.

The commonality of the positive dynamics of digital indicators of the condition of periodontal tissues after treatment is traced, that is, a positive effect is achieved in the management of all patients. However, the best results were obtained using our method.

1. According to the dynamics of the values of the bleeding index, the treatment regimens used for the main group allow to achieve more effective control over the inflammatory process in periodontal disease.

2. Numerical indicators of the level of hygiene showed positive changes in the use of both treatment regimens, but a more pronounced and statistically significant effect was achieved due to our proposed method of treatment.

3. Established significantly greater effectiveness of our proposed treatment regimens in the main group compared to traditional treatment regimens in the control group for a special marker of periodontal tissue, which is CAL, especially with severe changes that occurred in diagnostic groups II, III.

4. The dynamics of reducing of the depth of periodontal pockets in group III was severe, which was digitally confirmed, and the certainty of differences after treatment has been shown to be more effective in the application of our proposed treatment complex.

5. According to digital indicators, a more severe and statistically better result in the elimination of the phenomena of recession of the gums was recorded after applying of our proposed method of treatment.

6. In groups I and II, the deviations of the pH of the gingival fluid before treatment were insignificant, and therefore, the comparison of digital data is uninformative. In group III, where the initial inflammatory condition was manifested, a significantly better result was achieved using the treatment method we developed.

7. X-ray data showed the stability of digital values in the observation groups before and after treatment, which was interpreted as sufficient control of destructive processes.

Mathematical analysis of the presented data demonstrates the advantages of the developed method of treatment of periodontal diseases, especially in non-surgical

treatment regimens, greater effectiveness in initial lesions, and thus - the prophylactic orientation of the measures of integrated control of periodontal tissues.

Key words: localized periodontitis, ozonated distilled water with titanium dioxide.

Objective: To enhance the therapeutic effect and reduce the duration of treatment by using a solution of titanium dioxide in ozonated distilled water for antiseptic treatment of periodontal tissues.

Materials and methods: The results of treatment of local inflammatory changes of periodontal tissues in 128 patients (73 women, 55 men) aged 21-65 years, which according to the severity of periodontal disease were divided into three groups: with gingivitis, with primary and moderate periodontitis. Schemes of therapeutic actions differed in pharmacotherapeutic support. To compare the effectiveness, we compared the results of conventional and developed treatment complexes.

Results and discussion: The commonality of the positive dynamics of digital indicators of the condition of periodontal tissues after treatment, ie a positive effect was achieved in the management of all patients. However, significantly better results were obtained using the method developed by us: according to the dynamics of bleeding index values, the proposed treatment regimens allow to achieve more effective control over the inflammatory process, digital indicators of hygiene showed that more significant effect was reached after our proposed method, clearer and statistically better result showed the dynamics of reducing the depth of periodontal pockets. Changes in the pH of the gingival fluid in a severe inflammatory condition showed a significantly better result after using our treatment methods. X-ray data showed the stability of digital values in the observation groups before and after treatment, which was interpreted as a sufficient control of destructive processes.

Conclusion: Mathematical analysis of the presented data demonstrates the advantages of the developed method of treatment of periodontal diseases, especially in non-surgical treatment regimens, greater effectiveness in initial lesions, and thus - the prophylactic orientation of the measures of complex control of periodontal tissues.

Introduction

For today, the achievements of science and practice in the field of periodontology are undeniable. However, to the issue of localized inflammatory conditions of tooth-retaining structures is given insufficient attention in the provision of dental care. Such inflammatory conditions are typical of young people and are caused by the adverse effects of local irritants [1,2].

A number of local factors that affect the condition of the periodontium include dental plaque, microflora, untreated oral cavity, defective fillings on the contact surfaces and cervical region of the teeth, lack of contact point, poor quality of orthopedic and orthodontic structures, improper attachment of the bridles of the lips, tongue, bad habits [3,4].

In the professional literature, the presentation of methods for the treatment of localized periodontitis is reduced to the recommendation of comprehensive treatment measures for generalized periodontitis. Without taking into account the peculiarities of the limited process, such a scheme does not meet the needs of extensive dental practice. In our opinion, due to the common etiopathological factors and the similarity of clinical

manifestations, much more acceptable for the treatment of localized periodontitis is the method of treatment of periimplantitis.

In the treatment of inflammatory soft tissue diseases, various drugs of general and local action are used (antibiotics, antiseptics, analgesics, etc.), which can cause addiction to the microflora and the development of resistance to antibacterial drugs, allergic and other side effects, changes in immune reactivity and nonspecific protective factors [5].

In this regard, of particular interest are methods that, along with local, have a multifaceted effect on the patient's body, and thus have minimal side effects. Such methods include ozone therapy [6].

Ozone therapy has immunomodulatory, anti-inflammatory, bactericidal, virolytic, fungicidal, cytostatic, anti-stress and analgesic effects. According to our research, the bactericidal potential of ozonated distilled water is comparable to that of 0.2% chlorhexidine solution [7].

For today, the attention of clinicians for treatment of localized periodontitis has been attracted by a group of medical sorbents that provide an active cleansing effect on a purulent wound [8,9,10]. Submicron size titanium dioxide (TiO₂) meets all these requirements. Its main advantage is a large surface area and high exchange capacity [11].

Ozonated distilled water with titanium dioxide provides sorption of microorganisms and their toxins, tissue breakdown products, toxic metabolites, their localization in the wound and subsequent elimination from the site of inflammation [7].

Therefore, the aim of our study is to enhance the therapeutic effect and reduce the duration of treatment by using a solution of titanium dioxide in ozonated distilled water for antiseptic treatment of periodontal tissues.

Materials and methods of research

128 patients (73 women, 55 men) aged 21-65 applied to the clinic for treatment of inflammatory changes in periodontal tissues. All patients were examined with their written informed voluntary consent through a comprehensive clinical, functional, and laboratory study. According to the determinants of clinical periodontal health, the general periodontal status was stated.

At the dental examination, a clinically normal condition of the periodontium and gums was observed, as well as signs of inflammation were determined according to the area of pain complaints and the presence of local irritants: irrationally restored anatomical shape of teeth by composite restorations (47 cases), orthopedic structures (46 cases), anatomical disorders due to untreated treatment (35 cases). The survey used a simplified map to assess dental status (WHO, 1986).

Intraoral dental examination began with an examination of the oropharynx, mucosa, dentition, occlusion and organs of the oral cavity, special attention was paid to the appearance, color, consistency-turgor of the gums.

Instrumental clinical examination included probing, percussion, and determining the degree of tooth mobility (TM). Examining patients with chronic localized periodontitis, special attention was paid to the exposure of the roots (recession) of the teeth, the depth of the periodontal pocket. The presence and nature of exudate in periodontal pockets were taken into account.

Determination of the depth of the periodontal pocket, according to the WHO recommendation, was performed using a plastic graduated probe with colored divisions (green-3mm, white-6mm, red-9mm) along the vertical axis from the buccal, lingual and proximal surfaces, the marginal distance gums to the bottom of the periodontal pocket

was measured and its average value was set. The magnitude of the recession or apical displacement of the gums was determined by measuring the distance from the enamel-cement border to the marginal edge of the gums.

A bleeding index of the gums was also established while probing because this indicator is strongly correlated with the severity of the inflammatory process and the hygienic index (Steflik D.E. et co-work, 1986). The degree of bleeding from the gingival sulcus was determined by the method of Mühlermann - Son, 1971, Rateitschak K.H. et co-work, 1989 in points: no bleeding - 0, the presence of punctate bleeding in the interdental space - 1, linear - 2, moderate, occupying the entire perimeter of the gingival sulcus - 3, profuse, occupying the gingival sulcus and dental papilla - 4.

Tooth mobility was determined in points according to the Lindhe scale (1993), according to which 0 points - no tooth mobility, 1 point - the tooth crown is displaced horizontally by 0.2-1 mm, 2 points - the tooth crown is displaced horizontally by more than 1 mm, 3 points - joining of the vertical mobility of the tooth.

The hygienic condition of soft tissues and teeth was objectified using the gingival index (GI, Loë J. - Silness I, 1963). The severity of non-mineralized and mineralized deposits on these structures was evaluated from 0 to 3 points. Absence of deposits corresponded to 0 points, 1 point - insignificant deposits within the isolated area of a separate tooth surface, 2 points - solid deposits occupying 1-2 tooth surfaces, and 3 points - deposits localized on 3-4 surfaces of the examined tooth.

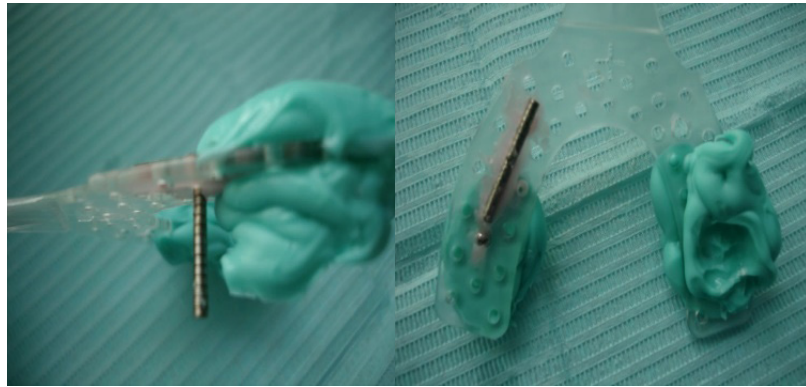
Clinical inspection of the condition of the marginal periodontium to determine the depth of periodontal pockets, the presence of bleeding was performed in combination with the analysis of pHmetry of gingival fluid [11,19]. They were supplemented by standardized X-ray examinations, which established quantitative and qualitative features of the condition of periodontal bone tissue.

For X-ray examination of patients, we consistently used two main methods - orthopantomography and intraoral targeted radiography. At the same time, we fully agree with the generally accepted position that the degree of risk of exposure in intraoral radiography is much lower than in panoramic [12]. Therefore, to detail periodontal bone changes, if it was possible to evaluate them with a series of intraoral images not more than 5, they were preferred in the final X-ray examination of the bone environment.

When the radiological picture was assessed, the height and shape of the vertices of the interalveolar septa, the severity of the cortical plate, the nature of the pattern of the spongy substance of the alveolar bone and the condition of the periodontal fissure were taken into account.

If the radiograph did not show changes in the area of the interalveolar septa, then, along with other signs, "gingivitis" was diagnosed. If the radiograph revealed the phenomenon of osteoporosis in the area of the vertices of the interalveolar septa with a violation of the integrity of the compact plate, "periodontitis" was diagnosed.

In X-ray examinations of patients, we used an X-ray pattern [13]. This device consists of horizontal and vertical rods, which are T-shaped connected to each other by a screw connection. Wedge-shaped notches are applied to the outer surface of the vertical and horizontal bars every millimeter, thanks to which it is possible to determine the level of lost bone tissue in the two-dimensional coordinate system. The specified pattern was fixed on a polyethylene coating of plates for panoramic radiography or directly on the sensor of the radiovisiograph (drawing 1).



Drawing 1 - *View of the X-ray pattern attached to the bite fork for three-dimensional X-ray examination (a-side view, b-top view)*

Additional instrumental studies of the condition of periodontal tissues were performed by pH-metry of the contents of the gingival sulcus. Determination of the concentration of hydrogen ions of the gingival sulcus was performed using the method of direct pH-metry with universal litmus strips indicator pH 0-12 (LaCheMa, Czech Republic). Sulcular pH-metry was performed on all patients during the dental examination and served to clarify the condition of periodontal tissues, as well as to verify the effectiveness of treatment. The norm, according to the literature, was taken as the pH value of the gingival fluid, which was determined in the optimum of 6.8 - 7.1 units. [14]. At the initial development of inflammatory processes, the parameters of pH-metry decreased to 6.7 - 6.5 units, and in severe inflammatory processes decreased to 6.0 units. and below [15].

According to the degree of severity of periodontal diseases, which was assessed by clinical data and indicators of bone destruction detected by radiography, all patients were divided into the following groups.

First group consisted of 43 people diagnosed with gingivitis. Patients of this group suffered from hyperemia, hypostasis of interdental papillae with involvement or without involvement of the part of a mucous membrane of an alveolar shoot; local bleeding was detected (1-2 points). Hygienic index ranged from 1 ± 1 point without loss of epithelial attachment. The pH value of the gingival fluid was in the range of 6,798-6,863. Intraoral radiographs didn't show signs of periodontal bone destruction.

The second group of clinical observation consisted of 47 people diagnosed with primary periodontitis (stage I according to the classification of EFP & AAP World Workshop, 2017) [16,17]. At patients of this group hyperemia, hypostasis of a mucous membrane of an alveolar shoot with distribution or without to the transition convolution in the area of the dental-maxillary sextant, that is, zonal changes did not exceed 30%, which determined the locality of the process. At the same time both linear, and point moderate bleeding (1-2 points) was observed during probing areas with inflammatory symptoms. The hygienic index varied within 2 ± 1 points with the loss of gingival attachment around one of the tooth surfaces and the depth of the periodontal pocket 2 ± 0.5 mm. The pH of the gingival fluid was in the range of 6,643-6,768. At the same time, in the parts of clinically healthy gums probing did not exceed 2 mm, did not cause bleeding, and the pH was normal. On targeted radiographs, we observed in patients vertical bone destruction of the interdental septa within 1 mm.

Group III consisted of 38 patients diagnosed with moderate periodontitis (stage II), in whom we observed zonal changes in the gums with loss of their normal structure. The pH of the gingival fluid was in the range of 6,502-6,687. These changes were combined with linear and moderate bleeding during probing (2-3 points). Hygienic condition was characterized by significant deposits (3 points) with a pocket depth of 3 ± 1 mm.

On targeted radiographs in all patients in this group observed a vertical-horizontal form of bone resorption within 1/3 of the length of the tooth root.

Cases with the risk of additional tooth loss (stages III and IV) were not included in the observation because the diagnosis of localized periodontitis lost relevance in the generalization of the inflammatory process.

Therapeutic treatment regimens were used depending on the diagnosis established in relation to the values of the studied clinical, radiological and instrumental methods of examination. Diagnostic groups of clinical observation of the applied treatment regimens were divided into main and control subgroups. Specific schemes differed in pharmacotherapeutic support. To compare the effectiveness, we compared the results of conventional and developed treatment complexes.

SCHEME A for the control group. The patient was decontaminated using a Vector device and a suspension solution of Vector abrasive fluid.

SCHEME A1 for the main group. The patient was decontaminated using a Vector apparatus and a dispersed solution of titanium dioxide of submicron size in ozonated distilled water.

SCHEME B for the control group. The patient underwent antiseptic treatment of soft tissues by irrigating 0.1% or 0.2% solution of chlorhexidine bigluconate 10-20 ml every other day for 21-30 days. In addition, the patient was instructed on effective personal hygiene.

SCHEME B1 for the main group. The patient soft tissues were irrigated with a dispersed solution of titanium dioxide in ozonated distilled water 10-20 ml every other day for 21-30 days. In addition, along with individual hygiene, the patient was recommended regular daily rinsing of the mouth with ozonated distilled water.

Ozonation of water was achieved using an ozonizer GL - 3188, according to the manufacturer's instructions to an ozone concentration of 12 mg / l. Titanium dioxide (rutile) powder of submicron size (d.4,230 nm), purity 99.9 +% was calculated in ozonated distilled water to obtain a concentration of 0.05%. It was synthesized by the method of deposition in the laboratory of the Department of Pharmacological, Organic and Bioorganic Chemistry (Head of the Department - Academician B.S. Zimenkovsky). This concentration did not cause local irritation and had high antiseptic and sorption properties [7].

SCHEME B. Local and general antibiotic therapy was used. Topical antibiotic therapy consisted of lubricating the gums and introducing 1% tetracycline hydrophilic cream into the periodontal pockets for 14 days.

General antibiotic therapy was performed after local antibiotic therapy for 7-10 days. Patients were recommended to take tetracycline 500 mg twice daily or spiramycin 500 mg three times daily without or in combination with ornidazole 500 mg twice daily.

SCHEME D. Included the technique of closed or open curettage without and with the help of gingivotomy, removal of granulation tissue, resection of pathologically altered parts of bone pockets and restoration of lost bone volume with xenoautoosteoplastic biomaterial followed by gingivoplasty.

The treatment process was considered complete and its results were evaluated according to a set of indicators: 1) subjective testimony of patients: no pain, bleeding, feeling of comfort; 2) objective clinical examination presented a picture without signs of inflammation - pink, clear gum texture, no bleeding, deposits on the tooth surface, instrumentally determined the density of the mucosa to the tooth surface, the depth of the gingival joint did not exceed 2 mm.

To evaluate the accuracy, correctness, precision, and reproducibility of representative clinical, radiological, microbiological, and instrumental studies, we used Student's parametric criterion and nonparametric sign criteria (SC) and Wilcoxon test (U test). The automated program allowed to count the number of inversions of pairwise comparisons and to determine according to Wilcoxon tables their reliability from $p = 0.05$ to $p = 0.01$.

Research results and their discussion

To objectify the clinical picture on the basis of an important and universal symptom of gingivitis, first of all paid attention to the dynamics of the values of the bleeding index, the numerical indicators of which are presented in **table 1**.

Data before and after treatment differ significantly in all comparable observations of the main group, but in the control group accuracy is not observed in group I of the examined patients.

In this manner, according to the dynamics of the bleeding rate, the treatment regimens used for the main group allow to more effectively achieve control over the local inflammatory process of periodontal tissues.

Table 1.
Dynamics of the bleeding index during treatment

Groups of examined patients	Bleeding index				Significance of differences in digital values after treatment in observation groups
	Main group (n = 65) SCHEME A1, B1		Control group (n = 63) SCHEME A, B		
	До л-ня	Після л-ня	До л-ня	Після л-ня	
I (n=43)	0,333± 0,067	0,012± 0,009	0,341± 0,054	0,121± 0,089	P* > 0,05
	P < 0,001		P < 0,05		
II (n=47)	1,375± 0,625	0,037± 0,011	1,403± 0,561	0,042± 0,023	P* < 0,05
	P < 0,001		P < 0,001		
III (n=38)	1,625± 0,375	0,039± 0,143	1,579± 0,438	0,057± 0,087	P* < 0,001
	P < 0,001		P < 0,001		

Note: P - accuracy of comparison of indicators before and after treatment in observation groups; P* - an indicator of the reliability of the results of treatment of the main group compared with the control.

The state of hygiene in dental diseases is an important indicator of the success of treatment, as well as a prognostic indicator of stabilization. Therefore, the hygiene index

was considered an objective paraclinical verifier of treatment success and comparison of the effectiveness of treatment methods.

Numerical values of the hygienic index (according to the method of Loë J. – Silness I, 1963) are presented in **table 2**.

Table 2.
Indicators of the hygienic index during treatment

Groups of examined patients	Hygienic index				Significance of differences in digital values after treatment in observation groups
	Main group (n = 65) SCHEME A1, B1		Main group (n = 65) SCHEME A1, B1		
	Before treatment	After treatment	Before treatment	After treatment	P*
I (n=43)	1,53±0,13	1,02±0,2	1,55±0,10	1,2±0,09	P*>0,05
	P<0,05		P<0,05		
II (n=47)	1,95±0,04	1,06±0,1	1,94±0,03	1,4±0,1	P*<0,05
	P<0,001		P<0,001		
III (n=38)	2,58±0,12	1,1±0,09	2,60±0,09	1,5±0,2	P*<0,05
	P<0,001		P<0,001		

Note: P - accuracy of comparison of indicators before and after treatment in observation groups; P* - an indicator of the reliability of the results of treatment of the main group compared with the control.

Numerical indicators show a change in the level of hygiene in a positive direction when using both treatment regimens, but a more valuable and statistically significant effect is achieved thanks to our proposed method of treatment.

Indicators of periodontal pocket (PP) depth in the groups of initial periodontal tissue lesions improved, although no figures were found in the digital values (**Table 3**).

Table 3.
Indicators of periodontal pocket depth during treatment

Groups of examined patients	Depth of periodontal pocket				Significance of differences in digital values after treatment in observation groups
	Main group (n = 65) SCHEME A1, B1		Control group (n = 63) SCHEME A, B		
	Before treatment	After treatment	Before treatment	After treatment	P*
I (n=43)	3,33±0,13	3,07±0,07	3,29±0,08	3,05±0,03	P*>0,05
	P<0,05		P<0,05		
II (n=47)	4,15±0,08	3,07±0,06	4,21±0,06	3,16±0,01	P*<0,05
	P<0,001		P<0,001		

III (n=38)	4,90±0,13	3,13±0,08	4,93±0,09	3,48±0,05	P* < 0,001
	P < 0,001		P < 0,001		

Note: P - accuracy of comparison of indicators before and after treatment in observation groups; P* - an indicator of the reliability of the results of treatment of the main group compared with the control.

The dynamics of reduction of depth of probing of a periodontal pocket in groups II, III was severe, that found digital confirmation, and reliability of differences after treatment proved to represent greater efficiency of application of the complex of treatment offered by us.

Loss of epithelial attachment (LEA) was clinically observed in the observation groups after the treatment course. In digital form, the data are presented in **table 4**.

LEA in group I before treatment was not pronounced and fully recovered after treatment; hence the digital data is not accurate, it is clear from the original diagnostic status. At the severe periodontal changes which took place in diagnostic groups II, III it was possible to comprehend demonstrative restoration of the epithelial attachment which accurately reflected digital values.

Thus, a significantly higher efficiency of our proposed treatment regimens in the main group compared to traditional treatment regimens in the control group for determining the condition of periodontal tissues, which is LEA.

The dynamics of reducing the depth of probing the periodontal pocket in groups II, III was severe, which has found digital confirmation, and the significance of the differences after treatment has been shown to be more effective in the application of treatment complex proposed by us.

Clinical attachment loss (CAL) was clinically noticed in the observation groups after the treatment course. The data are presented in table 4 in digital form.

CAL in group I before treatment was not severe and fully recovered after treatment; herefrom the digital data is not accurate, it is clear from the original diagnostic status. At the severe periodontal changes which took place in diagnostic groups II, III it was possible to comprehend demonstrative restoration of epithelial attachment, that accurately reflected the digital values.

Thus, a significantly higher efficiency of our proposed treatment regimens in the main group was fixed, compared to traditional treatment regimens in the control group, according to the determining indicator of the condition of periodontal tissues, which is CAL.

Table 4.

Indicators of the state of epithelial attachment in dynamic observation.

Groups of examined patients	Clinical attachment loss				Significance of differences in digital values after treatment in observation groups
	Main group (n = 65) SCHEME A1, B1		Control group (n = 63) SCHEME A, B		
	Before treatment	After treatment	Before treatment	After treatment	
I (n=43)	0,2±0,15	0,2±0,08	0,3±0,05	0,2±0,1	P* > 0,05
	P > 0,05		P > 0,05		
II (n=47)	1,5±0,5	0,5±0,25	1,3±0,7	0,6±0,15	P* < 0,05
	P < 0,001		P < 0,001		

III (n=38)	2,5±0,5	0,65±0,15	2,6±0,4	0,7±0,14	P* < 0,05
	P < 0,001		P < 0,001		

Note: P - accuracy of comparison of indicators before and after treatment in observation groups; P* - an indicator of the reliability of the results of treatment of the main group compared with the control.

Numerical data on the dynamics of recession of the gums during treatment are presented in **table 5**.

Table 5.
Indicators of gum recession during treatment

Groups of examined patients	Gum recession				Significance of differences in digital values after treatment in observation groups
	Main group (n = 65) SCHEME A1, B1		Control group (n = 63) SCHEME A, B		
	Before treatment	After treatment	Before treatment	After treatment	P*
I (n=43)	0,278±0,066	0,078±0,047	0,269±0,078	0,101±0,067	P* < 0,05
	P < 0,001		P < 0,001		
II (n=47)	0,514±0,063	0,094±0,044	0,526±0,058	0,208±0,034	P* < 0,05
	P < 0,001		P < 0,001		
III (n=38)	0,726±0,075	0,106±0,057	0,742±0,066	0,221±0,046	P* < 0,05
	P < 0,001		P < 0,001		

Note: P - accuracy of comparison of indicators before and after treatment in observation groups; P* - an indicator of the reliability of the results of treatment of the main group compared with the control.

Numerical indicators show a change in the level of recession of the gums in a positive direction with the use of both treatment regimens, but a more pronounced and statistically significant effect was achieved thanks to our proposed method of treatment.

Changes in the pH of gingival fluid, which is a predictor of destructive processes in periodontal pathology, were observed. Numerical data are presented in **table 6**.

