

АНАЛИЗ ОПЫТА РАБОТЫ ПО ЛИКВИДАЦИИ МЕДИКО-САНИТАРНЫХ ПОСЛЕДСТВИЙ ЧРЕЗВЫЧАЙНЫХ СИТУАЦИЙ У СПЕЦИАЛИСТОВ НЕШТАТНЫХ ФОРМИРОВАНИЙ СЛУЖБЫ МЕДИЦИНЫ КАТАСТРОФ МИНЗДРАВА РОССИИ И ФЕДЕРАЛЬНОГО МЕДИКО-БИОЛОГИЧЕСКОГО АГЕНТСТВА

А.П.Овчаренко¹, Р.Н.Лемешкин¹, В.Н.Толстошеев¹, А.В.Лучшев¹

¹ ФГБВОУ ВО «Военно-медицинская академия им. С.М.Кирова» Минобороны России, Санкт-Петербург, Россия

Резюме. Цели исследования – определить наличие опыта работы по ликвидации медико-санитарных последствий чрезвычайных ситуаций (ЧС) у медицинских специалистов из состава нештатных формирований (НФ) Службы медицины катастроф (СМК) Минздрава России и Федерального медико-биологического агентства (ФМБА России); проанализировать его особенности: частоту привлечения медицинских специалистов в составе НФ к работе по ликвидации медико-санитарных последствий ЧС; опыт работы в условиях массового поступления пострадавших; участие в медицинской сортировке и организации проведения медицинской эвакуации.

Материалы и методы исследования. Для проведения исследования было выполнено анкетирование специалистов НФ СМК Минздрава России и ФМБА России.

В исследование были включены 206 медицинских специалистов из лечебных медицинских организаций (ЛМО) Минздрава России и 49 медицинских специалистов из ЛМО ФМБА России.

Для статистической обработки результатов исследования были применены программы IBM® SPSS® Statistics версия 25, а также PAST 4.0, в которых были реализованы современные наиболее надежные непараметрические методы статистической обработки.

Результаты исследования и их анализ. При оценке частоты привлечения медицинских специалистов к работе в составе НФ было установлено, что в большинстве случаев медицинских специалистов из ЛМО Минздрава и ФМБА России привлекали для выполнения своих обязанностей в составе НФ только для тренировок по установленному графику – 56,3 и 61,2% соответственно. Более регулярной была работа в составе НФ медицинских специалистов ФМБА России, 14,3% которых привлекали к подобной деятельности один раз в год. Обращает на себя внимание, что 37,4% специалистов ЛМО Минздрава России и 20,4% специалистов ЛМО ФМБА России, формально состоявших в нештатных формированиях, никогда не привлекали к работе в составе НФ.

По мнению авторов, закономерными выводами из этого является необходимость:

- оптимизации и интенсификации подготовки медицинских специалистов разных ведомств путем создания единой программы их подготовки и ротации с одновременным контролем качества обучения и готовности к ликвидации последствий ЧС;

- рационального использования телемедицинских технологий и общего повышения уровня информатизации процесса оказания медицинской помощи пострадавшим и больным в ЧС.

Ключевые слова: лечебные медицинские организации, ликвидации медико-санитарных последствий, медицинские специалисты, нештатные формирования, Служба медицины катастроф Минздрава России, Федеральное медико-биологическое агентство, чрезвычайные ситуации

Конфликт интересов. Авторы статьи подтверждают отсутствие конфликта интересов

Для цитирования: Овчаренко А.П., Лемешкин Р.Н., Толстошеев В.Н., Лучшев А.В. Анализ опыта работы по ликвидации медико-санитарных последствий чрезвычайных ситуаций у специалистов нештатных формирований Службы медицины катастроф Минздрава России и Федерального медико-биологического агентства // Медицина катастроф. 2023. №1. С. 9-13. <https://doi.org/10.33266/2070-1004-2023-1-9-13>