Table 6.
Change of the pH of gingival fluid during the treatment

Groups of examined patients	pH of gingival fluid				Significance of differences in digital values after treatment in observation groups
	Main group (n = 65) SCHEME A1, B1		Control group (n = 63) SCHEME A, B		
	Before treatment	After treatment	Before treatment	After treatment	P*
I (n=43)	6,84±0,02	6,99±0,02	6,83± 0,03	6,99±0,09	P* > 0,05
	p < 0,05		p < 0,05		

II (n=47)	6,72±0,03	6,96±0,02	6,71± 0,06	6,91±0,02	P*>0,05
	p<0,001		p<0,001		
III (n=38)	6,61±0,05	6,94±,0,03	6,59± 0,09	6,88±0,02	P*<0,05
	p<0,001		p<0,001		

Note: P - accuracy of comparison of indicators before and after treatment in observation groups; P * - an indicator of the reliability of the results of treatment of the main group compared with the control.

Deviations in the pH level of gingival fluid in group I before treatment were insignificant, and therefore, the comparison of digital data is uninformative. In groups II, III, where the initial inflammatory state was severe, a significantly better result was achieved using the treatment method developed by us.

X-ray data (Table 7) showed the stability of digital values in the observation groups before and after treatment, which, as a reflection of the state of the bone component of periodontal tissues, was interpreted as sufficient control of destructive processes.

Table 7.
Dynamics of periodontal radiometric changes

Groups of examined patients	X-ray values				Significance of differences in digital values after treatment in observation groups
	Main group (n = 65) SCHEME A1, B1		Control group (n = 63) SCHEME A, B		
	Before treatment	After treatment	Before treatment	After treatment	
I (n=43)	-; +/ 0,15±0,1	-; +/ 0,05±0,05	-; +/ 0,14±0,1	-; +/ 0,05±0,05	P*>0,05
	P<0,05		P<0,05		
II (n=47)	+;/ +/ 0,64±0,06	-; +/ 0,24±0,08	+;/ +/ 0,58±0,04	-; +/ 0,27±0,05	P*>0,05
	p<0,001		p<0,001		
III (n=38)	+;/ +/ 1,0±0,5	-; +/ 0,47±0,08	+;/ +/ 1,1±0,4	-; +/ 0,55±0,07	P*<0,05
	p<0,001		p<0,001		

Note: P - accuracy of comparison of indicators before and after treatment in observation groups; P * - an indicator of the reliability of the results of treatment of the main group compared with the control.

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THE MAIN CYTOKINES OF INFLAMMATORY RESPONSE IN PERIODONTAL TISSUES, THERAPEUTICAL TARGETS: A REVIEW

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Abstract. Nowadays, inflammatory and inflammatory-dystrophic periodontal diseases are widespread in Ukraine and in many other countries. Today we have no

complete and correct idea of the etiology and pathogenesis of periodontitis, thus, the ethiotropic therapy of inflammatory periodontal lesions does not solve the problem completely. Periodontitis and self-destruction of periodontal tissues also can trigger entire cascades of inflammatory and adaptive reactions in periodontal tissues. These reactions are regulated by cytokines and chemokines up to 44 names which interact with numerous receptors on cells, activate and cause the migration of macrophages, neutrophils and lymphocytes, as well as support the transformation and proliferation of the lymphocytes. Cytokines as therapeutic targets for the treatment of different diseases have been considered for a long time – that includes autoimmune diseases, collagenoses, tumors and cardiovascular lesions, in our opinion we should pay attention to such opportunities for the treatment of inflammatory and inflammatory-dystrophic periodontal lesions. The role of pro-inflammatory cytokines and chemokines in development of acute and chronic periodontitis was described for TNF- α , IFN- γ , TGF- β , IL-1 (IL-1 α and 1 β , interleukin 1 antagonist, IL-18), IL-2, IL-5 (eosinophilic colony-stimulating factor), IL-6, IL-8, IL-12, IL-17, IL-21, IL-23, IL-33. Anti-inflammatory properties were described for IL-4, IL-10, IL-13, IL-22, IL-35.

For different therapeutic needs a row of immunobiological experimental medicines was created, some of them were approved for clinical usage in cases of autoimmune and allergic diseases. They are: “Anakinra”, “Mepolizumab”, “Reslizumab”, “Siltuximab”, “Tocilizumab”, “Sarilumab”, “Clazakizumab”, “Olokizumab”, “Sirukumab”, “Elsilimomab”, “Levilimab”, “HuMax-IL8”, “Ustekinumab”, “Secukinumab”, “Ixekizumab”, “Brodalumab”, “Guselkumab”, “Tildrakizumab”, “Riskankizumab”. Despite the lack of a complete picture of the pathogenesis of periodontal disease, some involved cytokines and their receptors in periodontal tissues are considered as markers of inflammation and regeneration processes, as well as therapeutic targets for the use of immunobiological blockers (monoclonal antibodies). Of course, such therapy is developed for systemic inflammatory and autoimmune diseases but the likelihood of their use in periodontology also looks promising.

Key words: periodontium, inflammation, pathogenesis, cytokines, regulation, treatment.

Introduction

Inflammatory and inflammatory-dystrophic periodontal diseases are widespread in Ukraine and in many other countries³⁵. Centuries of research on this problem have allowed us to accumulate a significant amount of information about the etiology, mechanisms of development and therapeutic approaches to their treatment, but the problem is complex and multicomponent. Today we have no complete and correct idea of the etiology and pathogenesis of periodontitis³⁶. Nowadays, the ethiotropic therapy of inflammatory periodontal lesions does not solve the problem completely³⁷. This fact indicates the presence of more complex mechanisms of disease development and a number of “gaps” in the scientific information on this subject³⁸. Therefore, the

³⁵ Mazur IP, 2017, p. 71.

³⁶ Klityns`ka OV et al., 2014, p. 217

³⁷ Popovich IY et al., 2017, p. 65

³⁸ Lang NP et al., 2018, p. 9

pathogenetic therapy of chronic inflammatory periodontal lesions remains one of the leading and effective areas of quality rehabilitation of periodontal patients³⁹.

It is established that factors of bacterial pathogenicity (such as hydrogen sulfite, proteases, toxins, ammonia, etc.) which can affect the course of periodontitis and cause self-destruction of periodontal tissues, also can trigger entire cascades of inflammatory and adaptive reactions in periodontal tissues. These reactions are regulated by a group of local factors - cytokines and chemokines - up to 44 names which interact with numerous receptors on cells, activate and cause the migration of macrophages, neutrophils and lymphocytes, as well as support the transformation and proliferation of the lymphocytes^{40 41}.

Cytokines as therapeutic targets for the treatment of some diseases have been considered for a long time - they include autoimmune diseases, collagenoses, tumors and cardiovascular lesions, in our opinion we should pay attention to such opportunities for the treatment of inflammatory and inflammatory-dystrophic periodontal lesions⁴².

The main cytokines in periodontal lesions development

Tumor necrosis factor- α (TNF- α). Another name is kachectin. This cytokine can exist in free form and in bound to membranes. It realizes its function by interacting with about 30 specialized receptors on cell surfaces. The predominant influence is in starting the processes of apoptosis but also in supporting the survival of individual cells, angiogenesis and differentiation of individual cells⁴³.

To date, its leading role is in the development and maintenance of inflammatory processes in various organs and tissues of the human body has been proven. This factor has a strong effect on bone remodeling (as shown in cases of rheumatoid arthritis), it regulates osteoclast precursor levels in the bone marrow by altering c-fms expression and activates osteoclasts by enhancing the signaling mechanism of NFAN- κ B receptor activators⁴⁴. TNF- α plays an important role in controlling the infectious process. Its releasing by macrophages is a crucial step in initiating the formation and maintenance of the existence of granulomas and plays an important role in protection against invasion, including intracellular parasites. TNF- α is also involved in the processes of leukocyte migration and filtration of immune complexes. The clear role of the factor in the tumor process is not known but its levels change at different stages of tumorigenesis. Its level increases with heart disease. It is believed that TNF- α contributes to the development of dyslipidemia and insulin resistance which are the leading mechanism for the development of atherosclerotic changes in blood vessels. TNF- α plays a leading role in the development of sepsis and peritonitis with its impact on the level of production of nitric oxide. Also, it plays a special role in the development of graft rejection reactions. Therefore, we can assume that tumor necrosis factor- α is a pleiotropic cytokine involved in numerous homeostatic and pathological mechanisms of the human organism⁴⁵.

TNF- α is preferably synthesized by macrophages; in small amounts it can be synthesized by T-lymphocytes, natural killers (NK), muscle cells, fibroblasts, vascular

³⁹ Danylevskyj NF et al., 2000, pp. 37, 111

⁴⁰ Yucel-Lindberg T et al., 2013, e7

⁴¹ Lundmark A et al., 2019, p.216

⁴² Surlin P et al., 2020, p.3

⁴³ Pan W et al., 2019, p.64

⁴⁴ Xiong G et al., 2019, p.6282635

⁴⁵ Kozak M et al., 2020, p.41

endothelium and osteoclasts. In the development of inflammatory lesions of the periodontium TNF- α plays a crucial role at the beginning of the inflammatory process when it is released from mastocytes and affected periodontal cells, triggers tissue destruction reactions, also it stimulates osteoclast proliferation leading to resorption of alveolar bone⁴⁶.

Interferons of group γ (IFN- γ) – belong to endogenous low molecular weight proteins with antiviral, immunomodulatory and antitumor properties. By their structure, they are glycoproteins that are produced mainly by T-lymphocytes. According to its function, this class of interferons is antitumor, immunomodulatory, radioprotective, cytostatic. The mechanism of action of IFN- γ is related to the effect on enzymes that control the synthesis and destruction of nucleic acids – synthetases and nucleases; they affect the synthesis of a special cellular protein that inhibits the translation and replication of viruses. The immunoregulatory effect of IFN- γ is manifested in increased phagocytic activity of macrophages, enhanced spontaneous activity of T-killers and cooperative immune response against virus-induced tumor cells. Immune interferon (γ -interferon, T-interferon), produced mainly by T-lymphocytes, is a cytokine. It is characterized by antiproliferative activity, as well as increases the activity of macrophages and cytotoxicity of NK cells⁴⁷. IFN- γ is synthesized by stimulated lymphocytes upon re-encounter with a homologous antigen under the influence of mitogens, which may act as viruses, some species of bacteria, actinomycetes, rickettsiae, chlamydia, mycoplasmas, protozoa, nucleic acids, polysaccharides and lipopolysaccharides⁴⁸.

The role of IFN- γ in the development of inflammatory periodontal lesions is not fully understood, a number of studies indicate completely opposite data. There was shown a direct relationship between the intensity of the inflammatory response in the periodontium and the level of IFN- γ in the gingival fluid, other studies indicate a possible relationship with the existing comorbid status in patients and indicate an increase in this type of interferon with periodontal healing. It is clearly established that the level of IFN- γ changes in cases of disorders of the periodontal tissues but its role and indicator properties in periodontal disease are unclear now⁴⁹.

Transforming growth factor- β (TGF- β) is a cytokine of systemic action which is involved in numerous physiological, pathological and adaptive reactions in the human body. It exists in three forms β 1, β 2 and β 3. The β 1 fraction belongs to the so-called superfamily of transforming growth factor (more than 40 proteins), including inigbins, activins, anti-Mullerian hormones, bone morphogenetic proteins, growth differentiation factors, glial neurotrophic factors and other regulatory proteins. TGF- β exerts its influence through the regulation of apoptosis processes, regulates the cell cycle, influences the course of immunological reactions through T-cells and blocks the activation of macrophages and lymphocytes. The β 1 form is a major factor in stimulating soft tissue regeneration and wound healing. TGF- β is involved in the regulation of the tumor process, systemic connective tissue lesions, cardiovascular system and the development of degenerative diseases of the nervous system⁵⁰. Transforming growth factor- β is synthesized by many

⁴⁶ Yamazaki M et al., 2018, p.352

⁴⁷ Labzin LI et al., 2016, p. 37

⁴⁸ Nanda RPG et al., 2019, p.56

⁴⁹ Maulani C et al., 2019, p. e5106

⁵⁰ Gomes FI et al., 2016, p.2

cells, which may also have receptors for such a protein. A significant amount of this factor is synthesized by macrophages.

In the development of inflammatory lesions of the periodontium role of TGF- β is assigned in the initial stages as a signaling between inflammatory cells, and as an initiator of healing and adaptive reactions. TGF- β 1 decreases with intense inflammation of periodontal tissues, and increases during the healing phase (recovery of soft tissues and bone tissue). An increase in TGF- β 2 levels in the gingival fluid is observed when the regeneration of periodontal tissues slows down⁵¹.

Interleukin-1 (IL-1) system. This group of interleukins includes 11 related cytokines (IL-1 α and 1 β , interleukin 1 antagonist, IL-18, IL-36 α , IL-36 β , IL-36 γ , IL-36RA, IL-37, IL-38, IL-33) – they are powerful pro-inflammatory cytokines that are synthesized by different cells. Exceptions are IL-37 and IL-38 which have anti-inflammatory properties. IL-1 can affect all organs and systems of the body (both independently and in interaction with other pro-inflammatory factors) – they are the main pathogenetic mediators of autoimmune, inflammatory, infectious and degenerative processes. This group of cytokines mainly stimulates T-lymphocytes and maturation of B-lymphocytes, causes pro-inflammatory and pyrogenic action, enhances the function of neutrophilic granulocytes, provides the links between the immune, nervous and endocrine systems⁵². IL-1 β , IL-18 is synthesized by monocytes, macrophages, dendritic cells, and IL-1 α is synthesized by endothelial cells, keratinocytes, fibroblasts, platelets, epitheliocytes and astrocytes.

In the development of inflammatory lesions of the periodontium this group of cytokines is actively involved. In this case, IL-1 α acts as a signaling molecule for tissue damage to the immune system, enhances the course of inflammatory reactions, and stimulates the release of other pro-inflammatory cytokines by other cells. In general, it is a marker of the intensity of the inflammatory process in the periodontium, which can enhance the resorption of bone tissue by signaling the presence of bacterial antigens in the inflammatory focus. IL-1 β also acts indirectly by stimulating the production of pro-inflammatory mediators IL-6 and prostaglandin E2, and increases the activity of neutrophilic granulocytes. This fraction of the cytokine IL-1 plays a key role in the course of inflammatory reactions, enhances the resorption of bone tissue of the jaws. The growth of IL-18 is also found in the gingival fluid during inflammatory processes in the periodontium and there is a direct correlation of its level with clinical signs^{53 54}. As a therapeutic target, IL-1 was used in the development of the medicine “Anakinra” (a blocker of receptors for IL-1) which was created for the treatment of rheumatoid arthritis. Also known studies on the development of antibodies to IL-18⁵⁵.

Interleukin-2 (IL-2) is a mediator of inflammation and immunity. It is basic in the IL-2 family (also includes IL-4, IL-7, IL-9, IL-15 and IL-21) - the main function is to activate the differentiation of T-helpers and T-killers, NK and immunoglobulin synthesis B-lymphocytes. This interleukin is highly important in maintaining the function of antitumor and transplant immunity, as well as the containment of certain parts of the

⁵¹ Um S et al., 2018, p.8

⁵² Talvan ET et al., 2017, p. 09

⁵³ De Alencar JB et al., 2020, p.e0227905

⁵⁴ Rodríguez-Montaña R et al., 2015, p.39

⁵⁵ Zhang Y et al., 2021, p.15.

immune system. It is produced by T-lymphocytes, transformed T- and B-lymphocytes, leukemic cells.

In the development of inflammatory lesions of the periodontium IL-2 was not described separately, its growth was determined during the transformation of T-lymphocytes into Th1 under the influence of pathogens from the periodontal pocket, while along with the synthesis of IL-2. As a therapeutic target for the treatment of periodontal disease at the moment the development of science IL-2 is not promising⁵⁶.

Interleukin-4 (IL-4) – a cytokine that stimulates T-helpers, enhances the proliferation of B-lymphocytes and their conversion into plasmocytes, increases the production of immunoglobulin E (IgE), and reduces the production of individual T-lymphocytes, macrophages, dendritic cells and IFN- γ production. Therefore, it acts as an anti-inflammatory cytokine. Interleukin-4 is involved in the development of allergic reactions, promotes intensive tumor growth, its participation in the development of neurodegenerative diseases, as well as in the development of the infectious process in HIV. IL-4 is produced by mast cells, T-helpers, eosinophils and basophils.

In the development of inflammatory lesions of periodontal tissues IL-4 participates as an inhibitor of the inflammatory process, so in the active duration of periodontitis its level in the gingival fluid decreases sharply. In periodontal tissues IL-4 inhibits the proliferation of Th2 cells which reduces inflammatory process and indirectly promotes tissue repair⁵⁷.

Interleukin-5 (IL-5, eosinophilic colony-stimulating factor) is a pro-inflammatory cytokine that causes the maturation and activation of eosinophils, as well as activates B-lymphocytes. It is described that activated eosinophils are able to damage surrounding cells (including the vascular wall) by direct cytotoxic effects and the involvement of other cells. Eosinophils can secrete highly toxic cytoplasmic proteins – basic alkaline protein, eosinophilic cationic protein, eosinophilic peroxidase, eosinophilic neurotoxin, and additionally secrete a number of cytokines.

In the development of inflammatory lesions of the periodontium IL-5 has not been studied separately. Its level increases along with other pro-inflammatory and anti-inflammatory cytokines (IL-1, IL-4, IL-6, IL-10 and IL-13) upon activation of Th2 cells in response to the development of the inflammatory process. IL-5 is therapeutic target in control of inflammation. Monoclonal antibodies to IL-5 – “Mepolizumab” and “Reslizumab” were developed and introduced into clinical practice in some countries⁵⁸.

Interleukin-6 (IL-6) – is one of the most powerful pro-inflammatory mediators in acute inflammation. In muscle tissue, it can act as an anti-inflammatory cytokine (myokine). IL-6 affects almost all organs and systems – blood, liver, immune and endocrine systems, metabolism. It causes the mobilization of energy reserves which is necessary when the body temperature rises, affects muscle and adipose tissue, stimulates the proliferation and differentiation of B- and T-lymphocytes, increases the synthesis of C-reactive protein. Excessive production of IL-6 is observed in cases of massive injuries, burns and autoimmune processes. IL-6 triggers joint damage, activates osteoclasts, which causes bone damage. IL-6 is secreted by macrophages, epitheliocytes, keratinocytes after activation by pathogen-bound molecules – particles of viruses, bacteria, fungi and some lipo-polysaccharides.

⁵⁶ Costantini E et al., 2020, p.69

⁵⁷ Tsai CC et al., 2007, p.7

⁵⁸ Ramadan DE et al., 2020, p.483

In the development of inflammatory lesions of the periodontium IL-6 takes an active part, as evidenced by the increase in its level in the gingival fluid in the active course of inflammation and fall in the attenuation of the inflammatory process. IL-6 enhances the intensity of inflammation when activating Th2 and Th17 cells. Separately, IL-6 interacts with bone tissue through the RANK system, which stimulates osteoclast proliferation and supports bone resorption⁵⁹. IL-6 is a therapeutic target for the development of specific antibodies, as well as blockers of its receptors - "Siltuximab", "Tocilizumab", "Sarilumab", which are approved for use in the clinic, studies are continued for medicines "Clazakizumab", "Olokizumab", "Sirukumab", "Elsilimomab", "Levilimab" and others. Also, the effect of inhibition of IL-6 production in neurons was obtained with the use of the flavonoid luteolin⁶⁰.

Interleukin-8 (IL-8) is also a pro-inflammatory cytokine (chemokine). It is a powerful endogenous chemoattractant (causes migration of leukocyte cells - neutrophilic granulocytes, macrophages, lymphocytes and eosinophils), acts as an activator of leukocytes, enhances the generation of reactive oxygen species. It also plays an important role in the mechanisms of innate immunity. IL-8 is involved in the processes of mitogenesis, inhibition of angiogenesis, inflammation, chemotaxis, neutrophil degranulation, leukocyte activation, tissue regeneration and remodeling, and calcium homeostasis. IL-8 is synthesized by macrophages, endothelial cells, fibroblasts and epithelial cells.

In the development of inflammatory lesions of the periodontium IL-8 participates at the early stages of the inflammatory process by stimulating the chemotaxis of inflammatory cells to the affected tissues of the marginal periodontium. Therefore, with inflammation in the periodontal tissues the level of IL-8 in the gingival fluid increases⁶¹. As a blocker of IL-8, monoclonal antibodies "HuMax-IL8" were developed, which continue to be studied.

Interleukin-10 (IL-10) - is the main anti-inflammatory cytokine which is a key regulator of the inflammatory response and acts as an antagonist for a significant list of pro-inflammatory factors and mediators. IL-10 has a pleiotropic anti-inflammatory effect which is to inhibit IFN synthesis by inhibiting T-lymphocyte proliferation, slows the synthesis of TNF- α and IL-6 but is able to stimulate IgE thereby enhancing humoral immunity. IL-10 is also an important regulator of tolerance to transplanted organs, protection of tissues from damage during ischemia and inhibition of neurodegenerative diseases. IL-10 is synthesized in monocytes, lymphocytes and mast cells⁶².

In the development of inflammatory of the periodontium IL-10 takes an active part as an inhibitor of inflammatory reactions, by inhibiting the production of other pro-inflammatory cytokines. Its concentration in the gingival fluid is inversely proportional to the intensity of the inflammatory reaction. IL-10 in the process of inflammation in the periodontium is secreted by activated Th2 cells, T-reagins; IL-10 affects macrophages, polymorphonuclear leukocytes and periodontal fibroblasts, which inhibit the secretion of TNF- α , IL-6, prostaglandins E2, IL-1 β , thereby blocking the processes of activation and reproduction of osteoclasts and, accordingly, the resorption of alveolar bone tissue

⁵⁹ Batool H et al., 2018, p.8531961

⁶⁰ Chatzopoulos GS et al., 2017, p.457

⁶¹ Finoti LS et al., 2017, p. e6932

⁶² Chatzopoulos G et al., 2018, p.e11

⁶³. Since the 90s of the XX century, IL-10 is considered as a therapeutic target of various inflammatory processes, studies of the use of recombinant human IL-10 are in progress.

Interleukin-12 (IL-12) belongs to the family of heterodimeric cytokines (it also includes IL-23, IL-27, IL-35). IL-12 is a promoter of the inflammatory process, a key cytokine of the cell-mediated immune response, stimulates the proliferation of activated T-lymphocytes, NK cells and cytotoxic cells, production of IFN- γ and TNF- α , inhibits the synthesis of immunoglobulin. IL-12 also inhibits angiogenesis and deepens autoimmune responses. IL-12 is secreted by activated B-lymphocytes, monocytes and macrophages, neutrophils and dendritic cells⁶⁴.

With the development of inflammatory lesions of the periodontium in the gingival fluid can be determined by an increase in the concentration of IL-12. It is involved in the differentiation of Th0 cells into Th1, which become producers of IFN- γ , IL-2 and TNF- α . IL-12 is a therapeutic target for monoclonal antibodies - "Ustekinumab"⁶⁵.

Interleukin-13 (IL-13) - is similar to IL-4 in structure and function, and plays an important role in the development of a number of allergic diseases (including respiratory lesions), the main mechanism of action - stimulation of IgE synthesis through activation of B-lymphocytes, also under the influence of IL-13 increases the secretion of mucus components by mucous membranes which increases bronchial lavage. Also, IL-13 is a leading mediator in the formation of inflammatory granulomas in tissues during helminth invasion, and others. In addition, IL-13 is a stimulator of migration and survival of epithelial cells, production of nitric oxide by airway epithelium, activation of macrophages, transformation of fibroblasts into myofibroblasts which leads to the accumulation of collagen and the development of fibrotic changes in the respiratory system. IL-13 is secreted from T-helpers, CD4-cells, NK, mast cells, basophils, eosinophils and nuocytes.

In the development of inflammatory and lesions of the periodontium IL-12 has not been studied separately, it acts as a synergist of IL-4 and its synthesis is enhanced by stimulation of IL-4 Th2 cells. IL-13 is a therapeutic target in the treatment of bronchial asthma, the monoclonal antibody medicines "Tralokinumab" and "Lebrikizumab" have been developed⁶⁶.