ANALYSIS OF THE EXPERIENCE OF WORK TO ELIMINATION OF MEDICAL-SANITARY CONSEQUENCES OF EMERGENCY SITUATIONS PROVIDED BY SPECIALISTS OF UNREGULAR FORMERS OF SERVICE OF DISASTER MEDICINE OF THE MINISTRY OF HEALTH OF RUSSIA AND FEDERAL MEDICAL AND BIOLOGICAL AGENCY OF RUSSIA

A.P.Ovcharenko¹, R.N.Lemeshkin¹, V.N.Tolstosheev¹, A.V.Luchshev¹

¹ Kirov Military Medical Academy of Russian Ministry of Defense, St. Petersburg, Russian Federation

Summary. Investigation purposes – to define a presence of work experience in elimination of medical-sanitary consequences of emergency situations (ES) among medical specialists of unregular formers (UF) of Service of disaster medicine (SDM) of Ministry of Health of Russia and Federal medical and biological agency of Russia (FMBA of Russia).

Materials and methods of the investigation: To provide the investigation a survey of the specialists of UF of SDM of Ministry of Health of Russia and FMBA of Russia.

206 medical specialists from medical treatment organizations (MTO) of Ministry of Health of Russia and 49 medical specialists from MTO of FMBA of Russia were involved in research.

Programs IBM® SPSS® Statistics version 25 and PAST 4.0 were used for statistic processing of investigation results. The most reliable modern non-parametric methods of statistic processing were realized in these programs. *Results of investigation and their analysis.* During assessing of frequency of medical specialists involvement in work were established that in most cases medical specialists from MTO of Ministry of Health of Russia were attracted to performance their duties in a UF only for trainings according to the schedule – 56,3 and 61,2% respectively. Specialists from FMBA of Russia worked in UF more frequently, 14,3% were attracted to this activity once a year. Notable that 37,4% of specialists of MTO of Ministry of Health of Russia and 20,4% of specialists of MTO of FMBA of Russia formally included in unregular formers were never attracted to work in UF.

According to the authors, a reasonable conclusion is a necessity of optimization and intensification of preparation of medical specialists from different departments by creation of unified program for their preparation and rotation with simultaneously control of the quality of medical treatment provision for victims and patients in case of ES.

Keywords: *elimination of medical-sanitary consequences, emergency situations, Federal Medical and Biological Agency, medical specialists, medical treatment organizations, Service of disaster medicine, unregular formers*

Conflict of interest. The authors declare no conflict of interest

For citation: *Ovcharenko A.P., Lemeshkin R.N., Tolstoshev V.N., Luchshev A.V. Analysis of the Experience of Work to Elimination of Medical-Sanitary Consequences of Emergency Situations Provided by Specialists of Unregular Formers of Service of Disaster Medicine of the Ministry of Health of Russia and Federal Medical and Biological Agency of Russia. Meditsina Katastrof = Disaster Medicine. 2023;1:9-13 (In Russ.).* <https://doi.org/10.33266/2070-1004-2023-1-9-13>

Контактная информация:

Овчаренко Александр Павлович – адъюнкт при кафедре организации здравоохранения и общественного здоровья Военно-медицинской академии им. С.М.Кирова Минобороны России

Адрес: Россия, 194044, Санкт-Петербург, ул. Академика Лебедева, д.6

Тел.: +7 (812) 667-71-18

E-mail: vmeda-nio@mil.ru

Contact information:

Aleksandr P. Ovcharenko – PhD Student, Department of Health Organization and General Health, Kirov Military Medical Academy of Russian Ministry of Defense

Address: 6, Academica Lebedeva str., St. Petersburg, 194044, Russia

Phone: +7 (812) 667-71-18

E-mail: vmeda-nio@mil.ru

Introduction

The distinctive features of emergencies (ES) are suddenness of their occurrence, destruction of social infrastructure, massive sanitary losses. The medical and sanitary consequences of emergencies are their complex characteristic. The organization of medical care for their victims is influenced by many factors of the medical situation in the emergency zone: magnitude and structure of sanitary losses; need for different types of medical care for the victims; volume of its provision; changes in the sanitary and epidemiological situation prevailing in the emergency; failure or disruption of the medical organizations of various profiles; disruption of life support in the emergency zone and the surrounding areas [1]. In these conditions there is a sharp mismatch between the acute need to provide medical care in emergency to a large number of victims and patients and to the capabilities of local health authorities, accompanied, in some cases, by complete or partial disorganization of their management system.