Interleukin-17 (IL-17) - has a family of related cytokines (cytokines of the so-called "cysteine node", including IL-17B, IL-17C, IL-17D, IL-17F and IL-17E, also known as IL-25). IL-17 is a pro-inflammatory mediator that is also involved in the development of allergic reactions. The IL-17 family is involved in the regulation of numerous protective immune responses by stimulating the production of many signaling molecules - IL-6, colony-stimulating factor-3 (granulocytes), colony-stimulating factor-2, IL-1 β , TNF- α , chemokines (IL-8, GRO- α , MCP-1 - monocyte chemotaxis factor) and prostaglandin E2, - from many cells. Cytokines-17 are involved in the development of psoriasis and bronchial asthma, regeneration of nervous tissue after ischemic lesions⁶⁷. IL-17 is secreted from many cells - neural tissue, muscular tissue, T-lymphocytes, peripheral blood vessels. During inflammation in the periodontium its source is activated Th17 lymphocytes.

⁶³ Shi T et al., 2020, p.357

⁶⁴ Tsai IS et al., 2005, p.40

⁶⁵ Issaranggun Na Ayuthaya B et al., 2018, p.75

⁶⁶ Beklen A, 2017, p.380

⁶⁷ Isaza-Guzmán DM et al., 2015, p.99

In the development of inflammatory lesions of the periodontium IL-17 is involved at different stages, as evidenced by its growth in the gingival fluid during inflammation; its main effect is to maintain the overall inflammatory response and support the proliferation of osteoclasts and subsequent resorption of bone tissue of the dental alveoles⁶⁸. Therapy aimed at blocking IL-17 is a real direction in medicine, the medicines with monoclonal antibodies “Secukinumab”, “Ixekizumab” and “Brodalumab” were developed and tested for the treatment of systemic lesions.

Interleukin-21 (IL-21) is a homologue of IL-2, IL-4 and IL-15. IL-21 regulates the processes of antitumor and antiviral protection, also reduces the intensity of allergic reactions. IL-21 stimulates the growth and differentiation of T cells, B cells (including the formation of memory B-cells), increases the activity of NK. IL-21 is considered a potential direction for the treatment of HIV infection. IL-21 is produced by activated T lymphocytes and can also be produced by tumor cells in cases of Hodgkin’s lymphoma.

With the development of inflammatory lesions of the periodontium in the gingival fluid can be found elevated levels of IL-21 which correlates with the intensity of inflammation. Available data on its effect on the level of tissue destruction in periodontitis, IL-21 is also considered as a biomarker of inflammation in periodontitis⁶⁹. IL-21 and its receptors are considered as a therapeutic target for the development of immunobiological medicines for the treatment of autoimmune and systemic inflammatory diseases.

Interleukin-22 (IL-22) is a homologue of IL-10. It is synthesized by many cells in the site of inflammation, mainly affects non-hematopoietic cells – stroma and epithelium, supports cell survival, proliferation and synthesis of antimicrobial substances, as well as tissue regeneration processes. Dysfunction of IL-22 is observed in the development of autoimmune diseases – rheumatoid arthritis, systemic lupus erythematosus, psoriasis. IL-22 simultaneously has pro-inflammatory properties and performs the function of protecting cells from the effects of the inflammatory process. IL-22 is produced by T cells (Th17 series), NK, neutrophils, macrophages and dendritic cells. IL-22 plays a key role in the synthesis of human β -defensin-2 (hBD-2).

In the development of inflammatory and inflammatory-dystrophic lesions of the periodontium IL-22 acts as a synergist of anti-inflammatory IL-10, data are available on its positive effect on the regeneration of periodontal tissues. In cases of chronic periodontitis, the level of this cytokine increases in the gingival fluid⁷⁰.

Interleukin-23 (IL-23) is a pro-inflammatory cytokine belonging to the IL-12 family. IL-23 stimulates T cells to proliferate and expand, as well as indirectly, due to increased levels of IL-17, IL-21, IL-22 and colony-stimulating factor-2, affects protection against extracellular parasites – bacteria and fungi, the formation of barrier immunity and recognition of antigens, the development of autoimmune processes in nervous tissue and its regeneration after hemorrhage. Stimulates the growth and formation of blood vessels. IL-23 plays role in the development of psoriasis, allowed participation in the development of atherosclerosis and cardiovascular lesions. IL-23 is secreted by activated T cells, monocytes, macrophages and dendritic cells.

In the development of inflammatory lesions of the periodontium IL-23 participates as a pro-inflammatory cytokine, the level of which increases in patients with chronic

⁶⁸ Wankhede AN et al., 2019, p.8

⁶⁹ Lokhande RV et al., 2019, p.24

⁷⁰ Sidharthan S et al., 2020, p.503

and acute periodontitis⁷¹. IL-23 is a therapeutic target for a number of autoimmune diseases, are monoclonal antibodies “Ustekinumab”, “Guselkumab”, “Tildrakizumab” and “Risankizumab” have been developed.

Interleukin-33 (IL-33) – belongs to the IL-1 family. It is a pro-inflammatory cytokine that has pleiotropic protective responses. In the extracellular environment, it stimulates the secretion of cytokines of the IL-2 family from T-helpers, mast cells, eosinophils and basophils. IL-33 affects the function of keratinocytes in the skin, especially in the development of allergic reactions, causes itching. In the middle of the cell, it acts as a nuclear factor that promotes the formation of the DNA helix, which is found in the endothelium of small vessels with prolonged inflammation. The role of IL-33 has been proven in the development of bronchial asthma, allergies, endometriosis, allergic rhinitis (hay fever), chronic colon inflammation, energy mobilization from adipose tissue. IL-33 is secreted by numerous cells, including fibroblasts, mast cells, dendritic cells, macrophages, osteoblasts, endothelial cells, and epithelial cells.

In the development of inflammatory lesions of the periodontium IL-33 plays a role in increasing inflammation, indirect stimulation of bone resorption, as well as the possibility of increasing the secretion of IL-33 in the presence of periodontal pathogen *Porphyromonas gingivalis*⁷². IL-33 is considered as a therapeutic target for the treatment of periodontitis in elderly patients, so today the development of monoclonal antibodies to interleukin itself, as well as to its ST2 receptors is in progress.

Interleukin-35 (IL-35) is a newly discovered anti-inflammatory cytokine that belongs to the IL-12 family. Its influence on the inflammatory process is an indirect effect on the reproduction and differentiation of lymphocytes, interaction with T-helpers. Genetic defects that affecting the expression of this cytokine lead to the development of a number of severe autoimmune diseases (systemic lupus erythematosus, psoriasis, colitis, type I diabetes, multiple sclerosis, autoimmune hepatitis). Experimentally established that increased expression of IL-35 leads to the activation of chronic viral infections. An increase in its level was also observed in the development of some malignant tumors. IL-35 is normally produced by T- and B-lymphocytes, but upon activation it can be expressed in vascular endothelium, smooth myocytes, and others.

In the development of inflammatory and inflammatory-dystrophic lesions of the periodontium IL-35 plays the role of inhibitor of inflammatory processes and stimulator of periodontal tissue repair and normalization of their function⁷³. IL-35 itself is considered as a therapeutic target, for which the creation of recombinant drugs is hypothetically possible.

Conclusions

Thus, at the current moment of development of medicine, according to the results of the study of the role of individual cytokines in the development of inflammatory and restorative reactions in periodontal tissues, information on pro-inflammatory and anti-inflammatory function has been established. Despite the lack of a complete picture of the pathogenesis of periodontal disease, some involved cytokines and their receptors in periodontal tissues are considered as markers of inflammation and regeneration processes, as well as therapeutic targets for the use of immunobiological blockers

⁷¹ Sadeghi R et al., 2018, p.80

⁷² Rodrigues WF et al., 2017, p.4

⁷³ Schmidlin PR et al, 2021, p. 139

(monoclonal antibodies). Of course, such therapy is developed for systemic inflammatory and autoimmune diseases but the likelihood of their use in periodontology also looks promising.

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CLINICAL EVALUATION OF THE EFFECTIVENESS OF APPLICATION OF PHOTOACTIVE DISINFECTION IN THE TREATMENT OF LOCALIZED PERIODONTITIS IN CHILDREN

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Annotation. Laser technology opens a new promising direction in the treatment of periodontal disease. The antibacterial effect of the red diode laser is an important aspect of

its multifactorial effect on biological systems. This effect of laser radiation in combination with its unique biostimulating properties can be used for selective inhibition of pathogenic microflora sensitized by drugs activated by laser light of relatively low power. Given that in the pathogenesis of periodontal disease, the infectious factor is crucial, the relevance of studying aspects of photodynamic therapy may become in the near future a real alternative to traditional methods of antibacterial action. The main goal of the study was to increase the effectiveness of treatment of localized forms of periodontitis in children of Transcarpathia the method of photodynamic therapy. The study included the treatment of localized forms of periodontitis in 117 children in the Upper Tysa region aged 12 to 15 years. Real-time polymerase chain reaction (PCR) was used to study saliva samples and the contents of periodontal pockets to detect species-specific DNA fragments of *Streptococcus oralis*, *Streptococcus sanguis*, *Streptococcus sobrinus*, *Porphyromonas gingivalis*, *Treponema denticola*. Analysis of oral biotope contamination by periodontal pathogens before and after treatment allowed to evaluate the effectiveness of periodontitis treatment. The effectiveness of combination treatment (antimicrobial topical therapy and exposure to red diode laser "Fotosan 630"), accompanied by regression of inflammatory reactions in periodontal tissues, reduction of total relative tissue contamination with periodontopathogenic microorganisms *Streptococcus oralis*, *Streptococcus sanguis* improving the clinical course of periodontitis.

Keywords: Periodontitis, periodontopathogenic microflora, red diode laser FotoSan 630, children, PDT (photodynamic therapy), PCR (polymerase chain reaction).

Introduction

Among dental diseases, one of the first places in terms of frequency and prevalence is occupied by periodontal tissue lesions - according to the WHO, in different age groups the incidence of gingivitis and periodontitis reaches 80% -100% [15]. In Ukraine, inflammatory periodontal disease is an urgent problem, not only medical but also social. The prevalence of major dental diseases depends on age [15,16]. Interesting data are given by Smolyar NI [16]: periodontal diseases are found in 6% in 3-6 year old children and in 90% of cases in 12-17 years, as well as in the presence of dental anomalies and a number of concomitant dental diseases. The level of dental health in children is closely linked to an increase in the relative weight of the risk factors for the formation and progression of diseases of hard and soft tissues of the oral cavity, which is reflected in the structure of the main dental diseases. Transcarpathia refers to the climate-geographic zone with a low level of fluoride and iodine in the environment, and as shown by epidemiological surveys «very high» according to WHO criteria, the level of intensity of major dental diseases associated with a deficit in the daily intake of iodine and fluorine [9]. One of the rather complex species species of human ecosystems is the oral cavity, which is widely represented as both opportunistic and pathogenic microorganisms [14]. The activity of the microbiota in the periodontal pocket often contributes to the destruction of the gingival apparatus, up to the resorption of the alveolar bone, promotes sensitization of the macroorganism, changing the immunoreactivity, and is often associated with somatic pathology [11,12]. According to modern ideas, the resident flora of the oral cavity is mainly represented by facultative and obligate-anaerobic *Streptococcus salivarius*, *Streptococcus oralis*, *Streptococcus mutans*, *Streptococcus mitis*, *Streptococcus sanguis* and peptostreptococci.

High frequency of detection of veilonel and diphtheroids [10,12,14]. At the same time, high informativeness as an auxiliary biomarker of infectious and inflammatory periodontal diseases of another species - *Streptococcus sobrinus*, the relative number of which varies at different stages of the disease [14]. In addition to opportunistic pathogens in the places of greatest destruction of the periodontium are also more common than others *Porphyromonas gingivalis* and *Treponema denticola*, which are found mainly in the chronicity of the inflammatory process [11,12]. The latter, however, are found in healthy people in intact periodontium. The main part of microorganisms that initiate infectious and inflammatory periodontal diseases are anaerobes and, accordingly, their cultivation and identification is quite a difficult task. In this regard, in recent years, increasingly promising developments related to the design of diagnostic systems based on methods of nucleic acid amplification, in particular the method of polymerase chain reaction (PCR), which does not involve the selection of pure culture and is highly sensitive and specificity [14]. However, the most widely used currently high-quality variants of this method, which provide electrophoretic detection of amplification products, is characterized by complexity, relatively low reproducibility and risks of contamination. This significantly limits the diagnostic capabilities of PCR, in particular, at the stage of monitoring the effectiveness of treatment. In this regard, high interest in real-time PCR, which along with high specificity and sensitivity is characterized by high productivity, speed of results and no risk of contamination in the laboratory, which is an advantage in assessing the effectiveness of treatment [12,14]. Despite the fact that antibiotic therapy is today the main component of treatment, the problem is the antibiotic resistance of certain strains of pathogenic microorganisms in the tissues of the oral cavity, in particular, periodontal pockets: *Str. Pyogenes*, *St. Aureus* et al. [1,2,3,4,5] and a high level of sensitization to certain groups of antibacterial drugs, resulting in the effectiveness of traditional methods of treatment of periodontitis is reduced. At the same time, the stage of local antibacterial therapy is one of the most important in the complex treatment of periodontitis. Today there are a large number of drugs for local and systemic effects on the microflora of periodontal pockets. Frequent and irrational use of antibacterial agents leads to an imbalance in the associations of microorganisms, the emergence of resistant strains, insensitive or insensitive to treatment, as well as the occurrence of side effects of drugs [3, 4]. On the other hand, due to the insufficient effectiveness of monotherapy with antibacterial agents to achieve high-quality antimicrobial effects on periodontal tissues or its ineffectiveness in some clinical cases, there is a need for alternative antimicrobial therapy. This method in periodontology is the use of red diode radiation. The method of photodynamic therapy (PDT) is known as effective and safe in the treatment of inflammatory periodontal diseases, which can be effectively used to prevent exacerbations of chronic inflammatory periodontal disease, helps to achieve a long period of remission and even avoid the need for surgical treatment [6, 7,10,13]. This area of research is actively developing today, but some aspects of its antibacterial effect need to be clarified.

PRESENTATION OF THE MAIN MATERIAL OF THE ARTICLE. The aim was to improve the clinical efficacy of standard protocols for the treatment of localized forms of periodontitis in children of Transcarpathia, using the method of photodynamic therapy.

MATERIALS AND METHODS. The clinical study was conducted on the basis of the dental office of the polyclinic department of the Bertalon Linner Berehovo City Hospital and the University Dental Clinic of the Uzhhorod National University. 117 patients aged

12 to 15 years, who were treated for localized forms of periodontitis, were under clinical supervision, under the supervision and written consent of their parents. When making a diagnosis of localized periodontitis used the conventional classification International Statistical Classification of Diseases and Related Health Problems. According to the severity, 61.5% of patients were diagnosed with a mild degree of acute localized periodontitis, and 38.5% - moderate. Depending on the method of treatment, all patients included in the study were divided into 2 groups: experimental group №1 (control) - 57 patients, experimental group №2 - 60 patients (**table 1**). In group №1 treatment was carried out according to the standard conservative local method, which included: professional oral hygiene and modern antimicrobial drugs of local action [8]: gel application "Metrogil dent" 2 times a day for 20-30 minutes (7 days of treatment) and application of Hexoral aerosol 1 spray 2 times a day (10 days of treatment); in group №2 - combined treatment was performed, which included the standard conservative local method (applications "Metrogil dent", "Hexoral" and occupational oral hygiene) and photodynamic therapy. The standard protocol for treatment of periodontal pocket (PC) with red diode radiation included: in each pre-dried PC, using a syringe with a nozzle 22G injected photosensitizer aqueous solution of toluidine blue FotoSan Agent (toluidine blue) with a concentration of 0.1 mg / ml and a viscosity of Medium, given the peak of light adsorption for this substance, withstand exposure for 10 seconds, and then irradiated with a laser device FotoSan 630 (CMS Dental, Denmark) in a continuous mode, with an exposure time of 60 seconds with an output power of 2,000-4,000 mW / cm², inserting his Perio nozzle 15 mm directly into the periodontal pocket. The material for further molecular genetic research was the content of periodontal pockets of teeth and saliva. The contents of the periodontal pockets were collected with a sterile paper endodontic pin (size №25), which was inserted with tweezers into the periodontal pockets in the deepest areas for 10 seconds and then placed in a sterile plastic tube type Eppendorf (1.5 ml) containing 1 ml of saline. Samples were stored and transported at + 4 ° C for 2 hours. The collection was performed repeatedly for each patient. Transport of batches of samples to the microbiological laboratory Astra-Dia was carried out in thermal containers with refrigerant. The laboratory used Chelex100 ion exchange resin to isolate total DNA from clinical samples. To perform PCR in Real time stomatoflora (periodontoscreen, DK 021: 2015: 33696500-0) used our selected pairs of species-specificity of primers to DNA fragments Porphyromonas gingivalis, Streptococcus oralis, Streptococcus sanguis, Streptococcus dentisla Sybrico, I (LLC "Sintola" according to the manufacturer's instructions). PCR was performed using a detection amplifier CFX96 Touch "REAL TIME" (Bio-Rad, USA). The results were recorded using Bio-Rad CFX Manager software. Statistical analysis of the results was performed using the software package Statistica 6.0. Calculated the percentage and criterion of chi-square (χ^2) with Yates correction. Values were considered significant at $p < 0,001$.

Table 1.

Division of patients into groups depending on the method of treatment of localized periodontitis.

	Acute localized periodontitis, mild	Acute localized periodontitis, moderate	The total number of patients
Experimental group №1 (control)	36	21	57
Experimental group №2	36	24	60

RESULTS AND DISCUSSION. Molecular genetic study of periodontal pockets in Real time stomatoflora revealed all types of major periodontal pathogenic bacteria: Porphyromonas gingivalis 60 (51.28%), Streptococcus oralis 75 (64.1%), Streptococcus sanguis = 36 (30.76%), Streptococcus sobrinus 84 (71.79%), Treponema Denticola 12 (10.25%) (Fig. 1). In the molecular genetic study of saliva samples (Fig. 2) in patients with acute localized periodontitis most often detected Streptococcus sanguis 72 (61.53%), Streptococcus oralis 66 (56.41%) and Streptococcus sobrinus 81 (69.23%) (Fig.2).

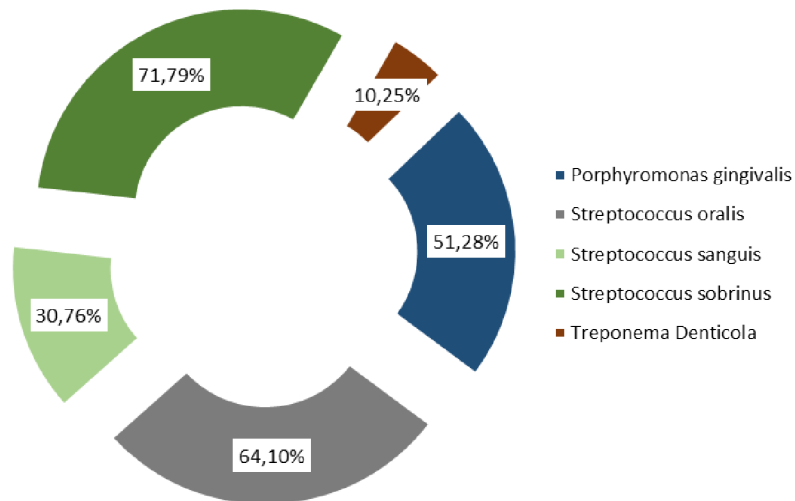


Figure 1. Comparative frequency of PCR detection of periodontopathogenic bacteria in the periodontal pocket in acute localized periodontitis (n = 117).

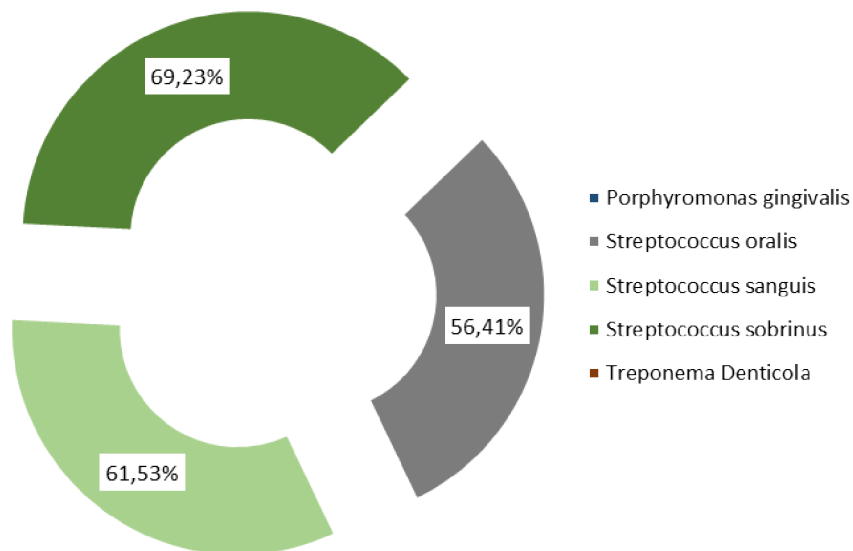


Figure 2. Comparative frequency of PCR detection of periodontopathogenic bacteria in saliva in acute localized periodontitis (n = 117).

PCR detection of microorganisms in the contents of periodontal pockets after standard treatment without the use of PDT acute localized periodontitis showed statistically

significant differences (**table 2**) in the prevalence of a number of bacteria in patients of the study screw: *S.oralis* decreased to 21 (36.84%), ie 21.05% ($\chi^2 = 6.15$, $p = 0.007$). For *S. sobrinus* the positive effect of the treatment was observed in 24 (42.11%), ie by 26.31% ($\chi^2 = 7.22$, $p = 0.009$), for *P. gingivalis* - by 21.06% ($\chi^2 = 6,39$, $p = 0.004$), for *S. Sanguis* - by 10.52% ($\chi^2 = 4.74$, $p = 0.006$), and *T. Denticola*, after treatment, was not detected in the study group. During the PCR study in Real time saliva of the experimental group №1 received positive results, where the value of *S.oralis* decreased by 26.31% ($\chi^2 = 7.11$, $p = 0.008$), *S. Sanguis* - by 26.31% ($\chi^2 = 8.64$, $p = 0.006$), and for *S. Sobrinus* - by 26.31% ($\chi^2 = 7.89$, $p = 0.007$).

Table 2.

Frequency of PCR detection of periodontopathogenic bacteria in the experimental group №1 (use of standard conservative antimicrobial therapy without PDT), n = 57

	The contents of periodontal pockets		Saliva	
	Before treatment	10 days after treatment	Before treatment	10 days after treatment
<i>Porphyromonas gingivalis</i>	27 (47,37%)	15 (26,31%)	0	0
<i>Streptococcus oralis</i>	33 (57,89%)	21 (36,84 %)	39 (68,42 %)	24 (42,11 %)
<i>Streptococcus sanguis</i>	15 (26,31%)	9 (15,79%)	33 (57,89 %)	18 (31,58 %)
<i>Streptococcus sobrinus</i>	39 (68,42%)	24 (42,11%)	42 (73,68 %)	27 (47,37 %)
<i>Treponema denticola</i>	6 (10,53%)	0	0	0

PCR study of clinical material in the experimental group of patients №2 treated with a combined method using PDT using a laser device FotoSan 630 (CMS Dental, Denmark), showed a decrease in the frequency of detection of *P.gingivalis* in the periodontal pocket by 40%, $\chi^2 = 8.16$, $p = 0.004$; *S. oralis* - by 60%, $\chi^2 = 9.36$, $p = 0.004$, in saliva by 30%, $\chi^2 = 6.22$, $p = 0.006$; *S. sobrinus* - by 60%, $\chi^2 = 8.69$, $p = 0.008$, and in saliva - by 50%, $\chi^2 = 5.48$, $p = 0.006$). After treatment of localized periodontitis in the experimental group №2 *S. Sanguis* and *T. denticola* by PCR study was not detected (**table 3**).

Table 3.

The frequency of PCR detection of periodontal bacteria in the experimental group №2 (use of standard conservative antimicrobial therapy in combination with PDT), n = 60

	The contents of periodontal pockets		Saliva	
	Before treatment	10 days after treatment	Before treatment	10 days after treatment
<i>Porphyromonas gingivalis</i>	33 (55%)	9 (15%)	0	0
<i>Streptococcus oralis</i>	42 (70%)	6 (10 %)	27 (45 %)	9 (15 %)
<i>Streptococcus sanguis</i>	21 (35%)	0	39 (65 %)	0
<i>Streptococcus sobrinus</i>	45 (75%)	9 (15%)	39 (65 %)	9 (15 %)
<i>Treponema denticola</i>	6 (10%)	0	0	0

CONCLUSIONS. Real-time PCR in the diagnosis of infectious - inflammatory periodontal diseases associated with opportunistic pathogens of the oral cavity can be used to assess the effectiveness of therapy. Combination treatment of localized periodontitis in children 12-15 years, including standard antimicrobial topical conservative therapy with PDT, effectively reduces the severity of the inflammatory process in periodontal tissues and the frequency of detection in periodontal pockets *P.gingivalis*, *S.oralis*, *S.sanguis*, *S. sobrinus*. The high level of antibacterial efficacy of photodynamic therapy has significant potential in modern practical periodontology.

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DIAGNOSIS AND SURGICAL TREATMENT OF HIATAL HERNIAS

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Abstract. The aim of the study: to improve the effectiveness of diagnosis and surgical treatment of patients with hiatal hernia.

Materials and methods of research. Were examined 56 patients with hiatal hernias (HH), who were treated in the Department of the Digestive Surgery of the State Institution «Institute of Gastroenterology of the National Academy of Medical Sciences of Ukraine» in 2020-2021, of which sliding (axial) HH was detected in 42 (75.0 %) - type I; paraesophageal hernias- in 6 (10.7 %) - type II; mixed HH (combination of types I and II) in 8 (14.3 %) - type III. The diagnosis was established by esophagogastroduodenoscopy (with NBI mode, high resolution), X-ray examination, manometry.

Research results and their discussion. After confirmation of the diagnosis of HH, surgical treatment (antireflux surgery) was performed in 56 (100 %) patients. The choice of method of antireflux reconstruction was determined by the severity of reflux and the nature of the contractile activity of the esophagus. The reconstruction by Nissen with full fundal mobilization and a dissection of gastro-splenic and esophageal-diaphragmatic ligaments - Floppy-Nissen was carried out in case of revealed esophageal normokinesia and the expressed reflux. In patients with minimal manifestations of reflux or esophageal motility disorders with anatomical features, reduction of the size of the fundus and stomach - partial circular or anterior funduplications were performed. Thus, crurorraphy was performed in 100.0%. Laparoscopic funduplications were performed by Nissen modification in 36 (64.3%) patients, by Toupet modification in 6 (10.7%) patients and by Dor modification in 3 (5.4%) patients. 11 (19.6%) patients underwent surgery according to a new technique that provides reliable restoration of physiological cardia

and preservation of the anatomical relationship between the diaphragm and the area of the esophageal-gastric junction and includes crurorrhaphy and fundoplication.

Conclusions. The proposed method of surgical treatment of physiological cardia insufficiency in HH is less traumatic than known. The application of the proposed method provides reliable restoration of physiological cardia and preservation of the anatomical relationship of the diaphragm and the area of the esophageal-gastric junction, reduces the risk of bleeding and hyperfunction of the cardia. In the postoperative period, this method of surgical treatment reduces the likelihood of recurrence of physiological cardia insufficiency, dysphagia and recurrence of the disease.

Key words: hiatal hernia, laparoscopic fundoplication, crurorrhaphy.

Introduction. Hiatal hernias occupies one of the first places in prevalence in modern gastroenterology [1, 2]. Timely diagnosis and treatment of HH and reflux esophagitis, which often accompanies hernia, is one of the most pressing problems of the last decade in surgical gastroenterology. There is an annual increase in the number of patients with this nosology, and the proportion of complicated forms is growing accordingly. The most severe complications include ulcer, peptic stricture and intestinal metaplasia of Barrett, which ranges from 11 to 50% [3].

In Ukraine, the frequency of GERD has been insufficiently studied, multicenter studies have not been conducted, and, according to some authors, the incidence of GERD is 37.7-38.9%. Progression of the disease in 2-7% of patients leads to esophageal ulcer, in 4-20% - to peptic stricture of the esophagus, in 7% of patients - to the development of Barrett's esophagus, which is an obligate precancer and increases the annual risk of esophageal adenocarcinoma by 0.12 times [4, 5].

A number of factors play an important role in the occurrence of reflux from the stomach into the esophagus: failure of the lower esophageal sphincter; temporary episodes of lower esophageal sphincter relaxation; insufficiency of esophageal clearance; pathological changes in the stomach, increasing the severity of physiological reflux. In more than 85% of cases, episodes of decreased intraesophageal acidity lower than 4 are not accompanied by any feelings [6].

Conservative antireflux therapy is symptomatic because it does not eliminate the main causes of the disease - HH and physiological cardia insufficiency. The only radical way to restore the function of the cardiac sphincter and eliminate gastroesophageal reflux is surgery. Mini-invasive interventions have changed the ratio of operations for HH, as well as significantly expanded the indications for surgical treatment. The main task of surgical treatment is the correction of anatomical and physiological disorders: elimination of diaphragmatic hernia, correction of antireflux function of the lower esophageal sphincter due to fundoplication and crurorrhaphy, ensuring free antegrade passage of food [7, 8, 9]. The purpose of these operations is to create optimal conditions for the restoration of the antireflux mechanism of the esophagocardial zone. Despite many years of experience in laparoscopic interventions in HH surgery, many issues are under discussion, remain relevant and require practical solutions [10].

The aim of the study. To improve the effectiveness of diagnosis and surgical treatment of patients with hiatal hernia.

Research results and their discussion. Were examined 56 patients with hiatal hernias (HH), who were treated in the Department of the Digestive Surgery of the State

Institution «Institute of Gastroenterology of the National Academy of Medical Sciences of Ukraine» in 2020-2021, of which sliding (axial) HH was detected in 42 (75.0 %) - type I; paraesophageal hernias - in 6 (10.7 %) (type II); mixed HH (combination of types I and II)- in 8 (14.3 %) (type III) (ICD-10 code - K 44.). Among the examined patients with HH, ie with lower esophageal sphincter insufficiency, there were 13 men (23.2 %) and 43 women (76.8 %). The age of patients ranged from 25 to 68 years. The mean age of patients was (53.50 ± 3.89) years. To identify changes in general clinical indicators of blood in all patients used a unified method of determining the general analysis of blood, liver and kidney complex, coagulogram, indicators of carbohydrate metabolism.

To visually assess the condition of the mucous of the esophagus, stomach, duodenum in pathology of the esophagogastroduodenal area were performed endoscopic studies in the department of minimally invasive endoscopic interventions and instrumental diagnostics of the Institute using EVIS EXERA III OLYMPUS 190 (with HD NBI mode) and videogastroscope PENTAX EG-290 Kp (Japan) with biopsy and histological examination.

To establish and confirm the diagnosis, patients underwent X-ray examination of the esophagus, stomach, duodenum. The X-ray examination consisted of review radiography, and radiography of the esophagus, stomach, duodenum using barium sulfate (ATC code VO8BF02), on the device OPERAT90SEX. Special techniques and techniques were used to detect insufficiency of the esophageal-gastric junction. Polypositional radiography was performed in the vertical, horizontal position of the patient, in the position of Trendelenburg, at the time of lifting the device, with forced breathing.

To register the motional and kinetic function of the esophagogastroduodenal zone (measurement of sphincter tone), balloon manometry under endoscopic control was used. The research is performed by an original device for studying the motility of the gastrointestinal tract MNH-01 (protected by copyright certificate №923521 "The device for studying the motility of a biological object", and manufactured by the company "Ukrainian Medical Systems".

Results of the research. Analyzing the complaints of the examined patients, it can be noted that the most frequent clinical manifestations in patients with HH and GERD were epigastric pain (83.6 %), heartburn (83.6 %) and belching (76.4 %). In 76.4 % of cases, there was a clinical combination of epigastric pain, heartburn and belching, which was characteristic (according to EGDS and X-ray passage) for sliding HH and GERD with esophagitis. In 18.2% of the examined patients, the most frequent clinical manifestations were a combination of chest pain when swallowing with dysphagia and regurgitation, which was characteristic (according to EGDS and X-ray passage) for paraesophageal HH.

At X-ray examination, the direct symptoms of HH were: absence of stomach gas bladder, prolapse of the gastric mucosa in the distal part of the esophagus, straightening of the angle of His, antiperistaltic movements of the esophagus, movement of the stomach into the thoracic cavity.

Depending on the amount of migration of organs from the abdomen into the thoracic cavity, HH of 1 degree was observed in 24 (42.8 %) patients, HH of 2 degree, when in the esophageal orifice of the diaphragm came out cardia and part of the bottom of the stomach was noted in 27 (48.2 %) patients. The fundus, body or the whole stomach migration into the thoracic cavity qualifies as HH of 3 degree and was noted in 11 (9.0 %) patients.

The EGD was performed in 56 patients with HH. No changes in the shape and diameter of the esophagus were detected in all patients. An increase in the distance between EGJ and hiatus of more than 2 cm was detected in 40 (71.4 %) patients. Prolapse of the gastric mucosa into the esophagus was determined in 22 (39.3 %) cases, the presence of the second entrance to the stomach in 6 (10.7%), cardiac fold of III-IV degree in 51 (91.1 %). Erosions of the lower third of the esophagus were found in 10 (17.8 %) patients, in 5 (8.9 %) patients had esophagitis grade A, and 7 (12.5 %) patients - grade B (according to the Los Angeles classification). The endoscopic data in 54 (96.4 %) patients did not show an increase in gastric size. The gastric mucosa had a normal appearance in 38 (67.9 %) cases. Signs of gastric inflammation were found in 10 (17.8 %) patients, erosions in the antrum of the stomach in 9 (16.0 %) patients. The pylorus had a normal appearance in 46 (82.1 %) patients. Pyloric spasm was detected in 5 (8.9 %) patients.

Thus, endoscopic examination in patients with HH revealed the following most common changes: erosion of the lower third of the esophagus (17.8%); increased distance between EGJ and hiatus more than 2 cm in 40 (71.4%) patients; cardiac fold of III-IV degree in 51 (91.1%) patients; inflammation and erosions in the body and cardiac part of the stomach in 19 (33.8%) and prolapse of the gastric mucosa into the esophagus in 22 (39.3%) patients. These changes may be the main endoscopic markers for the diagnosis of HH or GERD.

According to the results of the study, it was found that in patients with HH, the average of increase in pressure in the cylinder during the passage of the lower esophageal sphincter zone was (12.99 ± 3.25) mm Hg. In patients with type I (sliding or axial) of HH, the pressure during the passage of the lower esophageal sphincter zone was (15.38 ± 4.56) mm Hg. In patients with type II (paraesophageal) of HH, the pressure in the balloon during the passage of the lower esophageal sphincter was (11.55 ± 5.08) mm Hg. In patients with type III (mixed) of HH there was no resistance to the passage of the balloon in the area of the inlet of the stomach was detected. In patients with GERD, the value of pressure in the area of the lower esophageal sphincter was (9.81 ± 3.18) mm Hg. It was found that among patients with type III (mixed) of HH there was no pressure on the balloon during the passage of the lower esophageal sphincter.

Thus, according to the results of the study, the highest pressure was observed in patients with axial HH (15.38 ± 4.56) mm Hg, and the lowest - in patients with GERD (9.81 ± 3.18) mm Hg.

After confirmation of the diagnosis of HH, surgical treatment (antireflux surgery) was performed in 56 (100%) patients. The choice of method of antireflux reconstruction was determined by the severity of reflux and the nature of the contractile activity of the esophagus. The reconstruction by Nissen with full fundal mobilization and a dissection of gastro-splenic and esophageal-diaphragmatic ligaments - Floppy-Nissen was carried out in case of revealed esophageal normokinesia and the expressed reflux. In patients with minimal manifestations of reflux or esophageal motility disorders with anatomical features, reduction of the size of the fundus and stomach - partial circular or anterior funduplications were performed. Thus, crurorraphy was performed in 100.0%. Laparoscopic funduplications were performed by Nissen modification in 36 (64.3%) patients, by Toupet modification in 6 (10.7%) patients and by Dor modification in 3 (5.4%) patients. Fundodiaphragmopexy was performed in 43 (76.8%).

In order to improve the results of treatment in patients with HH and GERD, a new method of surgical correction of physiological cardia failure has been proposed. Thus,

in 11 (19.6 %) patients a new technique was used, which provides reliable restoration of physiological cardia and preservation of the anatomical relationship of the diaphragm and the esophageal-gastric junction and includes crurorraphy and fundoplication. Crurorraphy is performed with U-shaped sutures, which are applied to the right and left walls of the esophagus at the level of the cardia with fixation of the diaphragm crura, corrugated sutures, which are applied to the medial crura of the diaphragm, reduce the esophageal orifice to the outer diameter of the esophagus and perpendicular sutures perform cardiogastroplication of the anterior wall of the stomach, followed by gastroduaphragmopexy.

The effectiveness of treatment in patients was evaluated by the following criteria: clinical disappearance of heartburn, belching, regurgitation, epigastric pain; no erosions in the lower third of the esophagus, no prolapse of the gastric mucosa into the esophagus according to EGD; no prolapse of the stomach into the thoracic cavity, no sphincter insufficiency, no prolapse of gastric mucosa according to X-ray examination; normalization of pressure in the lower esophageal sphincter according to manometry.

During the study of long-term results in patients, in 5 cases (8.9 %) in the long term of the study (up to 6 months) relapses of HH were diagnosed. The postoperative condition of patients operated on by the proposed method was satisfactory, without signs of postoperative dysphagic disorders. In all cases, good direct and long-term results were obtained for up to 1 year.

Conclusion. The proposed method of surgical treatment of physiological cardia insufficiency in HH is less traumatic than known. The application of the proposed method provides reliable restoration of physiological cardia and preservation of the anatomical relationship of the diaphragm and the area of the esophageal-gastric junction, reduces the risk of bleeding and hyperfunction of the cardia. In the postoperative period, this method of surgical treatment reduces the likelihood of recurrence of physiological cardia insufficiency, dysphagia and recurrence of the disease.

The work is part of scientific research work №1 "To study the features of the complicated course of hiatal hernia, gastroesophageal reflux disease, achalasia of the cardia, stenosis of the gastroduodenal area of ulcerative origin and to improve methods of their surgical correction using endolaparoscopic technologies (№ of state registration 0119U102471).

Authors' contributions: the author took part in the development of ideas and research, supervision of patients, processing of results.

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JUSTIFICATION OF THE PREVALENCE OF MAIN MISTAKES AND COMPLICATIONS IN ENDODONTIC TREATMENT OF MANDIBULAR TEETH

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Resume. In recent years, the possibilities of preserving teeth have increased significantly due to the introduction of modern treatment methods. To date, the use of new technologies and materials in combination with biological and regenerative processes allow to obtain a positive treatment result [1].

Analyzing the work of domestic and foreign researchers, it becomes obvious that over the past 30 years in dentistry there has been a huge breakthrough in the treatment of root canals. After all, today, despite the complexity of treatment, endodontic manipulations we can perform with the visualization of the operating field, using many rotary nickel-titanium instruments, ultrasound, various methods and materials for obturation. [2 - 3].

According to foreign researchers, the success of primary endodontic treatment averages about 90%, and re-treatment - 65-75%. This indicates that the dentist now, as 30 years ago, to succeed in the implementation of endodontic manipulations must take into account many factors: the anatomical variation of the structure of root canals, the stage of root development, its topographic location in the dentition, features of the root canal microflora and their sensitivity to antiseptic agents, etiology of complicated caries, general somatic status of the patient, his/her age, because these indicators will primarily depend on the choice of treatment that will provide positive long-term iatrogenic intervention [4 - 6].

Therefore, the question of mistakes and complications arising from endodontic treatment is relevant in the daily visit of the dentist, as information on the frequency of their occurrence at certain stages of treatment, will allow the doctor to pay more attention to these interventions in the endodontic space, taking into account the possibility of their occurrence, which will further increase the success rate of treatment.

The aim of the study. Provide a statistical analysis of the main mistakes in the endodontic treatment of mandibular teeth, analyzing the results of manipulations among the dentists samples.

Research methods. Clinical and laboratory: description of targeted radiographs of endodontically treated teeth according to standardized treatment protocols; statistical methods: StatPlusPro for Windows.

Object of study: 600 sighting radiographs: 318 (53.0%) X-rays of the teeth of the upper jaw, 282 (47.0%) - images of the teeth of the lower jaw.

Subject of research: a sample of 32 dentists (17 male dentists) (53.13%) and 15 female dentists (46.88%), who perform dental care on the basis of the University Dental Clinic,

as well as in within other clinical bases of the dental faculty of Uzhhorod National University.

Connection of work with scientific programs, plans, topics. This work is a fragment of the research of the Department of Orthopedic Dentistry of Uzhhorod National University: "Clinical and laboratory research of modern dental technologies and expert assessment of the quality of treatment methods" (state registration number 0118U004526).

Results of the research. It is proved that radiography is one of the main and most effective diagnostic methods that allow doctors to assess clinical situation before treatment, as well as to assess the quality of treatment and the dynamics of the postoperative process. In the study we formed a sample of targeted radiographs containing 600 images: 318 (53.0%) X-rays of the teeth of the upper jaw and 282 (47.0%) - images of the teeth of the lower jaw. In general, among the entire sample of radiographs 75 (12.50%) were represented by radiographs of incisors (43 / 7.17% of the upper jaw and 32 / 5.33% of the lower), 45 (7.50%) - canines (24 / 4, 0% of the upper jaw and 21 / 3.50% of the lower jaw), 165 (27.50%) - premolars (84 / 14.0% of the upper jaw and 81 / 13.50% of the lower jaw), 315 - molars (167 / 27.83% of the upper jaw and 148 / 24.67% of the lower jaw).

For the convenience of statistical calculation and interpretation of the obtained results, mistakes diagnosed by us in the study of radiographs were divided into two groups: errors at the stage of root canal obturation and errors recorded at the stages of mechanical and medical processing.

As a result of endodontic treatment of mandibular incisors out of 18 cases of registered errors among this group of teeth 18 (72.22%) were verified as those associated with the stage of endospace obstruction (4 / 22.22% - inhomogeneous obstruction, 4 / 22.22% - under-obturation of the endodontic space to the level of apical narrowing, 5 / 27.78% - extrusion of filling material for the apex of the tooth) and 5 (27.78%) - with the stage of mechanical and medical treatment of the root canal (3/16, 67% - perforation of the root wall, 2 / 11,11% - transposition of the apex).

Of the 10 reported cases of mistakes that were observed after treatment of mandibular canines, 9 (90.0%) also related to the obturation (2 / 20.0% - inhomogeneous obstruction, 2 / 20.0% - underobturation of the endodontic space to the level of the apical narrowing, 5 / 50.0% - extrusion of filling material for the area of the apex of the tooth) and 1 (10.0%) - the consequences of mechanical and medical treatment of the endodontic space (1 / 10.0% - transposition of the apex).

In the analysis of targeted radiographs, endodontic interventions in the structure of the mandibular premolars, among 47 cases of registration of mistakes 24 (72.34%) were associated with the stage of obstruction of the endodontic space (13 / 27.66% - inhomogeneous obstruction, 12/25, 53% - under-obturation of the endodontic space to the level of apical narrowing, 9 / 19.15% - extrusion of filling material for the apex of the tooth) and 13 (27.66%) - with the stage of mechanical and medical treatment of the root canal - inhomogeneous obturation, 2 / 4.26% - separation of the endodontic instrument, 3 / 6.38% - perforation of the root wall, 3 / 6.28% - transposition of the apex, 1 / 2.13% - missed root canal).

Of the 98 reported mistakes that were noted after treatment of mandibular molars, 49 (50.0%) related to the stage of obstruction (17 / 17.35% - inhomogeneous obstruction, 17 / 17.35% - underobturation of the endodontic space to the level of the apical narrowing, 15 / 15,31% - extrusion of filling material for the apex of the tooth) and 49 (50,0%) were

associated with the stage of mechanical and medical treatment of endodontic (10 / 10,20% - inhomogeneous obturation, 9/9, 18% - separation of endodontic instrument, 9 / 9,18% - perforation of the root wall, 11 / 11,22% - transposition of the apex, 10 / 10,20% - missed root canal) (table 1).

Table 1.
Distribution of different types of mistakes in endodontic treatment of mandibular teeth

Types of teeth / Types of errors		Cutters	Canines	Premolars	Molars
At the stage of obturation	Inhomogeneous obturation	22,22%	20,00%	27,66%	17,35%
	Underburdening	22,22%	20,00%	25,53%	17,35%
	Extrusion of filling material	27,78%	50,00%	19,15%	15,31%
	Total	72,22%	90,00%	72,34%	50,00%
At the stage of mechanical and medical processing	Expansion of the endodontic space	0,00%	0,00%	8,51%	10,20%
	Separation of the tool	0,00%	0,00%	4,26%	9,18%
	Perforation	16,67%	0,00%	6,38%	9,18%
	Transposition of the apex	11,11%	10,00%	6,38%	11,22%
	Missed channel	0,00%	0,00%	2,13%	10,20%
	Total	27,78%	10,00%	27,66%	50,00%

In relation to all registered cases of mistakes as a result of endodontic manipulations, 4.63% of them were cases of endodontic treatment of mandibular incisors, 2.57% - cases of endodontic treatment of mandibular canines, 12.08% - cases of endodontic treatment of premolars mandible and another 25.19% - for cases of endodontic treatment of mandibular molars. The prevalence of certain types of complications in the treatment of premolars and molars of the mandible statistically exceeded the prevalence of such in the treatment of incisors and canines of the mandible ($p < 0.05$), in particular in relation to the total number of complications 3.34% and 4.37% were cases inhomogeneous obstruction of premolars and molars, respectively, 3.08% and 4.37% - for cases of underobturation of the endospace to the level of apical narrowing, 2.31% and 3.86% - for cases of extrusion of filling material into the apical space, 1.03% and 2.57% - for cases of endodontic space expansion, 0.51% and 2.31% - for cases of separation of endodontic instruments, 0.77% and 2.31% - for cases of perforation of the canal wall, 0.77% and 2, 83% - for cases of apex transposition, 0.26% and 2.57% - for cases of missed canal, respectively. Although taking into account the peculiarities of the distribution of cases of different types of complications in the analysis of different groups of teeth (during subgroup analysis), the prevalence of such in the form of extrusion of filling material into the apical space, perforation of the wall and transposition of the apex during treatment of incisors and canines was observed more often than were noted in the subgroup analysis of premolars and molars (table 2).

Table 2.
Distribution of different types of errors in endodontic treatment of mandibular teeth (in relation to the total number of registered)

Types of teeth / Types of errors		Cutters	Canines	Premolars	Molars
At the stage of obturation	Inhomogeneous obturation	1,03%	0,51%	3,34%	4,37%
	Underburdening	1,03%	0,51%	3,08%	4,37%
	Extrusion of filling material	1,29%	1,29%	2,31%	3,86%
	Total	3,34%	2,31%	8,74%	12,60%
At the stage of mechanical and medical processing	Expansion of the endodontic space	0,00%	0,00%	1,03%	2,57%
	Separation of the tool	0,00%	0,00%	0,51%	2,31%
	Perforation	0,77%	0,00%	0,77%	2,31%
	Transposition of the apex	0,51%	0,26%	0,77%	2,83%
	Missed channel	0,00%	0,00%	0,26%	2,57%
	Total	4,63%	2,57%	12,08%	25,19%

Differences in the distribution of prevalence of different types of complications in the treatment of different groups of teeth can be attributed to different baseline radiographs of the respective teeth in the initial set of radiographs, as well as differences in the probability of including the appropriate number of radiographs in a randomized sample based on their distribution in the structure of the general population. Although the principle of random formation of the studied sample of radiographs in the amount equal to the minimum required to ensure proper representation contributed to the objectification of the results and their maximum approximation to the actual distribution of cases of registered mistakes during endodontic treatment in the primary population at different stages of intervention.

Conclusions. Thus, analyzing the results obtained by us during the study, it becomes clear that the largest number of mistakes and complications are registered in the treatment of masticatory teeth: premolars and molars (8.74%, 12.60%, respectively), and the lowest percentage of complications - when treatment of incisors (3.34%) and canines (2.31%) is conducted. The main error rate is observed at the stage of mechanical and medical treatment of molar root canals - 25.19%, and the lowest rate in the treatment of canines - 2.57%.

Therefore, the obtained results are of important diagnostic value, as they will help the endodontist to pay more attention when performing endodontic manipulations at certain stages of intervention, taking into account the obtained statistical indicators, which will have a positive impact on the effectiveness and success of iatrogenic intervention.

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ANALYSIS OF THE RESULTS OF THE QUESTIONNAIRE OF MEDICAL STUDENTS ABOUT THE CORONAVIRUS INFECTION

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Annotation. The relevance of the epidemiology of COVID-19 is not in doubt, as every day the statistics are updated with new data on the incidence. Students are in distance learning to prevent the spread of infection.