At present the main principle of medical and evacuation support (MES) of the victims of emergencies is stage-by-stage treatment with evacuation according to the destination. For the victims and patients in an emergency, especially those in a serious condition, the timely provision of medical care in the required volume is vital [2, 3]. The main activities in the field of protection of population and territories from emergencies are defined in the Decree of the President of the Russian Federation from January 11, 2018 № 12¹.

At the same time, the above normative legal act sets tasks for the federal executive authorities. One of the tasks is the development of functional and territorial subsystems of the Unified State System for the Prevention and Elimination of Emergency Situations (RSChS) with coordination and consolidation with other bodies and organizations. One of the main functional subsystems of RSChS is the All-Russian Dis-

aster Medicine Service (ADMS), which combines the Disaster Medicine Service (DMS) of the Ministry of Health of Russia ("National Medical and Surgical Center named after N.I.Pirogov" of the Ministry of Health of Russia); subdivisions of permanent readiness of medical and other organizations included in the DMS of the Ministry of Health of Russia; the Disaster Medicine Service of the Ministry of Defense of Russia; forces and means of the EMERCOM and the Interior Ministry of Russia, other federal executive authorities, executive authorities of subjects of the Russian Federation (hereinafter — subjects), local authorities, other organizations designed and allocated (involved) to liquidate medical and sanitary consequences of emergencies²⁻⁴.

Based on the Order of the Russian Ministry of Health "On Approval of the Procedure for Organizing and Providing Medical Aid by the All-Russian Disaster Medicine Service in Emergency Situations, Including Medical Evacuation" of November 1, 2020, the medical aid to victims of emergencies is provided by specialists of visiting emergency medical teams (EMTs), emergency response teams (ERTs), a multidisciplinary hospital, medical organizations providing

¹ Fundamentals of State Policy of the Russian Federation in the field of protection of the population and territories from emergencies for the period up to 2030: Presidential Decree of the Russian Federation of January 11, 2018 No. 12

² On the bases of health protection of citizens in the Russian Federation: Federal Law of 21.11.2011 №323-FZ (ed. of 13.07.2015, as amended on 30.09.2015) (as amended and supplemented, in force since 24.07.2015)

³ On Approval of the Regulations on the All-Russian Disaster Medicine Service: Decree of the Government of the Russian Federation No. 734 of August 26, 2013 (as amended and supplemented)

⁴ On Amending Certain Acts of the Government of the Russian Federation and Recognizing the Decree of the Government of the Russian Federation No. 420 of May 3, 1994 as no longer in force: Decree of the Government of the Russian Federation No. 1671 of October 12, 2020

assistance in outpatient and inpatient conditions, as well as staff and non-staff formations (hospitals, detachments, brigades, groups), which in the event of an emergency come under the operational control of the emergency medical services management authorities of the corresponding level. To eliminate medical and sanitary consequences of emergencies on the basis of different medical organizations, as well as of medical organizations performing and providing state sanitary and epidemiological supervision, on all levels of the Disaster Medicine Service non-staff formations (NF) are created.

In the process of NF creation and planning of their activities on liquidation of medical and sanitary consequences of emergencies the organizational and staff structure of medical organizations, level of medical specialists training, as well as possibility of medical organizations to work after sending brigades (groups) to the place of liquidation of medical and sanitary consequences of emergency [4] must be taken into account.