The aim of our work was to determine the percentage of medical students who contracted a coronavirus infection during the last academic year, to determine the risk factors and COVID-19 features in an outpatient setting.

The survey was attended by second and third year students of the medical faculty of I. Horbachevsky Ternopil National Medical University (TNMU), a total of 66 questionnaires were received, which were processed using the Google form. The results were processed according to the general rules of variation statistics.

The survey was attended by students aged 18 to 21 years, among whom women predominated, accounting for 69.7%, respectively, men accounted for 30.3%. The course of coronavirus infection in 86.4% respondents were mild because they were on outpatient treatment and only 3 people (13.6%) – moderate. Duration of clinical symptoms ranged from 5 days (18.2%) to two weeks - 31.8%. The leading symptoms were fever, loss of smell and taste, headache and general fatigue. most often noted an increase in temperature – 16 (72.3%), loss of sense of smell and taste - 12 (54.5%), headache and general fatigue were much less common - 7 (31.8%) cases, there were complaints of sore throat and chest. In 22.7% of students, muscle pain bothered 18.1% of people. In 9.0% of respondents, laboratory-confirmed coronavirus infection was asymptomatic.

As a result of the study, it was found that 33.3% of second-third year students relapsed to COVID-19, the maximum number of cases occurred in the fall of 2020 (45.5%) and in January-February 2021 - 27.2%. Due to the continuation of distance learning at many medical universities, the risk of infection during close contact with classmates is small, and anti-epidemiological measures aimed at reducing infection play a positive role.

Key words: medical students, questionnaire, COVID-19, course, symptoms, distance learning.

Introduction. According to the Center for Public Health, as of February 20, 2021, there were 6,295 new confirmed cases of COVID-19 coronavirus disease in Ukraine (including 429 children and 223 health workers). The number of active patients is 130,406. In all higher education institutions, the spread of viruses, namely the SARS-CoV-2 virus, and other pathogens is quite rapid, due to indoor work and students living on campuses on the territory of educational institutions. [6, 4].

Based on these circumstances, the resolution of the Chief State Sanitary Doctor of Ukraine dated 22.08.2020 № 50 approved the order “Anti-epidemic measures in educational institutions for the period of quarantine in connection with the spread of coronavirus disease.” Under quarantine conditions, teachers of medical universities conduct conversations with students about educational and explanatory measures on the spread of respiratory diseases, namely conversations, seminars, webinars on social networks.

SARS-CoV-2 virus has been shown to have extremely high tropism to the transmembrane cellular receptor, the ACE2 protein, which occupies up to 25% of the cell membrane structure of epithelial cells, primarily alveolar. Age differences in the presence and concentration of this protein on the cell surface are quite large, it was found that its concentration is minimal in young children and gradually increases, reaching a maximum in older age - 14-19 years.

This probably explains the low incidence of children, and in the case of the disease, it usually has a mild uncomplicated course and more severe course in the elderly [4]. Extremely many literature sources indicate that the severity of coronavirus infection increases with age. However, the changes that occur in patients on outpatient treatment are insufficiently studied [3,4].

The aim of our study was to determine by remote online questionnaire of students whether they had coronavirus infection during the quarantine period, to analyze the severity and clinical symptoms of COVID-19 in outpatient medical students when they were in distance learning in period from February 2020 to February 2021.

Materials and methods. Second and third year students of I. Horbachevsky Ternopil National Medical University (TNMU) took part in the survey, a total of 66 questionnaires were received, which were processed using the Google form.

They were asked to answer the following questions:

- Did you suffer from COVID-19 between February 2020 and February 2021 (diagnosis must be confirmed by PCR or ELISA)?
- If you were ill, please indicate in which month, how many days did the illness last, were you treated on an outpatient basis or in a hospital?
- Have you been tested for antibodies to COVID-19 after suffering from the disease?
- Did your close relatives with whom you live suffer from COVID-19?

Also, the questionnaire included questions about the severity of coronavirus infection and the leading symptoms that occurred during the disease, and the list of the latter was not specified in the questionnaire, but gave respondents the opportunity to indicate the symptoms they had.

When choosing the questions for the questionnaire, we were guided by the principles of anonymity and data on the occurrence and course of coronavirus infection in young

people. The results of the study were processed according to the general rules of variation statistics, using a package of licensed application program Microsoft Excel (Microsoft Office 2010).

Results and discussion. The survey was attended by students aged 18 to 21 years, among whom women predominated, accounting for 69.7%, respectively, men accounted for 30.3%. Such indicators may be determined by a sample of respondents who took part in the survey and sent their questionnaires. Among students who relapsed with coronavirus infection were 22 people (33.3%). Among sick patients there were twice as many as boys (15 - 68.2% and 31.8%). When comparing the results with the data of the Center for Public Health, discrepancies were found, which indicate the absence of gender differences in the occurrence of COVID-19 [1, 3, 5]. The course of coronavirus infection in 86.4% of respondents was mild, they were in outpatient treatment and only 3 people (13.6%) - moderate.

In all respondents who relapsed to COVID-19, the diagnosis was confirmed by PCR (polymerase chain reaction). The duration of clinical symptoms varied from 5 days (18.2%) to two weeks - 31.8%. However, mostly recovery occurred within 7-10 days (50.0%) (Figure 1).

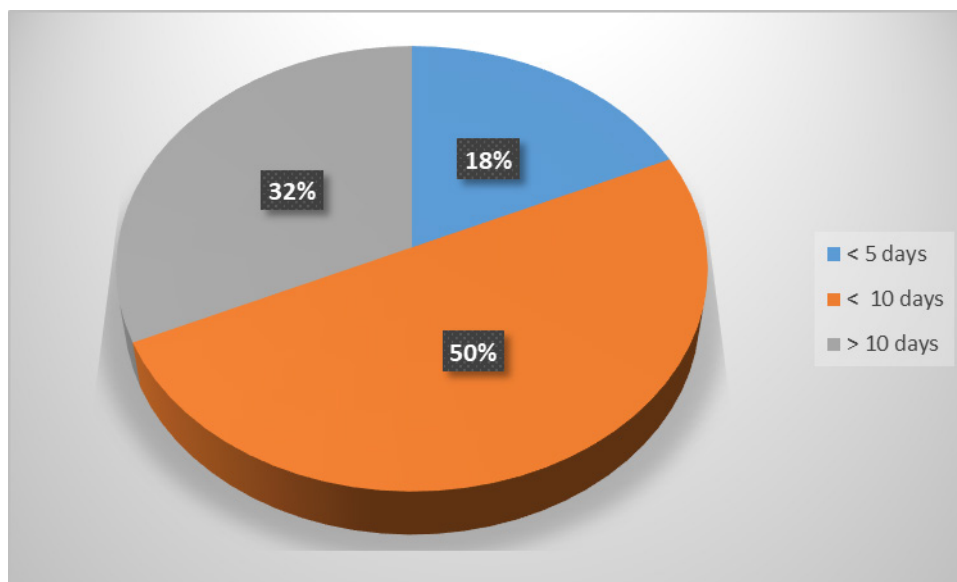


Fig. 1. *Distribution of respondents by disease duration in days*

The study for the presence of antibodies after the disease was conducted in about half of the respondents - 45.5%.

Clinical symptoms of the disease, according to the WHO, are most often noted: fever, weakness and dry cough, pain when swallowing, sneezing; rhinitis; headache; manifestations of hypoxia; muscle pain. The main clinical criteria for COVID-19 are cough and shortness of breath or difficulty breathing. Also, fever, chills, tremors, muscle aches, and a feeling of brokenness throughout the body are common. In some patients, loss of smell and taste (anosmia and dysgeusia) is possible [3,5].

In addition, patients may complain of nasal congestion or rhinorrhea, conjunctivitis, gastrointestinal disorders - loss of appetite, occasionally nausea, vomiting, diarrhea.

Other symptoms include sore throat, chest pain, disorientation, dizziness, headache, hemoptysis, and skin manifestations. Most people (80%) do not have these symptoms, or they are mild and do not require treatment, but require diagnosis and application of anti-epidemic measures [1].

However, the differential diagnosis of coronavirus infection is not possible solely on the basis of clinical symptoms.

Our respondents most often noted an increase in temperature - 16 (72.3%), loss of smell and taste - 12 (54.5%). Headache and general fatigue were much less common - in 7 (31.8%) cases. 22.7% of students with COVID-19 complained of sore throat and chest pain. Muscle pain bothered 18.1% of people, with the same frequency of respondents noted the presence of cough (Figure 2).

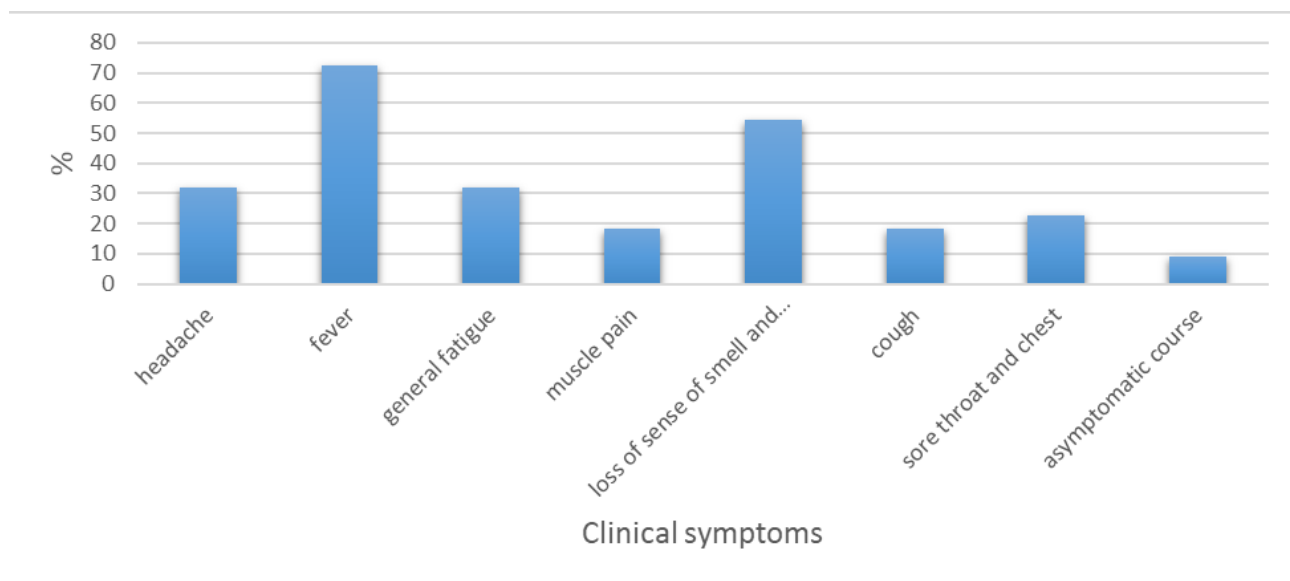


Fig. 2 Clinical symptoms of COVID-19 in medical students

In 2 students (9.0%) the laboratory confirmed diagnosis of coronavirus infection was asymptomatic. According to scientific data, it is difficult to estimate the prevalence of asymptomatic cases in the population, but in China, asymptomatic infection was reported at 12.6% of cases [2].

A slightly lower percentage of asymptomatic medical students may be due to a certain alertness to the development of coronavirus infection and a more careful attitude to their health. Associate the occurrence of the disease with the disease of close relatives of 10 (45.5%) respondents, in the rest of the family, cases of coronavirus infection are not noted that confirms the high risk of infection in non-compliance with the rules of quarantine and self-isolation during a pandemic.

Conclusions. Thus, the study gives grounds to state the following:

- every third medical student of the II-III course (33.3%) who were in distance learning in the period from February 2020 to February 2021 relapsed into coronavirus infection;
- the maximum number of cases occurred in the fall of 2020 (45.5%) and in January-February 2021 - 27.2%; in half of the respondents the disease was mild and lasted up to 10 days; 86.4% - were treated on an outpatient basis;

- research on the presence of antibodies after the disease was conducted in about half of the respondents - 45.5%;
- The leading symptoms noted by medical students who became ill were fever, loss of smell and taste, headache and general fatigue.
- In 9.0% of respondents, laboratory-confirmed coronavirus infection was asymptomatic;
- 45.5% of respondents associate the occurrence of the disease with the disease of close relatives.

Due to the continued training in many medical universities in the distance mode, the risk of infection during close contact with classmates is small, and against epidemiological measures aimed at reducing infection, play a positive role.

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SOMATOMETRIC AND BIOCHEMICAL STUDIES IN COMPLEX ASSESSMENT OF NUTRITIONAL SATUS IN CHRONIC INFLAMMATORY BOWEL DISEASE

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Resume. Actuality. Worldwide, there is a rapid increase in the incidence of chronic inflammatory bowel disease (IBD), especially in young, able-bodied populations, which draws the attention of scientists around the world to this problem. Indeed, the main forms of IBD: Crohn's disease (CD) and nonspecific ulcerative colitis (UC) are understudied inflammatory diseases that cause progressive gastrointestinal damage, have a recurrent course and require almost constant treatment, which in turn inevitably leads to patient's nutritional status violation[1,2]. Unfortunately, today there is no single algorithm for detecting these disorders and their changes often remain undetected. That is why the detection and correction of nutritional status disorders in the initial stages will provide an opportunity to optimize the treatment of these patients, which will facilitate the course of the underlying disease and improve its prognosis. [3]

The aim of the study. To evaluate and identify features of changes in nutritional status of patients with IBD using anthropometric, laboratory and supporting research methods (questionnaire Nutritional Risk Screening NRS-2002).

Materials and methods. We examined 100 patients with IBD, aged 19 to 79 years, on average (42.54 ± 1.5) years, including 70 patients with UC, 30 - with CD. All patients underwent: general clinical examination, anthropometric measurements, general and biochemical blood tests (with determination of total protein, albumin, prealbumin), determination of retinol-binding protein levels by ELISA, and the questionnaire "Nutritional risk screening" (NRS) - 2002).

Results. BMI deficiency was more common in patients with CD (36.6%) than in UC (12.9%). In the analysis of anthropometric indicators, nutritional insufficiency (NI) was detected in 28.6% of patients with UC and in 53.3% of patients with CD. When determining the degree of NI it was found that severe insufficiency is characteristic only of patients

with CD (6.7%). Total protein and albumin levels showed a significant difference between severity of NI ($p < 0.05$) in both nosological groups. There was a significant difference in the levels of RBP between nosological forms in the general group: the average level of RBP in patients with UC was 20.61 ± 11.63 , while in patients with CD - 12.68 ± 8.02 ($p < 0.004$). A direct correlation was found between the level of RBP and BMI ($r = 0.53$) in the general group. In the analysis of NRS 2002 data, 52.9% of patients with UC and 100% of patients with CD were at risk of developing or pre-existing malnutrition.

Conclusions. Involvement in the comprehensive assessment of the nutritional status of the NRS 2002 questionnaire and the use of protein metabolism indicators will allow more thorough detection of nutritional status violations at the initial stages, when anthropometric indicators do not yet reflect the true picture of changes or are influenced by other factors.

Key words: nutritional status, nonspecific ulcerative colitis, Crohn 's disease, anthropometry, retinol - binding protein, prealbumin, NRS - 2002.

It is known that proper nutrition has a great influence on the body's vital functions and is an important factor in ensuring resistance to pathological processes of various origins. According to the results of numerous studies, up to 50% of inpatients already have severe eating disorders, which significantly affects the course of the underlying disease and worsens its prognosis.

Globally, there is a rapid increase in the incidence of chronic inflammatory bowel disease (IBD) in the newly industrialized countries, especially among young people of working age [4]. Historically, IBD has been associated with malnutrition and underweight [5]. Indeed, the main forms of IBD, Crohn's disease (CD) and nonspecific ulcerative colitis (UC) are understudied inflammatory disorders and cause progressive gastrointestinal damage leading to eating disorders and underweight [6]. Moreover, the available data indicate that about 65-75% of patients with CD and UC (18-62%) are underweight [7].

It is the inflammatory condition that can lead to the deterioration of the nutritional status of patients with IBD. Malnutrition is a major complication among these patients and is highly associated with the worst prognostic and increased risks of clinical and surgical complications. The main factors in the deterioration of nutritional status in these patients are insufficient food intake, chronic inflammatory condition with increased energy needs and loss of the gastrointestinal tract (frequent bowel movements, chronic blood loss, decreased absorption surface of the mucous membrane due to inflammation or resection etc). On the other hand, the prevalence of overweight and obesity among these patients is increasing, especially in recent decades. Dietary changes have been identified as one of the factors causing cardiovascular disease, and therefore this population needs careful dietary monitoring to identify patients at risk for nutritional risk in advance [8].

For the above reasons, nutritional status assessment is a key point for the management of patients with IBD, namely for the detection and timely correction of metabolic disorders and, as a consequence, to avoid complications and improve the prognosis for these patients.

Somatometric and clinical-laboratory parameters are used in everyday clinical practice to assess the nutritional status of the patient. Mandatory parameters include data from anthropometric, clinical and laboratory studies. These parameters can and should be used by a doctor of any specialty to determine the current nutritional status [9].

Anthropometric (somatometric) parameters, the measurement of which is formally mandatory during the physical examination of the patient, include: height and weight and their derivatives (body weight, height, body mass index), mid-arm circumference, triceps skinfold thickness.

Laboratory methods of nutritional status assessment necessarily include indicators of protein metabolism (total blood protein, blood albumin, daily urine creatinine, urea of daily urine, etc.), and characterize primarily the visceral pool of protein, which is closely related to the state of protein-synthetic liver function, hematopoietic organs and immunity.

Currently, there are more sensitive methods for assessing the visceral protein pool. Transthyretin (TTP; prealbumin) and retinol-binding protein with half-lives of 2 days and 12 hours, respectively, are most sensitive. The short lifespan of prealbumin and retinol-binding protein, the small proportion of their pool in the extravascular space, and the rate of synthesis in the liver allow us to recommend these transport proteins for early diagnosis of protein deficiency. [10]

It is clear that the use of any one anthropometric or laboratory indicator will not be an objective reflection of the nutritional status of the patient. In addition, in practice, with a known time limit, the ability to quickly (bed-side, near the patient's bed) and preferably a simple assessment of nutritional status. In this regard, integrated evaluation systems have been actively introduced into clinical practice, which allow a combination of several parameters to determine the current nutritional status of the patient. The European Society of Clinical Nutrition and Metabolism (ESPEN) recommends the use of the Nutritional Risk Screening (NRS) system to assess the nutritional status of patients. [11, 12].

Unfortunately, today there is no single algorithm for detecting and assessing the nutritional status of this category of patients, and therefore **the purpose of our study** is to assess and identify changes in the nutritional status of patients with IBD using anthropometric, laboratory and auxiliary research methods (Nutritional Risk Screening NRS-2002).

Materials and methods: We examined 100 patients with IBD, aged 19 to 79 years, on average (42.54 ± 1.5) years, including 70 patients with UC, 30 - with CD. In 44 cases with NEC and in 18 with HC there was a moderate severity of the disease, in 26 patients with UC and in 12 cases with CD - severe disease. The inclusion of patients in the study was carried out regardless of the presence or absence of external signs of nutritional status. All patients underwent a general clinical examination to determine anthropometric parameters. Body mass index (BMI) was calculated by the formula:

$$BMI = \frac{m}{h^2},$$

where: m – body weight in kilograms; h – height in meters.

BMI was assessed according to WHO recommendations (1997) [13]. Triceps Skinfold Thickness (TSF) was measured in millimeters with a caliper. Mid-arm Circumference (MAC) was measured in centimeters at the level of the middle third (midway between the tip of the acromial process of the scapula and the ulnar process of the ulna) of the non-working, unstressed hand. The Mid-Arm Muscle Circumference (MAMC) was calculated by the formula:

$$\text{MAMC} = \text{MAC} - 3,14 \times \text{TSF}$$

Assessment of the degree of nutritional insufficiency (NI) by anthropometric parameters was performed taking into account the values given in the table of anthropometric (somatometric) indicators of malnutrition (according to AV Pugaev and EE Achkasov, 2007)[14]. The patients also underwent general and biochemical blood tests (determination of total protein, albumin, prealbumin), determination of retinol-binding protein levels by ELISA (Elabscience Human RBP4 (Retinol Binding Protein 4) ELISA Kit). All patients underwent a questionnaire with the help of which consists of 3 blocks: 1-initial assessment (BMI, probable weight loss, malnutrition, patient's condition (severity), 2- nutritional status and severity of the disease (more detailed consideration of weight loss conditions and degree 3- degree of nutritional insufficiency (assessment of laboratory parameters: albumin, total protein, lymphocytes, body weight deficiency, BMI). The totality of the first two blocks determined the predisposition to development or an indication of the already existing malnutrition, to the third block passed when the sum of points for the first two was 3 or more.

Statistical analysis of the results was performed using Excel Microsoft Office 2010 and SPSS 9.0 for Windows. Comparison of the mean values of the variables was performed using the Mann-Whitney U-test. The statistical significance of the difference was estimated to be at least 95.0% (probability of error $p < 0.05$).

Results and discussion.

Determination of BMI in the studied patients showed that the average BMI was (20.22 ± 0.32) in patients with CD and (23.32 ± 0.48) in patients with UC. In most of the examined patients, the BMI did not exceed the norm. BMI deficiency was more common in patients with CD (36.6%) than in UC (12.9%) (Fig. 1).

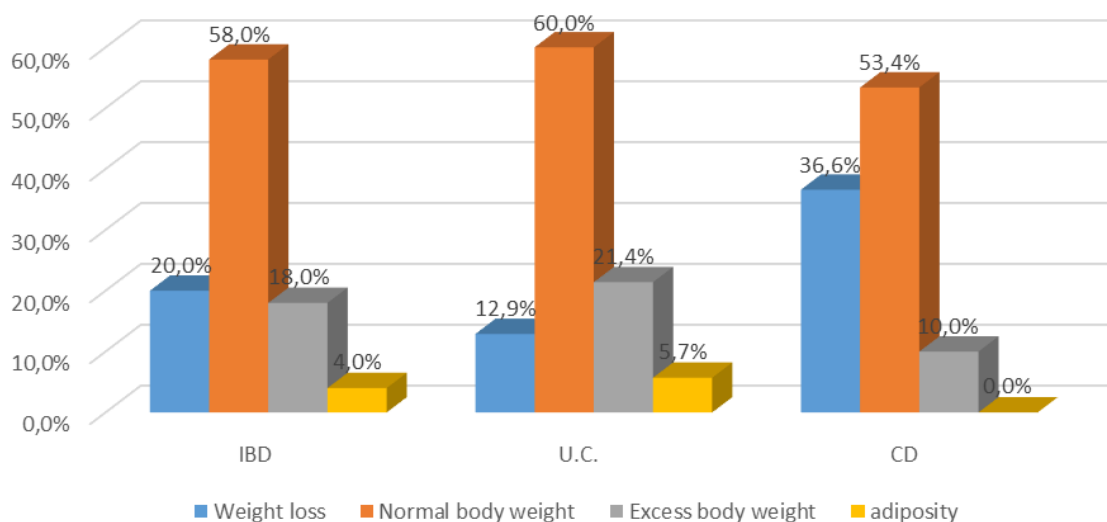


Fig. 1. Distribution of patients by BMI

In the analysis of anthropometric indicators (TSF, MAC, MACM) nutritional insufficiency was found in 28.6% of patients with UC and 53.3% of patients with CD.

Patients with CD were characterized by a more pronounced decrease in the TSF and MACM than in patients with UC ($p < 0.05$), which may indicate protein deficiency. (Table 1)

Table 1.
Anthropometric indicators depending on the nosology $M \pm m$

Indicator	IBD (n=100)	UC (n=70)	CD (n=30)
CS (sm)	25,99±0,37	26,6±0,43	24,2±0,6
TSF (sm)	0,9±0,02	0,9±0,02	0,77±0,03*
CSM (sm)	23,0±0,33	23,6±0,39	21,8±0,5**

* Note. *, ** - $p < 0,05$ - significance of differences with the UC group.

When determining the degree of nutritional insufficiency (NI) it was found that 64% of the total number of patients did not have nutritional insufficiency, while the nosological form of more than half of patients with CD suffer from nutritional insufficiency of varying degrees, and in patients with UC this condition is only 28.6 % of patients. Also, it is important to note that severe form of insufficiency is characteristic only of patients with CD (6.7%) (Fig. 2).

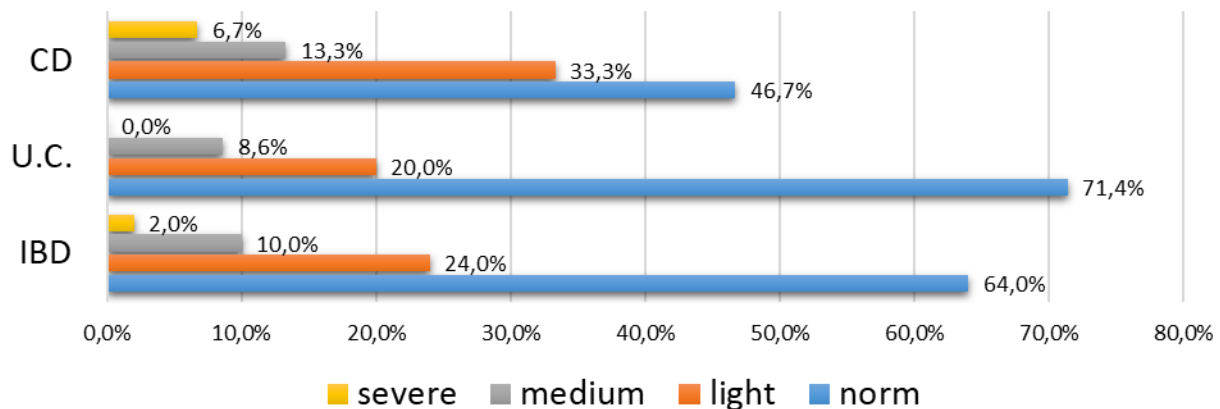


Fig. 2. *Distribution of patients by the degree of nutritional insufficiency by anthropometric indicators.*

In addition, we assessed the levels of major protein pools and short-lived transport proteins in blood plasma (prealbumin and retinol-binding protein (RBP)). Statistical analysis revealed a significant difference between prealbumin levels in groups of mild and moderate nutritional deficiency only in patients with UC (table 3), so it is advisable to use it only to determine the severity of NI in this category of patients, while total protein and albumin showed significant difference depending on the severity of NI in

both nosological groups (tab.3,4). There was also a significant difference in the levels of RBP between nosological forms in the general group: the average level of RBP in patients with UC was 20.61 ± 11.63 , while in patients with CD - 12.68 ± 8.02 ($p < 0.004$). This proves that the decrease in RBP levels is more characteristic of patients with Crohn's disease, and may be due to the involvement of the small intestine in the pathological process and disruption of absorption processes, as RBP responds immediately to changes in protein intake. Correlation analysis revealed a direct correlation between the level of RBP and BMI ($r = 0.53$).

Table 2.
Indicators of protein pools in the group of CD

CD	normal	light	medium	severe
Total protein (g / l)	$68,61 \pm 8,4$ *,**	$65,7 \pm 10,4$	$58,8 \pm 5,8$	$54 \pm 4,2$
albumin (g / l)	$38,83 \pm 7,5$ #,##	$30,35 \pm 2,8$	$30,18 \pm 3,3$	$27,6 \pm 1,4$
prealbumin (g / l)	$0,25 \pm 0,09$	$0,29 \pm 0,08$	$0,25 \pm 0,09$	$0,28 \pm 0,06$
RBP (ng / ml)	$15,15 \pm 11,8$	$12,08 \pm 4,5$	$9,27 \pm 1,3$	$9,4 \pm 1,0$

Note: * - $p < 0,05$ -- significance of differences between groups with normal and average NI degree
 ** - $p < 0,05$ -- significance of differences between groups with normal and severe NI
 # - $p < 0,05$ -- significance of differences between groups with normal and mild NI
 ## - $p < 0,05$ -- significance of differences between groups with normal and average degree of NI

Table 3.
Indicators of protein pools in the UC group

UC	normal	light	medium
Total protein (g / l)	$70,64 \pm 7,7^*$	$63,85 \pm 6,6$	$67,16 \pm 8,9$
albumin (g / l)	$41,92 \pm 9,5^{**,#}$	$34,77 \pm 6,0$	$32,4 \pm 2,8$
prealbumin (g / l)	$0,28 \pm 0,07^{##}$	$0,24 \pm 0,06$	$0,33 \pm 0,04$
RBP (ng / ml)	$21,92 \pm 14,4$	$18,9 \pm 5,09$	$18,28 \pm 5,7$

- $p < 0,05$ - significance of differences between groups with normal and average NI
 ## - $p < 0,05$ - significance of differences between groups with mild and moderate NI

However, due to the fact that anthropometric indicators can give an incorrect picture of the state of emergency due to the influence of external factors (skeletal muscle atrophy due to age or hypodynamics, water-electrolyte imbalance, with developed muscles in athletes, etc.), in our study, we included the NRS 2002 questionnaire in a comprehensive assessment.

In the analysis of NRS 2002 data (Fig. 3), 52.9% of patients with UC and 100% of patients with CD already had a risk of developing or existing malnutrition, which indicated the need for correction of therapy and the appointment of nutritional support.

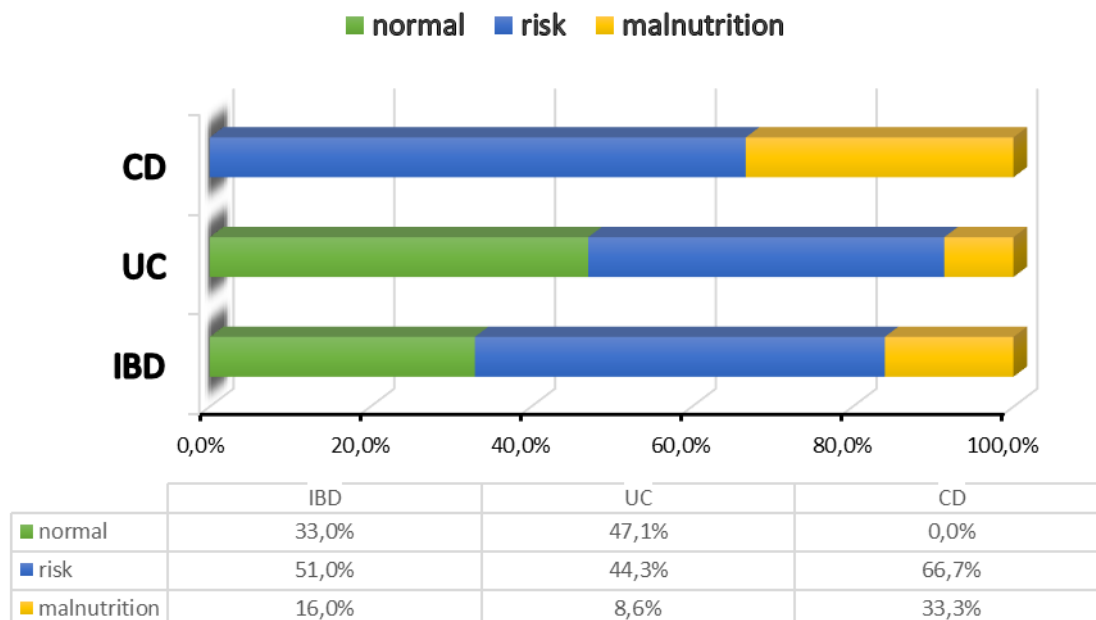


Fig. 3. Determination of nutritional risk according to the results of NRS 2002

Conclusions: All patients with IBD have changes in nutritional status, but patients with CD are more prone to develop nutritional insufficiency. A more detailed assessment of somatometric parameters allows more careful detection of nutritional deficiencies. Total protein and albumin showed a significant difference between the severity groups of NI, so it is advisable to include them in the routine practice of clinicians in assessing the nutritional status of the patient. Prealbumin levels should be used in patients with UC to determine the severity of NI, and the level of RBP, which immediately reacts negatively to changes in protein intake due to impaired absorption in the small intestine, is more common in patients with CD. Involvement in the comprehensive assessment of the nutritional status of the NRS 2002 questionnaire and the use of protein metabolism indicators will allow more thorough detection of nutritional status violations at the initial stages, when anthropometric indicators do not yet reflect the true picture of changes or are influenced by other factors. This will make it possible to optimize personalized treatment for each individual patient, taking into account his nutritional status.

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HISTORY OF ESTABLISHMENT AND DEVELOPMENT OF ADMINISTRATIVE AND LEGAL SUPPORT OF STATE SOCIAL POLICY

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Annotation. The article considers the history of formation and development of state social policy. It was found that the social policy in Ukraine, as an independent sovereign state, was initiated with the proclamation of the Declaration of State Sovereignty of Ukraine. The formation of state social policy has been going on for a long time - from unorganized events to modern systems at the state level. It is stated that the first attempts to outline the directions of the state policy of Ukraine for the near future are reflected in the resolution of the Verkhovna Rada of Ukraine "On the main directions of the economic policy of Ukraine in the conditions of independence". The normative basis for the formation of the basic principles of state social policy and the activities of public authorities was the Constitution of Ukraine. It is determined that at the beginning of Ukraine's independence the issues of state social policy were considered in the context of economic development of the state, preference was given to certain sectors of the economy. The main normative-legal acts and programs that regulate the activity in this direction are analyzed. It is theoretically substantiated that the administrative and legal legislation in this area was not of good quality, which is one of the main reasons for the ineffectiveness of many program documents that defined the state social policy. The main shortcomings of the regulatory and legal support of state social policy are highlighted. It is stated that the state social policy in the period from 2014 to the present is characterized by a departure from centralization to regionalization of social policy, a departure from the post-Soviet model and the construction of its measures in accordance with European standards. The opinion is substantiated that the history of formation of the state social policy is connected with awareness of responsibility of the state and society for well-being of each person.

Key words: administrative and legal support, formation and development, state social policy, strategic goals, social stability.

Formulation of the problem. Social policy in Ukraine, as an independent sovereign state, was initiated with the proclamation of the Declaration of State Sovereignty of Ukraine. The Declaration states that a person, his honor, health - the highest value for society, the goal of its development. This means that in modern Ukraine, the economy and politics must have an appropriate social orientation, and appropriate conditions must be created in the state for cooperation of all structures of the political system, all parts of society in their unity, even with their objective differences. And so we need a certain socially oriented activities of public authorities, public associations, local governments for social protection and provision, support of the population [1].

The formation of state social policy has been going on for a long time - from unorganized events to modern systems at the state level. Since Ukraine's independence, the understanding of ensuring social stability and taking into account the interests of various segments of the population has received the attention of the then authorities. Along with this, the issue of state social policy of Ukraine, as a separate and important direction of the state, was not considered. In view of this, it is important to consider the history of formation and development of state social policy through the prism of its administrative and legal support.

Analysis of recent research and publications. A significant number of works by both domestic and foreign jurists are devoted to the formation and development of social policy, including: V. Bazylevych, A. Biltsan, T. Denysenko, I. Evdokimova, E. Libanova, O. Novikova, V. Skuratovsky, A. Khaletska, G. Yurchyk and others. However, despite the availability of scientific achievements in this area, the study of the history of formation and development of state social policy requires deepening in the evolution of social policy in various historical forms of public life, as well as analysis of its administrative and legal support.

The purpose of the article is to determine the features of the formation and development of administrative and legal support of social policy in Ukraine.

The methods of scientific research. Are the historical method by which the scientific analysis of the formation and development of administrative and legal support of state social policy, formal-dogmatic and comparative-legal, which allowed to explore the features of legislation in the period of genesis and their comparative analysis.

Results of the research. Socially oriented activity in one form or another was present in all historical forms of organization of public life. In the history of mankind there have never been social formations in which one way or another would not solve social problems, would not take into account the interests of citizens or, to use modern terminology, would not pursue any social policy [2].

The first attempts to outline the directions of state policy of Ukraine in the near future are reflected in the resolution of the Verkhovna Rada of Ukraine "On the main directions of economic policy of Ukraine in the conditions of independence" [3]. Social policy is not discussed in this resolution, however, one of the priorities of economic policy of the state is the social protection of the population [3].

Significant changes in the main directions of economic policy of Ukraine were made on 09.02.1993 by the resolution of the Verkhovna Rada of Ukraine "On the main directions of economic policy of Ukraine in the conditions of independence" [4]. The introduction of these changes was expected, because it is quite natural that a significant adjustment of certain provisions of the economic policy of the state was needed. In this resolution, the priorities of social policy have not changed.

As we can see, at the beginning of Ukraine's independence, issues of state social policy were considered in the context of economic development of the state, preference was given to certain sectors of the economy.

In October 1994, the President of Ukraine published an appeal to the Verkhovna Rada entitled "Through Radical Economic Reforms." After hearing and discussing the report of the President of Ukraine "On the Basic Principles of Economic and Social Policy", the Verkhovna Rada of Ukraine supported its main provisions. In this document, the social policy of the state was considered as a separate area. In addition, this document proposes changes, according to which social policy should be: first, adequate to the state

of the economy; second, to help overcome the crisis; thirdly, to ensure the satisfaction of the minimum necessary living standards of the population [5]. The resolution provided for 11 areas of state social policy, some of which are relevant today (preservation and reproduction of labor potential of the people, overcoming poverty, regionalization of state social policy).

In May 1993, the Ministry of Labor presented the "Concept of Social Security of the Population of Ukraine" at the national conference "Social Protection of the Population of Ukraine in the Conditions of Economic Reforms". In April 1993, it was revised and approved by the Verkhovna Rada on December 21, 1993 [6; 7, p. 28].

Thus, in the first half of the 90s of the twentieth century. in Ukraine there was no clear vision of the ultimate and strategic goals of society. In view of this, there is a need to rethink the guidelines for the formation of economic and social policy of the state [8].

The normative basis for the formation of the basic principles of state social policy and the activities of public authorities in this area was the Constitution of Ukraine of 1996, according to which Ukraine is a sovereign and independent, democratic, social, legal state (Article 1); citizens have the right to social protection, which includes the right to provide them in case of complete, partial or temporary disability, loss of breadwinner, unemployment due to circumstances beyond their control, as well as in old age and in other cases provided by law (Article 46) [9].

However, the long decline in production made it impossible to achieve significant changes in the social and economic development of the country. During the first decade of Ukraine's independence, there were significant changes in the level of real incomes. Society is divided into two very opposite strata - high-income population (almost 10-12%) and low-income population living on the edge of poverty or below it (more than 80%) [8].

In 1997, the President of Ukraine issued a Decree "On the main directions of social policy for 1997-2000", which defined the priorities, the main directions of social policy in accordance with the real socio-economic condition of the state, gradual, gradual implementation of social policy depending on economic and political reforms [10]. This document defined the main strategic goals of social policy at the state and regional levels.

The next document that was adopted at that time was the Strategy of Ukraine's integration into the European Union (1998), which identified the main areas of cooperation between our country and the EU [11], which focuses on the adaptation of Ukraine's social policy, which includes reforming systems insurance, labor protection, health, pension provision, employment policy in accordance with EU standards and the gradual achievement of the European level of social security and protection of the population [12, p. 127].

In 1999, the Law of Ukraine "On the Subsistence Minimum" was adopted. This Law, in accordance with Art. 46 of the Constitution of Ukraine, defined the subsistence level, laid the legal basis for its establishment, approval and consideration in the implementation of the state constitutional guarantee of citizens to a sufficient standard of living [6; 7, p. 28].

Thus, during the first 10 years of independence and constant unsystematic reforms, there was a sharp decline in living standards in Ukraine. The basis of these errors was the lack of scientific justification for the social aspects of economic reforms and relevant social institutions [8]. In view of this, it can be stated that the reforms carried out during these years were ineffective, which, as a consequence, contributed to lower living standards and deepened the social crisis, although in the late twentieth century. nevertheless, it

was possible to more or less stop the negative phenomena in the economy and stabilize the situation in the social sphere.

The beginning of the next period of formation and development of state social policy in Ukraine should be associated with the Decree of the President of Ukraine "On the main directions of social policy for the period up to 2004" from 24.05.2000 [13].

The years 2004-2008 are characterized by the development, approval and implementation of various program documents in various social spheres (Concept of development of public health of Ukraine, Concept of further reform of wages in Ukraine, Strategy of demographic development until 2015, etc.). During this period, regional program documents for the development of certain social sectors within the administrative-territorial unit (State Strategy for Regional Development for the period of 2015) are being adopted. However, the basic document should still be considered the Strategy of Economic and Social Development of Ukraine "Through European Integration" [14].

In 2003, the Law of Ukraine was adopted: "On Social Services", which initiated the reorientation of the post-Soviet practice of non-transparent various benefits and inefficient social benefits to build a European model of social protection, the central place in which is given to social services; "On Compulsory State Pension Insurance", which defined the three-tier structure of the national pension system; "On the collection and accounting of a single contribution to the obligatory state social insurance", which improved the administrative and legal regulation of the collection and accounting of a single contribution.

Thus, in this period of time in Ukraine, the state has already begun to pay attention to the elimination of problems in the social sphere, clearly aware of the existing problems that needed to be addressed. A positive aspect of state social policy was the government's efforts to improve the quality of life.

An important step towards building a socially oriented economy is the entry into force on October 1, 2011 of the Law of Ukraine "On Measures to Legislatively Reform the Pension System", which provides for balancing the solidarity pension insurance system and creating conditions for the introduction of the second tier pension insurance, as well as raising the retirement age to 60 for women until 2021 and insurance experience of 10 years for both women (from 20 to 30 years) and for men (from 25 to 35 years), resulting in a decrease in state pension expenditures in GDP by 1.7%.

On July 21, 2006, the Cabinet of Ministers of Ukraine adopted a resolution "On approval of the State Strategy for Regional Development for the period up to 2015". This document defined the directions of state regional development of social policy.

Directions of development of social spheres are reflected in state strategic and program documents, such as the Strategy of Sustainable Development "Ukraine-2020", the State Strategy of Regional Development until 2020, the Strategy of Public Administration Reform of Ukraine for 2016-2020.

In 2017, Ukraine began to reform the health care system, during 2017-2018 there were a number of systemic changes in the field of health care informatization, in particular, the Law of Ukraine "On state financial guarantees of medical care" was adopted.

Thus, the state social policy in the period from 2014 to the present is characterized by a departure from centralization to regionalization of social policy, a departure from the post-Soviet model and the construction of its measures in accordance with European standards.

Conclusions. In conclusion, we note that the history of the formation of state social policy is associated with the awareness of the responsibility of the state and society for the welfare of each person. Of great importance for understanding the evolution of social policy are its two dimensions - moral, which is embodied in the age-old tradition of helping others, charity, and legal, which is to legislate such norms. On the one hand, these dimensions are indivisible, which is determined by their interaction and interpenetration in the functioning of the state and non-governmental organizations. On the other hand, the reasons for the emergence and general existence of legislation lie in a plane far removed from humanism.

According to the results of the analysis of the state of administrative and legal regulation of state social policy, it is established that since independence in this area, it has, firstly, developed rapidly and updated in accordance with those problems that needed to be addressed. Secondly, the administrative and legal legislation in this area was of poor quality, which is one of the main reasons for the ineffectiveness of many program documents that defined the state social policy. The main shortcomings of the legislation that regulated the activities in this direction at different historical stages include: insufficient scientific substantiation of certain public policy measures; declarativeness of state policy; lack of clear mechanisms for implementing state policy measures; a large number of changes and additions to the legislation governing the social sphere, its instability and inconsistency and inconsistency of certain norms.

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OF CONSTITUTIONAL DUTIES (ACCORDING TO THE DECISIONS OF THE CONSTITUTIONAL COURT OF UKRAINE)

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Abstract. The article establishes that the Constitutional Court of Ukraine has ruled on such constitutional obligations as: protection of the Fatherland, payment of taxes and fees, observance of the Constitution of Ukraine and laws of Ukraine. The following approaches contained in the decisions of the Constitutional Court of Ukraine on ensuring the fulfillment of constitutional duties of man and citizen are revealed: 1) on the duty to defend the Fatherland - an entity whose function is the duty to protect the state, the whole Ukrainian people; military service is not a function, but a constitutional duty of such a circle of subjects as citizens of Ukraine; this constitutional duty consists in: 1) ensuring the defense of Ukraine; 2) protection of the sovereignty of Ukraine; 3) protection of the territorial integrity of Ukraine; 4) protection of the inviolability of Ukraine; the performance of this duty involves the voluntary or conscription of military service; military service is a form of fulfilling the duty of a citizen of Ukraine; the special status of servicemen should be enshrined in the legislation of Ukraine, as well as the procedure for military service by citizens of Ukraine should be regulated; 2) on the obligation to pay taxes and fees in the manner and amounts prescribed by law - the provisions of Art. 67 of the Constitution of Ukraine should be developed in the legislation of Ukraine; the competence of controlling bodies should be defined in the legislation and this legislation should be qualitative; in the legislation of Ukraine and in practice the following concepts should be distinguished - the tax god of an individual and the tax debt of the taxpayer, as well as the concept of prohibition to travel abroad and restriction of the right to travel abroad; the practice of applying the law should be such as to prevent the violation of a person's right to inviolability of the home on the one hand, and to ensure the fulfillment of a person's tax obligations; the legislation of Ukraine should clearly state the grounds for the application of administrative seizure of the taxpayer's property, as well as the range of measures that may be taken by the state to ensure the taxpayer's performance of its duties; 3) regarding the obligation to strictly abide by the Constitution of Ukraine and the laws of Ukraine - the legislation of Ukraine should enshrine the responsibility for showing disrespect for a person by such entities as the state and its citizens.

Key words: duties of a person and a citizen, fulfillment of constitutional duties, the Constitutional Court of Ukraine, protection of the Fatherland, payment of taxes and fees, observance of the Constitution of Ukraine and laws of Ukraine.

Formulation of the problem. It is well known that a person not only has rights and freedoms, but also has responsibilities [1]. A number of them are enshrined in international acts of universal and regional nature [2]. The constitutions of states and the legislation of states also enshrine the responsibilities of man and citizen. The state is obliged to create an effective mechanism for their provision [3]. The constitutional courts of the states play a key role in such a mechanism. The Constitutional Court of Ukraine is a body of constitutional jurisdiction that ensures the supremacy of the Constitution of Ukraine, decides on the compliance of the Constitution of Ukraine with the laws of Ukraine and other acts provided by the Constitution of Ukraine, carries out official interpretation of the Constitution of Ukraine and other powers. Decisions of the Constitutional Court of Ukraine have a direct impact on the normative-legal and organizational-legal mechanisms of ensuring the fulfillment of constitutional duties by a person and a citizen. Therefore, the study of the decisions of the Constitutional Court of Ukraine on this issue is relevant and practically ripe.

Analysis of recent research and publications. In the science of constitutional law, the issue of constitutional duties of man and citizen was studied by D. Belov [5], Y. Bisaga [6; 7; 8], O. Vasilchenko [9], L. Deshko [10; 11; 12; 14], N. Mishina [13], O. Sovgire [15] and other scholars in analyzing the issue of constitutional rights and freedoms of man and citizen. At the same time, the decisions of the Constitutional Court of Ukraine on ensuring the fulfillment of constitutional duties were not analyzed. This indicates the relevance of such a study for the science of constitutional law.

The purpose of the article is to identify the approaches contained in the decisions of the Constitutional Court of Ukraine to ensure the fulfillment of the constitutional duties of man and citizen.

Presenting main material. The Constitution of Ukraine enshrines the following responsibilities of a person and a citizen: to strictly abide by the Constitution of Ukraine and the laws of Ukraine; not to encroach on the rights and freedoms, honor and dignity of others; responsibilities in marriage and family; parents are obliged to support their children until they reach the age of majority; adult children are obliged to take care of their disabled parents; obtain a complete general secondary education; not to harm nature, cultural heritage; to reimburse damages; to pay taxes and fees in the manner and amounts prescribed by law, protection of the Fatherland, independence and territorial integrity of Ukraine; respect for the state symbols of Ukraine [16].

The Constitutional Court of Ukraine in the decision on the constitutional complaints of Skrypka Anatolii Volodymyrovych and Bobyr Oleksiy Yakovych regarding the constitutionality of the provisions of part three of Article 59 of the Law of Ukraine "On the Status and Social Protection of Citizens Affected by the Chornobyl Accident" of April 25, 2019 №1-r (II) / 2019 notes that "the content of Articles 17 and 65 of the Constitution of Ukraine shows that the protection of the state and ensuring its security are the most important functions of the entire Ukrainian people. Military service is a constitutional duty of the citizens of Ukraine, which is to ensure the defense of Ukraine, protection of its sovereignty, territorial integrity and inviolability. Servicemen include persons who undergo such service, in particular in the Armed Forces of Ukraine. Military service is preceded by the need to fulfill the constitutional military duty, which provides for military service by citizens of Ukraine (voluntarily or by conscription). Given the specifics of military service, which consists, in particular, in the performance of special tasks by servicemen, the presence of risks to their lives and health, etc., any form of military

service is the duty of Ukrainian citizens to protect the state. Thus, the duty of citizens of Ukraine enshrined in the Constitution of Ukraine needs respect, and the status of servicemen of any category is determined by military service, the institution of which gives them a special status (paragraphs nine, ten of subparagraph 2.1 of paragraph 2 of the motivational part) “[17].

Thus, the whole Ukrainian people is the subject whose function is the duty to protect the state and ensure its security. Military service itself is not a function, but a constitutional duty of such a circle of subjects as citizens of Ukraine. This constitutional duty is to: 1) ensure the defense of Ukraine; 2) protection of the sovereignty of Ukraine; 3) protection of the territorial integrity of Ukraine; 4) protection of the inviolability of Ukraine.

The performance of this duty involves voluntary or conscription. Conscription and military service are interrelated but not identical. Military service is a form of fulfilling the duty of a citizen of Ukraine. The legislation of Ukraine should enshrine the special status of servicemen, as well as regulate the procedure for military service by citizens of Ukraine.

In the Decision of the Constitutional Court of Ukraine in the case of the constitutional petition of 53 people’s deputies of Ukraine on the constitutionality of certain provisions of the Tax Code of Ukraine of June 12, 2012 № 13-rp / 2012 the Constitutional Court of Ukraine notes that «... enshrined in subparagraph 16.1 .13 paragraph 16.1 of Article 16, subparagraph 20.1.11 of paragraph 20.1 of Article 20 of the Code the competence of regulatory authorities and the duty of taxpayers are necessary conditions to ensure compliance with the provisions of part one of Article 67 of the Constitution of Ukraine, according to which everyone is obliged to pay taxes in the manner and amount prescribed by law “[18]. Thus, the requirements of Art. 67 of the Constitution of Ukraine should be developed in the legislation of Ukraine, ie an appropriate legal mechanism should be created to ensure that everyone fulfills the obligation to pay taxes and fees in the manner and amounts prescribed by law. In this case, the competence of regulatory authorities should be defined in the legislation, which is high quality.

Paragraph 5 of sub-clause 3.3 of clause 3 of the motivating part of this decision of the Constitutional Court of Ukraine states that “Analysis of the above provisions of the Code gives grounds to state that they do not prohibit a natural person with a tax debt 94 applies only to the restriction of the taxpayer’s right to property in respect of his property if the person has a tax debt and travels abroad “[18]. Thus, in the legislation of Ukraine and in practice, the following should be distinguished: the tax god of an individual and the tax debt of a taxpayer; ban on travel abroad and restriction of the right to travel abroad.

The decision also states that “the Constitutional Court of Ukraine considers that the use of administrative seizure of the taxpayer’s property in order to ensure the performance of this taxpayer’s duties does not violate a person’s right to inviolability of the home. Thus, the administrative seizure of the taxpayer’s property does not deprive the taxpayer of the right of ownership of such property guaranteed by Article 41 of the Constitution of Ukraine “[18]. It follows that the application of the law must go in such a way as to prevent the violation of a person’s right to inviolability of the home on the one hand, and to ensure the fulfillment of a person’s tax obligations. It also follows that the legislation of Ukraine should clearly state the grounds for the administrative seizure of the taxpayer’s property, as well as the range of measures that may be taken by the state to ensure the taxpayer’s performance of its duties.

In the decision of the Constitutional Court of Ukraine in the case on the constitutional petition of the Verkhovna Rada of Ukraine Commissioner for Human Rights on the constitutionality of certain provisions of part two of Article 8, the second sentence of part four of Article 16 of the Law of Ukraine “On Citizens’ Appeals” declared incapable by the court) of October 11, 2018 № 8-r / 2018 refers to such a duty of a person and a citizen as observance of the Constitution of Ukraine and the laws of Ukraine. In particular, the Constitutional Court of Ukraine notes that “the definition in the Constitution of Ukraine of a person as the highest social value in Ukraine imposes an obligation on both the state and its citizens to show the necessary respect for each person. Part one of Article 68 of the Basic Law of Ukraine stipulates that everyone is obliged to strictly abide by the Constitution of Ukraine and the laws of Ukraine, not to encroach on the rights and freedoms, honor and dignity of other people “[19]. Thus, the legislation of Ukraine should enshrine the criteria of non-respect for human beings, as well as the responsibility for the detection of disrespect for human beings by such entities as the state and its citizens.

Conclusions.

1. It is established that the Constitutional Court of Ukraine has ruled on such constitutional obligations as: protection of the Fatherland, payment of taxes and fees, observance of the Constitution of Ukraine and laws of Ukraine.

2. The following approaches contained in the decisions of the Constitutional Court of Ukraine to ensure the fulfillment of the constitutional duties of man and citizen are identified: 1) regarding the obligation to defend the Fatherland, it is established that ensuring its security is the whole Ukrainian people; military service is not a function, but a constitutional duty of such a circle of subjects as citizens of Ukraine; this constitutional duty consists in: 1) ensuring the defense of Ukraine; 2) protection of the sovereignty of Ukraine; 3) protection of the territorial integrity of Ukraine; 4) protection of the inviolability of Ukraine; the performance of this duty involves the voluntary or conscription of military service; military service is a form of fulfilling the duty of a citizen of Ukraine; the special status of servicemen should be enshrined in the legislation of Ukraine, as well as the procedure for military service by citizens of Ukraine should be regulated; 2) regarding the obligation to pay taxes and fees in the manner and amounts established by law, it is established that the provisions of Art. 67 of the Constitution of Ukraine should be developed in the legislation of Ukraine; the competence of controlling bodies should be defined in the legislation and this legislation should be qualitative; in the legislation of Ukraine and in practice the following concepts should be distinguished - the tax god of an individual and the tax debt of the taxpayer, as well as the concept of prohibition to travel abroad and restriction of the right to travel abroad; the practice of applying the law should be such as to prevent the violation of a person’s right to inviolability of the home on the one hand, and to ensure the fulfillment of a person’s tax obligations; the legislation of Ukraine should clearly state the grounds for the application of administrative seizure of the taxpayer’s property, as well as the range of measures that may be taken by the state to ensure the taxpayer’s performance of its duties; 3) regarding the obligation to strictly abide by the Constitution of Ukraine and the laws of Ukraine, it is established that the legislation of Ukraine should enshrine the responsibility for showing disrespect for a person by such entities as the state and its citizens.

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MODERN APPROACHES TO THE DEFINITION OF ADMINISTRATIVE SERVICES AND THEIR FEATURES IN UKRAINE

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Abstract. This article considers the issues of modern approaches to the definition of administrative services and their features in Ukraine. The author found that in modern conditions, the rapid development and at the same time change public relations, require public authorities to improve existing and develop new, better tools to meet the needs of citizens and other participants in legal relations. The opinion of other authors on the similarity of the preconditions for the emergence and development of the institution of administrative services in the European Union and Ukraine, and especially the similarity of the processes of modern understanding of human relations, a new model of public authority and building a democratic, social state governed by the rule. The new model of administrative and legal thinking, qualitative renewal and formation of a modern doctrinal understanding of the content of the field of administrative law, within which the said legal institution is formed. Particular attention is paid to the analysis of the genesis and modern approaches to determining the institution of administrative services in Ukraine. Based on the scientific and legal analysis, the author proposes the following definition of the concept of administrative service as a public service activity of public authorities which results in an administrative act or action that has legal consequences of the request of a natural or legal person, has a right-establishing and human rights (law enforcement) character. And is committed (carried out) in order to ensure and implement subjective rights and legitimate interests, the performance of duties of the applicant (initiator). The article establishes the difference between the concepts of «management» and «administrative» services, and in conclusion reveals the characteristics of administrative services, which distinguishes it from other administrative and legal institutions.

Key words: administrative services, public authorities, services, management services.

Formulation of the problem. The deep meaning of the new historical paradigm of the relationship between the state and individual is the fact, that the dominant place in the former ideology of «governance» of people was taken by the opposite - the ideology of «service» of the state to a person. The practical implementation of such state role is possible only if the implementation of the constitutionally provided rule of law principle is real, also the subordination of state institutions to the needs of realization and protection of human rights, ensuring their priority over all other values of a democratic society. In this context, one of the urgent tasks is the introduction of a new ideology of public authorities as activities to ensure the realization of rights, freedoms, and legitimate interests of individuals and legal entities in the provision of administrative services [2, p. 23-24].

The state of the study. The state of the study. The analysis of issues related to the formation, development, and improvement of the institute of administrative services is devoted to a significant number of scientific and methodological developments by both scientists-theorists and specialists in the field of practice. Thus, the peculiarities of the legal regulation of services as a legal category, including as an administrative-legal category, are devoted to the works of many scientists, including: V. B. Averyanov, N. O. Armash, Y. E. Bartz, V. T. Belous, I. P. Golosnichenko, M. O. Kolesnikov, IB Koliushko, TO Kolomoyets, AS Kecha, OS Letneva, N. Maryniak, O. A. Martyniuk, V. V. Nikitin, S. O. Slobodyanyuk, O. V. Sukmanova, V. P. Timoshchuk, O. G. Tsyganov, M. O. Tsurikov, K. A. Fuglevich and many others.

Instead, in modern conditions, the rapid development and at the same time the change of public relations require public authorities to improve existing and develop new, better tools to meet the needs of citizens and other participants in legal relations. Among such tools is the administrative-legal institute of administrative services. The field of legal relations related to this institution requires permanent analysis and improvement of theoretical and applied understanding, study best practices of foreign experience, given its special place among other institutions of law. In addition, a feature of the regulation of administrative services is their direct «proximity» to consumers, beneficiaries of these services, the quality of which today is an indicator of the effectiveness of the state mechanism. Therefore, the aim of the article is to analyse the genesis and modern approaches to determining the institution of administrative services in Ukraine.

Presenting main material. The defining feature of the development of administrative legislation in democratic countries is its focus on ensuring the rights and legitimate interests of individuals in relations with the state and its bodies. One of the most important guarantees of this is a clear regulation of the procedural aspect of the relationship between the individual and the government. The largest legal relations in the interaction of public bodies and individuals and legal entities are formed in the process of providing administrative services, so the regulation of procedural activities within these relations should create conditions for the implementation of constitutional rights and protect them from possible abuse of power by officials [4, p. 126-127].

In general, as noted in the legal scientific literature, the theory of public services is borrowed from the experience of developed countries (UK, USA, Canada, etc.), where since the 80s of XX century there has been a change of priorities in government, as well as principles and form relations between the government and citizens. Individual, his rights and freedoms are recognized as the main social values, and the main task of public administration is to provide quality services to citizens. Accordingly, citizens in relations with the authorities are not petitioners, but the consumers of the state. At the same time, the state, represented by public entities, focuses on the needs of the individual, just as in the private sector, service providers focus on the needs of the consumer («customer»), his requests and expectations. In Ukraine, when using the category of «services», the main emphasis are on legal aspects, and in particular, on the administrative procedure for their provision. This can be explained by the fact that the main ideologues of services introduction theory in Ukraine are, first of all, representatives of administrative law science (Averyanov, Koliushko). Since the main opponents of this theory are also representatives of legal science, who question the very possibility of using the category of «services» concerning the activities of public authorities and local governments, this led to particularly lively discussions on this issue in jurisprudence [1, p. 116].

In this context, it is worth noting the similarity of the preconditions for the emergence and development of the institution of administrative services in the European Union and Ukraine, and especially the similarity of the processes of modern understanding of human relations, a new model of public power and also democratic and social rule of law creation of a new model of administrative and legal thinking, qualitative renewal and formation of a modern doctrinal understanding of the content of administrative law field, within which the legal institution is formed [13, p. 7].

In general, as O. Bukhanevych points out, the emergence of the term «administrative services» in the domestic legal doctrine is associated with the beginning of administrative reform in Ukraine, which was a consequence of the need for the state to respond to changes in public relations. This stage of development of Ukrainian society was marked by the active introduction of European standards, change of principles and forms of relations between government and citizens, introduction of a new philosophy of public administration, the essence of which is not to manage society but to provide services, to «serve» society and man. The key stage in the development of legislation in the field of administrative services was the adoption of the Law of Ukraine «On Administrative Services» [3, p. 7].

Tsyganov O. points out that the administrative reform started with the approval of the Concept of Administrative Reform in Ukraine by the Ukaz (Decree) of the President of Ukraine of July 22, 1998, which is already invalid today.

This normative legal act for the first time used the concept of services provided by the executive branch. The concept of administrative reform in Ukraine contained such concepts as «public service» and «management service» [10].

Tsyganov O. substantiates that today the phenomenon of administrative services should be considered not only concerning the novelty of the institute of administrative law of Ukraine, but also as belonging to a new theoretical direction in the framework of legal science.

At the same time, the scientist's opinion that the theory of administrative services is essentially a national acquisition seems quite controversial. However, as the scientist goes on to say: its main provisions were borrowed from the experience of developed countries, in which the doctrine of «new public management» flourished in the 80s of last century [13, p. 12].

The concept of administrative services with their features are extremely complex and multifaceted categories. The study of administrative services should be aimed at developing a single theoretical concept, which would be successfully confirmed by the practical activities of state executive bodies to implement the powers exercised by them at the request of the subject. That is why Marynyak N., taking into account scientific and legislative approaches to the definition of administrative services, suggests that the term «administrative services» should be understood as public services provided by executive authorities, local governments and other authorized entities, and the provision of which related to the exercise of power to adopt following regulations on the application of a company or person an administrative act aimed at the implementation and protection of its rights and legitimate interests and / or to fulfill the statutory obligations to obtain a permit (license), certificate and other documents, registration, etc. [8, p. 64].

It is interesting to note that, as I. Koliushko and A. Lipentsev point out, at first the experts suggested using the term «management services». But this term has been rightly criticized, because management services are often understood as the maintenance of the

actual management process, including the private sector. In addition, there is a «broad» understanding of the concept of management services, in fact, identical to the concept of «public services», which also covers services for which public authorities and local governments are indirectly responsible (e.g. medical care). Considering also that the administrative (management) service has the final form of an individual administrative act and is the result of administrative proceedings, we can conclude about the feasibility and correctness of the use of the concept of «administrative services» [6, p. 103; 7, p. 142].

At the same time, as V. Bilous notes, the main ideologues of the introduction of the theory of services in Ukraine are representatives of the science of administrative law (V. Averyanov, I. Golosnichenko, I. Koliushko, V. Tymoschuk) noted the expediency of using the term “administrative services” in the current legislation, and not “state (management) services”. To increase the efficiency of public administration it is necessary to focus on the activities of executive authorities and local governments, so the category of «administrative services» is for it [2, p. 26].

Back in 2002 in a monographic study of administrative reform, Koliushko I. pointed out that the study of administrative services should be aimed at developing common methodological principles of their legal regulation and organization of the system of providing these services. The question of developing certain unified standards for the provision of administrative services can be quite reasonably raised. Such unification can result in a generalized normative act, which would be an important guarantee of protection of citizens’ rights in their relations with the authorities. And it can be a separate act, for example, the law on administrative services, or these relations can be regulated by the act with a wider subject of legal regulation, for example, the Law on the administrative procedure in executive bodies and local governments, especially as it is obligatory to regulate the procedure for consideration of individuals and legal entities applications [6, p. 108].

In the scientific legal literature, there is an opinion that the services provided by public authorities, as well as local governments, constitute the sphere of public services. Instead, it is necessary to take into account the existence of the sphere of relations, which can be described as private services, i.e. services provided by individuals, individual-entrepreneurs, and legal entities of private law.

The fundamental difference between public services and private sector services is the fact, that the private sector tries to maximize the range of services, and the range of public services should be based on the opposite principle when the state does only what the private sector cannot or should not do [12, p. 15].

Zaduhailo O. notes that the concept of «administrative services» in general has the same meaning as «services» in the private law sense: it is aimed at meeting certain needs of the person’s activities, which is carried out at his request. However, if the range of services in the private sector is constantly expanding for objective reasons, the sphere of administrative services has certain limitations related to the need for of regulation the activities of executive authorities and local governments to provide them. After all, within the legal approach, the right of a government body to provide any service is its authority. And in accordance with the Constitution of Ukraine, the powers of executive bodies and local governments are exclusively law-determined [5, p. 379].

In general, as noted in the scientific literature, a separate type of administrative activity of public administration is public service, the peculiarity of which as a type of administrative activity is that it implements the service approach, in which the public

administration in interaction with the individual is perceived as a service provider, and the person, as a customer, who receives the service. Thus, the work efficiency is estimated from the point of view of a person, who is satisfied with the rendered service quality. E. Sobol notes the signs of public service activity of public administration bodies, to which the author refers: by-laws; effectiveness; accountability; utility; efficiency. Thus, public service activities can be defined as regulated by administrative law, bylaws, voluntary activities of state executive bodies, executive bodies of local self-government, subjects of delegated powers to create conditions for the provision of administrative services to individuals and legal entities for effective implementation and protection their rights, freedoms and legitimate interests [11, p. 50].

This approach to the assessment of public service activities of public authorities seems somewhat controversial, especially in the context of defining such features as bylaws (regulated not only by law acts but “bylaw” acts). Because the critical and fundamental issues of providing certain services in the field of administrative public service activities of the state and local self-government are defined at the level of laws. For example, the main issues of providing administrative services in the field of state registration of real property rights are determined at the level of the Law of Ukraine «On Administrative Services» and the Law of Ukraine «On State Registration of Real Property Rights and Encumbrances».

As it was already mentioned, the methodological basis of the doctrine of administrative services is the concept of service of the state (government) to man (society), so the category of «administrative services» is the same as in private law (sector) which means the activity to satisfy certain the needs of the person at the request of that person. In this case, the administrative service can be considered in two aspects: a) as a public authority of the administrative body aimed at providing (legal registration) conditions for the exercise of the rights of a person, which is carried out at the request of this person; b) as a result of public authority of the administrative body aimed at providing (legal registration) conditions for the implementation of subjective rights of a person, which was carried out at the request of the person [12, p. 14].

Maryniak N. understands the concept of administrative service through the law enforcement activities, funded by the relevant budget, legally established, included in the powers of the competent state executive bodies, mandatory for them, aimed at realizing the rights or legitimate interests of a person it was initiated, as well as to ensure the performance of their duties [9, p. 229]. This definition is an attempt to combine the above approaches to understanding administrative service through «action» and «result», which in our opinion in modern conditions more fully reveals the essence of both public service activities of public authorities and directly related to such activities in implementation, guaranteeing and protecting the rights and interests of individuals and legal entities.

The scientist believes that the administrative service is available where there is a public interest in satisfying the private interest. Combining personal, public and state interests, this category is based on the dialectical unity of the individual, society and state. The modern understanding of administrative services covers all activities carried out in the interests of society as a whole under the auspices of state power. The provision of administrative services should be considered as a function of the modern welfare state. Administrative service can be considered as a legal relationship between the state or other structures under its care on the one hand, and citizens or legal entities on the other

hand. Specific features are: a set of actions or activities aimed at meeting the needs of a person of public interest; the presence of a certain result that has no material expression, but is of consumer value. The legal concept of administrative service can be formulated based on a summary of the above characteristics. This is expressed in the rules of law, guaranteed by the state purposeful activities to satisfy the rights and legitimate interests, the performance of certain duties by a person who initiates it [9, p. 297-298].

Conclusions. Summarizing the views of scholars on the features of administrative services, which distinguishes it from other administrative and legal institutions, we believe that we can present the following: 1) is the result of public service activities; 2) provided on the initiative of individuals or legal entities; 3) aimed at the implementation or protection of the subjective personal right or legitimate interest or duty performance; 4) is provided by state bodies power or local self-government or other bodies, delegating powers based on law; 5) is a law enforcement activity that involves both the process and the result; 6) the result of which is an administrative act or the commission of an action that has legal consequences that have an individualized nature related to the rights or legitimate interests of specific individuals or legal entities, usually the initiators.

Another special feature of administrative services as an institution of law is its intersectoral nature. Thus, in particular, the registration of house property rights in the process of providing administrative services includes both administrative-law and civil law rules, as well as other rules, depending on the specific situation. In addition, the world practice of providing administrative services shows that the process of «bringing services to the consumer» through decentralization processes has a positive impact on the quality and availability of such administrative services, promote the interests of individuals and legal entities in interaction with public authorities.

Considering provisions of the legislation and the acquisition of legal science, we propose the following definition of the concept of administrative service as a public service activity of public authorities which results in an administrative act or action that has legal consequences at the request of individuals and legal entities, has a right-establishing and human rights (law enforcement) nature and is committed (carried out) to ensure and implement subjective rights and legitimate interests, the performance of duties of the applicant (initiator).

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THE SPECIFICS OF THE FORMATION OF THE JUDICIARY OF CONSTITUTIONAL JURISDICTION ABROAD AND IN UKRAINE: FEATURES OF TAKING INTO ACCOUNT FOREIGN EXPERIENCE

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Annotation. The publication examines the formation of the judiciary of constitutional jurisdiction both in Ukraine and in foreign countries. Different approaches to the formation of the composition of the bodies of constitutional control are analyzed, the historical, economic, political and niche factors that determined a certain order of formation of such bodies are determined. The important role of the peculiarities of the formation of the composition of the bodies of constitutional jurisdiction in ensuring the independence of this body and in ensuring the proper legal protection of the constitution is noted. It is noted that the analysis of foreign experience in this issue is an impetus for expanding scientific and expert discussion in this direction in order to find the best ways to overcome the problem of quality formation of the Constitutional Court of Ukraine, given the established successful practices of foreign countries.

Keywords: body of constitutional jurisdiction; legal protection of the constitution; a judge of a body of constitutional jurisdiction; formation of the composition of the constitutional control body; independence of judges.

Introduction. The construction of the rule of law and the development of civil society require, first of all, the realization of the principles of the rule of law, the creation of conditions for the maximum protection of the rights and legitimate interests of individuals and legal entities. The rule of law is an expression of such a policy that meets the needs of society and cannot go beyond the law, the high moral principles enshrined in it [15]. One of the key issues in this aspect should be the creation by the state of favorable conditions for the functioning of a fair, independent and impartial court.

Topical issues of the organization of the judiciary and the improvement of the mechanism of selection of judges for positions have been the subject of attention of legal scholars at different stages of society [18]. The issue of forming the corps of judges of the Constitutional Court of Ukraine acquires special significance at the present stage of state formation, when the society in Ukraine is faced with ambiguous and sometimes unsubstantiated decisions of the body of constitutional jurisdiction.

These events started a discussion about the integrity of the CCU judges, and even more - about the possible reset of this body. However, according to the expert community, without changing the procedure for appointing judges to the CCU, one should not expect a qualitative renewal of the court, as the constitutional requirements for legal competence and integrity will remain just idealistic declarations [13]. Therefore, the purpose of this article is to try to find out the approaches to the formation of judicial

bodies in the bodies of constitutional jurisdiction in foreign countries in order to be able to implement this experience in the Ukrainian realities.

This issue has been actively studied by a number of scientists, among them it is worth mentioning such as: Avdeev D., Anakina T., Batanova N., Borislavskaya O., Brovchenko N., Burak O., Verlos N., Georgitsa A., Gorodovenko V., Green O., Grinyuk R., Guziy A., Gultay M., Gusar O., Zakharchenko M., Zayats I., Evseev O., Komarova T., Kuybida R., Lapka O., Pikulya T., Mentukh N., Mishina N., Mikhalyov V., Moldovan V., Moskvich L., Nazarov I., Pankevich O., Paslavskaya N., Pivovarov Y., Riznyk S., Sabodash V., Selivanov A., Slidenko I., Slinko S., Skomorokha L., Tolkachova I., Fedina D., Fedorenko V., Fedorchuk A., Fesenko L., Cheban V., Tsimbalisty T., Shapoval V., Shaptala N., Shevchuk S., Shevchuk O., Shishkin V. and others.

Presenting main material. As noted in the scientific literature, there are only three ways to form constitutional courts: 1) decisions on the composition of the constitutional court are made autonomously by bodies representing the three branches of government (Bulgaria, Georgia, Italy, Moldova, Ukraine); 2) the appointment (election) of judges of the Constitutional Court is carried out autonomously by bodies representing the two branches of government, the legislative and the executive (Austria, Canada, Romania, the Czech Republic); 3) the formation of the constitutional court is carried out with the participation and interaction of various branches of government. At the same time, the final decision on candidates for judges is made either exclusively by the legislature (Estonia, Lithuania, Germany, Poland, Hungary), or only by the head of state (Belgium, Denmark, Turkey). However, in both cases, the relevant bodies make decisions on the basis of submissions (proposals) submitted by the head of state or bodies representing other branches of government. Another option for cooperation in the formation of a body of constitutional justice is the approval of judges elected by parliament, the president of the state [16].

For example, in Bulgaria, Georgia, Italy, Moldova, Serbia, and Ukraine, the positions of judges of the constitutional court are filled equally by the president, parliament, and the assembly of judges or higher courts (the highest magistracy council). For example, in paragraph 1 of Art. 147 of the Constitution of the Republic of Bulgaria stipulates that "the Constitutional Court consists of 12 judges, one third of whom are elected by the National Assembly, one third is appointed by the President and one third is elected by the general meeting of judges of the Supreme Court of Cassation and the Supreme Administrative Court". 88 of the Constitution of Georgia states that "The Constitutional Court consists of nine judges-members of the Constitutional Court".

Three members of the court are appointed by the President of Georgia, three members are elected by the Parliament, and three members are appointed by the Supreme Court", in part 1 of Art. 135 of the Constitution of the Italian Republic stipulates that "the Constitutional Court consists of fifteen judges, appointed by one third: the President of the Republic, the Parliament at a joint sitting of the chambers and the highest general and administrative magistrates."

In most foreign countries, a mixed method is used, in which representatives of different branches of government participate in the formation of constitutional control bodies, either individually or together.

For example, in Italy, the Constitutional Court consists of 15 judges appointed by one-third by the President, Parliament at a joint sitting of the Chambers and the highest courts (the Court of Cassation elects three judges, the Council of State and the Accounting Chamber one each).

A similar procedure exists in Bulgaria, where the Constitutional Court consists of 12 judges, one third of whom are appointed by the President, one third are elected by a non-people's assembly, another third - by the general meeting of judges of the Supreme Court of Cassation and the Supreme Administrative Court [14, p. 23-27].

Greece, on the other hand, has a unique procedure for forming a body of constitutional jurisdiction. To exercise constitutional jurisdiction, a Special Supreme Court is established, consisting of the President of the Supreme Administrative Court, the President of the Supreme Civil and Criminal Court, the President of the Court of Auditors, 4 advisers to the Supreme Administrative Court, 4 members of the Supreme Civil and Criminal Court. . In certain cases provided for by the Greek Constitution, two law professors from the law faculties of Greek universities are added to this court, who are also selected by lot. In some countries, the judiciary is not in itself the subject of the appointment of judges of the constitutional court, but it submits to the relevant subject a request for their appointment. For example, in Spain the General Council of the Judiciary submits to the King the appointment of 2 out of 12 judges, in Latvia the Plenum of the Supreme Court submits to the Seimas 2 out of 7 judges, and in Lithuania the President of the Supreme Court submits to the Seimas 3 out of 9 judges [13].

The procedures for the formation of the constitutional courts of these states are aimed at achieving two goals that remained unfeasible in Ukraine, namely:

- a) depoliticization of the process of obtaining powers by judges of a constitutional body. In this regard, a special threat is posed by the parliamentary majority, structured mainly by party parliamentary factions;
- b) the accession to the Constitutional Court not only of professional lawyers (for example, judges), but of those who are authoritative bearers (and creators) of legal doctrine.

Ways to achieve such goals are different. In the Slovak Republic, in accordance with the new version of Art. 134 of the Constitution, the constitutional court consists of 13 judges, and the parliament (National Council of the Slovak Republic) prepares applications for judicial positions with the expectation that their number will double the number of vacancies, and judges are appointed by the President of the Slovak Republic.

In the Republic of Hungary, the experience of forming a constitutional court is particularly instructive for Ukraine. The procedure for obtaining the powers of judges of the Constitutional Court is defined in the Constitution of this state as follows: "Eleven members of the Constitutional Court are elected by the National Assembly. Proposals for candidates for members of the Constitutional Court are put forward by the Nomination Commission, which consists of members of deputy party factions that have representation in the State Assembly. Two-thirds of the votes of the deputies of the State Assembly are required for the election of members of the Constitutional Court [11, p. 55-67].

The process of formation and reform of the Constitutional Court in Germany is interesting for analysis. The establishment of the Federal Constitutional Court in Germany was provided for by the Constitution of 1949, and its functioning became possible after the adoption of the 1951 Act.

The formation and operation of the Federal Constitutional Court of Germany (Bundesverfassungsgerichts) are regulated by: 1) the Constitution of Germany; 2) Law "On the Federal Constitutional Court" (Bundesverfassungsgerichtsgesetz - BVerfGG).

The court consists of 16 judges. The Federal Constitutional Court consists of two senates, each of which elects 8 judges. Three judges of each senate must be elected from

among the judges of the Supreme Federal Courts (Supreme Federal Court, Federal Administrative Court, Federal Finance Court, Federal Court of Labor Disputes and Federal Social Court). As a rule, judges who have at least 3 years of experience as one of the Supreme Federal Courts have the right to be elected. The Bundesrat and the Bundestag appoint half of the judges of each Senate of the Court [1; 17, c. 2].

Senates do not have the right to control each other's decisions, if one Senate does not agree with the legal position of the other, the decision in this case is made by the Plenum of all judges of the Federal Constitutional Court [5, p. 801]. The decision to convene the Plenum is made exclusively by the Senate, which is primarily responsible for the case. The competence of the Plenum also includes making decisions on dismissal of FCC judges from their positions or their retirement. According to paragraph 3 of the Act, a judge must reach the age of 40, have the right to be elected to the Bundestag, give written consent to membership in the Federal Constitutional Court and be suitably qualified as a judge. It is equated with a law degree obtained in the GDR. Three judges of each Senate are elected from among the federal judges of the other federal courts. Such a rule should ensure that judicial experience is taken into account in the administration of justice by the FCC. For all FCC judges, this service is the main place of work. Only teaching activities in higher educational institutions can be combined with the activities of a judge of the Federal Constitutional Court [3]. FCC judges are elected for a term of 12 years; age requirement - 68 years. Re-election is not allowed to guarantee their independence [2].

Let's turn to the experience of Austria. The first law on the Constitutional Court of 1920 was amended on December 7, 1929, and on December 18, 1925, the formation and operation of the Constitutional Court of Austria were regulated by a separate Federal law. From 1934 to 1945, as a result of the so-called Dolfus coup, the Austrian Constitutional Court suspended its activities, and in 1953 a new Law on the Constitutional Court was adopted, which is still in force with changes and amendments.

As for the composition of the Constitutional Court of Austria, it includes the president, vice president, 12 judges and 6 non-core members. The members of the court are appointed by the President of Austria on the proposal of the Federal Board, the National Council and the Bundesrat. Members of the Constitutional Court must have a legal education and legal experience of 10 years. As the court works in sessions on average 4 times a year, judges can engage in their usual activities between sessions. The exception is the ban on any political activity [7].

Various aspects of the functioning of the Constitutional Court of Lithuania (Lietuvos Respublikos Konstitucinis Teismas) are regulated by the following legal acts: 1) the Constitution of the Republic of Lithuania; 2) the Law "On the Constitutional Court"; 3) Rules of Procedure of the Constitutional Court. The Constitutional Court of Lithuania consists of 9 judges, whose term of office is 9 years. Every three years, the composition of the court is renewed by a third. The Seimas appoints an equal number of judges of the Constitutional Court from among the candidates nominated by the President of the Republic, the Speaker of the Seimas and the Chairman of the Supreme Court. According to Article 5 of the Law "On the Constitutional Court", a candidate for the position of a judge of the Constitutional Court may be a person who: 1) is a citizen of Lithuania; 2) has an impeccable reputation; 3) has a higher legal education; 4) for 10 years worked in the field of law or in the field of legal science [9; 17, c. 4-5].

The process of forming the Constitutional Court of Belgium is interesting. In 1980, the Constitution assigned the Constitutional Court, which is not considered part of the

judiciary and half of whose members are former parliamentarians, to the control of the division of powers between the authorities and the revision of their rules of law. The aim was to ensure a unified approach in the implementation of the constitutional interpretation in cases concerning the powers of the federal authorities and the subjects of the federation. In addition to this first mission of the Constitutional Court, its jurisdiction was later extended to the conformity of legislation with the rights and freedoms of the individual. Since 1988, the Constitutional Court has been empowered to monitor compliance with Articles 10 and 11 (principle of equality and non-discrimination) and 24 (right and freedom of education) of the Constitution, and since 2003 the Court's jurisdiction has been extended to Section II (Belgians and their rights), as well as Articles 170, 172 and 191 (principles of legality and equality in tax matters, as well as protection of foreigners) [8].

The court consists of 12 judges, six Dutch-speaking and six French-speaking. At least one of the judges must also know German. Each language group consists of three judges appointed on the basis of their legal experience (professors of law at a Belgian university, judicial staff in the Supreme Court or the State Council, legal secretaries in the Constitutional Court) and three judges with at least five years' experience as members of parliament. . The court consists of judges of both genders, at least one third of the smallest group. Judges are appointed by the King of Belgium for life. Candidates for the position of judge of the Constitutional Court of Belgium must be at least forty years old. Judges may hold office until the age of seventy. There are strict rules of incompatibility with another position or professional activity. Judges of each language group elect a president, who presides in turn for a term of one year, beginning on September 1.

It is also worth mentioning the experience of those countries where the function of constitutional control is exercised by quasi-judicial bodies. For example, France, which is one of those European countries that tried to form its own specific institution of constitutional control, which was called the Constitutional Council and emerged immediately after the adoption of the Constitution of the Fifth Republic in 1958. It is called quasi-judicial, because when considering the issues before the reform of 2008 there was virtually no competition between the parties, the process was closed and in writing, as the council exercised only preliminary control, ie checked for compliance with the Constitution only draft regulations. Following the reform, follow-up control was finally introduced, albeit with some restrictions. Thus, constitutional control is impossible with regard to laws adopted in referendums, and acts of the President that are not related to the exercise of delegated powers are not subject to constitutional control.

The Constitutional Council consists of 9 members, whose term of office is 9 years and is not renewable, and every three years the council is renewed by one third. Three members are appointed by the President, three by the President of the National Assembly and three by the President of the Senate. The 2008 reform gave Parliament the right to approve members previously appointed by the relevant entities [4]. In addition, the council includes all former Presidents for life. The Constitutional Council must have two members - specialists in constitutional law.

In Spain, after the overthrow of the Franco dictatorship, constitutional law was very poorly developed, the Constitutional Court did not exist at all, so the constitutional doctrine was not formed. Modern democratic Spain has borrowed many provisions from the German *Verfassungsdogmatic*, sometimes even without translation, for which it is often criticized by scholars. Only Spanish citizens with legal education, experience

as judges or prosecutors, university professors, civil servants, and all lawyers with a generally recognized authority of at least 15 years of age may be appointed as one of the 12 judges of the Spanish Constitutional Court. legal practice. There are scientific advisers in the structure of the Court. The Constitutional Court is assisted by lawyers who are selected on a competitive basis from among civil servants who have passed a special legal examination for the highest scores. The court may also appoint temporary advisers, who may be:

- a) law teachers who have been teaching or researching for at least five years and who have obtained the necessary accreditation to obtain the degree of professor, doctor or other relevant degree from public or private universities;
- b) members of the judiciary and lawyers with at least five years of professional experience;
- c) civil servants who have passed a special legal examination for the highest scores and have at least five years of professional practice;
- d) scientific advisers with at least ten years of professional experience [6].

It is also interesting to note that in the Netherlands and Finland there is no institution of constitutional control among European countries at all. In the Netherlands, the Constitution presupposes the inviolability of laws, and therefore the courts do not have the right to consider the constitutionality of laws. The same rule applies in Finland, but according to the interpretation of the law, not the Constitution. Courts are not authorized to draw conclusions about the constitutionality of laws or to refuse to draw conclusions about the constitutionality of laws or to refuse to apply a rule of law on the grounds of its unconstitutionality. At the same time, they are not entitled to apply the rules of bylaws that are directly contrary to the Constitution [12].

Conclusion. The role and significance of the body of constitutional justice in the society and legal and political system of the modern constitutional, democratic state is extremely important.

The Constitutional Court, as a body of constitutional control, occupies an important place in the mechanism of legitimation of state power, as it is designed to protect the constitutionally enshrined sovereign rights of the people from illegal actions and decisions of public authorities. To this end, the Court must act as an unconditional authoritative body of state power, endowed not only with the right but also with a real opportunity to take measures aimed at protecting the Constitution. One of the important elements of ensuring this status is the proper and high-quality filling of the Court with highly professional staff, which is primarily related to the processes of forming the composition of the CCU.

However, as noted in the scientific and expert community, even in those European countries where the so-called mixed principle of forming the body of constitutional jurisdiction (as in Ukraine), no universal approach to the appointment of judges of the constitutional court is used, because each state regulates this issue. in his own way. Therefore, proposals are made, in particular, given the peculiarities of our political system and the incompleteness of judicial reform, it would be appropriate to exclude the Congress of Judges from among the entities authorized to form the Constitutional Court of Ukraine (let's not forget that this requires changes to Of the Constitution), and to entrust the procedure of selection of CCU judges to the relevant commission, the members of which would be nominated by both national and international experts [13]. The solution of these issues is extremely important, and therefore is an impetus for expanding scientific and expert discussion in this direction in order to find the best ways

to overcome the problem of quality formation of the Constitutional Court of Ukraine, given the established successful practices of foreign countries.

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THEORETICAL AND PRACTICAL ISSUES OF CONSTITUTIONAL CONTROL IN THE PROCESS OF AMENDING THE CONSTITUTION: FEATURES OF IMPLEMENTATION

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Based on the approaches adopted, in particular, in domestic legal science, the constitution as the basic law is the only normative legal act of the highest power (in some countries several such acts), which regulates certain aspects of social life in its economic and general political dimensions. language with the organization and implementation of state rule; establishes the principles of the state system, the order of formation, organization and activity, first of all, of the key parts of the state mechanism - the highest bodies of the state; determines the foundations of the territorial organization of the state and, accordingly, state power; fixes the basics of the legal status of the individual, his legally expressed relationship with the state [12, p. 67].

At the same time, due to changes in public life, changes in the balance of political forces in different countries, constitutions need to be amended and supplemented, or there is a question of revising the current constitution or adopting a new constitution. "Flexible" constitutions are amended and supplemented in such a way that each subsequent law, which contains a constitutional norm, changes or supplements the previous one, and its adoption takes place in the same sequence as for the previous one. Thus all uncodified constitutions (Great Britain, Finland, Israel, etc.) are changed and supplemented. For "rigid" constitutions, a special, very complex procedure for making additions, changes and amendments has been established. Usually it is enshrined in the text of the constitution, and "rigidity" is designed to ensure the authority of the Basic Law and the stability of the constitutional order [4, p. 93].

However, V. Shapoval notes that the issues concerning the legal nature of acts (laws) on amendments or additions to the constitution, first of all adopted by the parliament, have long been recognized as debatable. Sometimes, in fact, adjusting the concept of constituent power, a distinction is made between primary and secondary constituent power, extrapolating the appointment of the former to the adoption of the constitution itself, and the appointment of the latter to its amendment. The thesis about the difference between the legal nature of the constitution and acts (laws) on amendments to it is due, in particular, to the fact that, starting from the second half of the XIX century, it became common practice to adopt the constitution by parliament - the legislature. But, in fact, at the same time the relevant activities of the parliament began to be interpreted as the implementation of not legislative but constituent power, which also showed some adjustment of the concept of constituent power [12, p. 78].

This indicates the need to ensure the protection of the constitution through, inter alia, the adoption of measures of constitutional review of laws amending the constitution.

Issues related to the amendments to the constitution and constitutional control investigated in this scientific publication have been studied by many representatives of the science of constitutional law, among them are: Baimuratov M., Baglay M., Batanov O., Vitruk N., Dzhun V., Dombrovsky I., Georgitsa A., Gergeliynyk V., Zhuravsky V., Zayets A., Kalyuzhny R., Kampo V., Kelman M., Kopeychikov V., Kozyubra M., Kopylenko O., Krivenko L., Kutafina O., Lazarev V., Lukashova O., Lun Z., Martynenko P., Marchenko M., Myronenko O., Nalyvayko L., Orzikh M., Pogorilko V., Riznyk S., Stetsiuk P., Tatsiy V., Teslenko M., Todyka Y., Tykhy V., Tsymbalysty T., Frytsky O., Tsvik M., Shapoval V., Shemshuchenko Y. and others. However, theoretical and practical issues of constitutional control in the process of amending the constitution remain insufficiently researched and scientifically developed, which is the purpose of this publication.

The idea of protecting the constitution arose simultaneously with the appearance of the first constitutions. It was embodied gradually finding its expression in the constitutional text itself or following from the development of judicial practice. Such means were the institution of repeal of acts, the establishment of a guarantor and "custodian" of the constitution, the institution of constitutional control, the procedure for amending the constitution and others. Such legal institutions arose specifically to preserve such a constitution per se, primarily as a set of material principles and values, as well as a formally defined document in which such principles and values are fixed. In the literature, such a special set of legal tools is now called protection, protection, guarantee of the constitution, and so on. The precondition for the protection of the constitution in the legal sense is a certain public consensus on key values, the presence of a certain civil culture, developed civil society, autonomous individual owner, ie all those prerequisites for constitutionalism, without which the implementation of an organic constitution will always face many problems [9, c. 8-9].

An element of protection or protection of the constitution is constitutional control.

The use of the term "constitutional control" provokes a number of discussions in scientific circles. In addition to defining the meaning of the term itself, many scholars argue which term should be used for "constitutional control" or "constitutional oversight," as discussed below. Instead, from the analysis of domestic legislation it can be concluded that the legislator does not distinguish between the terms "control" and "supervision". This is indicated, inter alia, by the title of the Law of Ukraine "On Basic Principles of State Supervision (Control) in the Sphere of Economic Activity" of April 5, 2007, which uses the words supervision and control at the same time as synonyms. Also, no domestic legal act contains a definition of "constitutional control" [6].

Genetic constitutional control has arisen in connection with the need to verify the constitutionality of ordinary laws passed by parliament. Gradually, a significant practice of constitutional jurisdictions regarding the previous or subsequent control over draft laws / laws amending the constitution has also emerged. At the same time, this approach has its pros and cons. At the same time, in some countries the doctrine of denying the jurisdiction of the constitutional review body over the relevant acts amending the constitution prevails [1, p. 9].

V. Shapoval interprets constitutional control as "the activity of courts of general or constitutional jurisdiction or so-called non-judicial bodies, aimed primarily at resolving issues of constitutionality of legal acts" [11].

Constitutional control, according to M. Kelman "is the activity of competent bodies to ensure the supremacy of the Constitution, laws and other regulations" [2, p. 19].

According to S. Pilyuk, today constitutional control is exercised in 164 countries, 74 of them have a specialized or European model (French version in 25 countries), 48 - American model, and 30 mixed model, based on the above two [5, p. 566].

Constitutions, as a rule, establish a special procedure for their amendment, supplementation or revision. At the same time, there are two main models in the world of empowering constitutional review bodies. According to the first, constitutional control over the procedure for amending the constitution is quite possible. Constitutional courts recognize the right to hear such cases, but conclusions on unconstitutionality are not often adopted at present. According to the second model, constitutional control over the procedure for amending the constitution is considered unacceptable. Thus, the law amending the constitution may be subject to 16 constitutional review after it turns out that these changes were adopted on the basis of violation of the procedure for its adoption (Turkey, Germany, Austria, Ukraine, Romania, Bulgaria, Hungary, Kyrgyzstan). A fundamentally different approach applies in countries such as France and the United States, where constitutional review bodies have refused to recognize such a right.

Mandatory substantive criteria may be established for amendments to the constitution, which must be met by the amendments. In this case, such criteria are usually formulated in a negative way (changes cannot be made on certain issues). There are two approaches to recognizing the ability of constitutional review bodies to consider substantive issues related to the content of amendments to the constitution. In some countries, the practice generally denies the possibility of establishing such control (USA, Iceland, Slovenia), in others - such constitutional control is recognized as necessary or possible (India, Turkey, Pakistan, Ukraine, Romania) [9, p. 15-16].

Considering the issue of constitutional control over amendments to the constitution, it is necessary to distinguish between previous and subsequent control. According to the Venice Commission, only in some countries does the constitutional court have the right to participate in the procedure of amending the constitution. Preliminary control is a rather rare procedural mechanism. Such control cannot be regarded as a requirement of the rule of law (CDL-AD (2012) 010), Opinion on the revision of the Belgian Constitution, § 49). As stated in paragraphs 51-57 of the Report of the Venice Commission at the 81st plenary session (Venice, 11-12 December 2009) "On constitutional changes" in some countries, the Constitutional Court plays a formal role in the constitutional amendment procedure (in Azerbaijan, Kyrgyzstan, Moldova, Turkey, Ukraine). Thus, in Moldova, a proposal for a constitutional amendment can be submitted to parliament only if it has the support of at least four judges of the Constitutional Court, which consists of 6 judges [1, p. 10].

Instead, it is worth referring to the next constitutional review of the law amending the constitution. Two different approaches have been formed in the legal doctrine and practice of the bodies of constitutional control of different countries. According to the first approach, the constitutional review body is not empowered to review laws amending the constitution. An example is De Gaulle's 1962 amendment to the 1958 Constitution of France, which establishes universal suffrage for the election of the President of France. De Gaulle put the proposed changes and additions to a referendum, ignoring the provisions of the Constitution to amend. This was accepted by the political community and was not rejected by the Constitutional Council, which stated that it did not have the competence to consider the issue. As the Venice Commission notes in paragraph 22 of the Report on Constitutional Changes, whether this is an example to follow is a moot point [1, p. 11].

It is known that draft laws on amendments to the Constitution are considered by the Verkhovna Rada only in the presence of an opinion of the Constitutional Court of Ukraine on their compliance with the requirements of Articles 157 and 158 of the Constitution of Ukraine. These articles of the Basic Law provide for a number of requirements for compliance with which the previous constitutional review is carried out, and the grounds for the Court's decision on the inconsistency of amendments to these articles of the Constitution can be divided into two types: substantive (internal) and objective conditioned (external). The substantive grounds for adopting an opinion on the impossibility of amending the Constitution include the following: anticipation of changes in the abolition or restriction of human and civil rights and freedoms; directing changes to the elimination of independence or to the violation of the territorial integrity of Ukraine. Objectively determined grounds - the presence of conditions of martial law or state of emergency; the presence of the facts of consideration of the same bill during the previous year, the previous amendment of the relevant provision of the Constitution of Ukraine by the parliament of the same convocation [7, p. 23-24].

The Constitutional Court of Ukraine does not have a direct norm in the Constitution of Ukraine regarding the presence or absence of the right to carry out a constitutional review of existing laws on amendments to the Constitution. According to many scholars of Art. 152 of the Constitution of Ukraine applies only to ordinary laws, not constitutional ones. However, there is a decision of the Constitutional Court, which expressed its views on this issue, which are different and contradict each other [3].

By Judgment №6-u / 2008 of 5 February 2008, the Constitutional Court of Ukraine took the same position as its French and American counterparts and refused to exercise constitutional control over the observance of the constitutional procedure for amending the Constitution, although it gave a rather vague and formal motivation, which was later changed [10].

Thus, in decision № 13-rp / 2008 of 26 June 2008, the Court stated that it was authorized by the Constitution to exercise preliminary constitutional review, and that it was he who should exercise "... subsequent constitutional review of the law amending the Constitution of Ukraine after its entry into force, as Lack of judicial control over the procedure of its consideration and adoption, defined in Section XIII of this Constitution, may result in restriction or abolition of human and civil rights and freedoms, liquidation of independence or violation of territorial integrity of Ukraine or change of constitutional order in a manner not provided by the Basic Law of Ukraine »[8]. Thus, the Court switched to another model of constitutional control, according to which it authorizes itself to exercise the next constitutional control over draft laws amending the Constitution of Ukraine.

Conclusions. Amendments to the constitution are an important stage of the constitutional process in order to ensure the relevance of the basic law, compliance with the relations prevailing in society and ensure the restriction of state power in favor of the people to ensure and protect human and civil rights and freedoms. In order to prevent the violation of the norms of the constitution, its compliance with the principles of the changes that are made to it, it is necessary to take measures to protect and safeguard it. One such way is constitutional control over the process of amending the constitution.

Despite the positive changes in the practice of constitutional control over the process of amending the constitution in Ukraine, the problematic issues of the competence of the Constitutional Court of Ukraine in this area remain unresolved, as well as problems of

weak detail of powers in the field of constitutional control by other public authorities. This requires the activation of the scientific and expert community in order to address these issues.

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