The organization and efficiency of activities to eliminate medical and sanitary consequences of emergencies are determined by professional competencies and qualifications of medical specialists, and to a large extent depend on the coordination of interaction between all participants of the elimination of the consequences of emergencies, often belonging to different departments. Thus, in order to improve the effectiveness of the activities on purpose during the elimination of medical and sanitary consequences of emergencies, it is relevant to study the experience of such activities of medical specialists from the NF of different departments.

The aim of the study is to estimate the experience of the medical specialists from the non-staff units of the Disaster Medicine Service of the Ministry of Health of Russia and the Federal Medical and Biological Agency (FMBA) of Russia in liquidating the medical and sanitary consequences of the emergency situations and to analyze their special features: frequency of emergency medical aid, experience in mass casualty acceptance, participation in medical triage and organization of medical and biological treatment in the emergency situations.

Materials and research methods. The study was based on a questionnaire study of the specialists of the NFs of the DMS of the Ministry of Health and of the Federal Medical and Biological Agency.

The study included 206 medical specialists who are employees of medical organizations of the Russian Ministry of Health and 49 medical specialists of medical organizations of the Russian Federal Medical and Biological Agency. Each of the respondents voluntarily consented to the processing of their personal data contained in the questionnaire in accordance with the procedure established by Russian Federation legislation on personal data — Federal Law "On Personal Data" dated July 27, 2006 № 152-FZ. The study was approved by an independent Ethics Committee.

For statistical processing of the results of the study we used programs IBM® SPSS® Statistics version 25, as well as PAST 4.0, in which the most reliable nonparametric methods of statistical processing were implemented [5]. The normality of the distribution of the study groups was assessed using the Shapiro-Wilk and Anderson-Darling criteria. Normally distributed continuous data were presented as mean (M) and standard deviation (SD); categorical data were presented as units and percentages (fractions). Significance of differences between groups of variables compared for continuous data was assessed using nonparametric Mann-Whitney U-test for independent groups. The significance of dif-

ferences between groups of categorical data was determined using the χ^2 criterion. Differences were considered statistically significant at p values < 0.05 .

Results of the study and their analysis. When assessing the frequency of involvement of medical specialists in the NF, it was found that in most cases medical specialists from medical institutions of the Ministry of Health and FMBA of Russia were involved in performing their duties in the NF only for training according to the established schedule — 56.3% and 61.2% respectively. The work of FMBA medical specialists in the NF was more regular, 14.3% of whom were involved in such activities once a year. It is noteworthy that 37.4% of the specialists from medical organizations of the Russian Ministry of Health and 20.4% of the specialists from medical organizations of FMBA of Russia were never involved in the NF, although they were formally part of it (Table 1).

The medical specialists who had work experience in the emergency zone gave reliable answers to the questions characterizing the provision of medical care to a large number of victims. Thus, among medical specialists from medical organizations of the Russian Ministry of Health, only 13.6% were involved in providing medical aid in conditions of mass influx of victims and patients. The proportion of specialists from medical organizations of the Federal Medical and Biological Agency of Russia who had similar experience was significantly higher — 38.8%; $p < 0.001$. Similar differences between medical specialists from different departments were obtained with regard to their participation in the medical triage of the wounded and sick, as well as in the organization of the medical evacuation. Thus, respondents from medical specialists of the Russian Ministry of Health took part in medical triage in 17.5% of cases; followed by medical evacuation in 21.5% of cases. Medical specialists of the Russian Federal Medical and Biological Agency carried out the above activities in 46.9% and 42.9% of cases, respectively, $p < 0.001$.

The vast majority of NF specialists (87.9% from the medical organizations of the RF Ministry of Health and 81.6% from the medical organizations of Federal Medical-Biological Agency) did not use telemedicine technologies (Table 2).

In 2020 in the Russian Federation 4.3 thousand medical brigades were engaged to eliminate the medical and sanitary consequences of emergencies, and practically all of these brigades, which provided medical aid to victims in the pre-hospital period, belonged to the DMS of the subjects of the Russian Federation [4, 6, 7]. The effective activity of NFs of different departments (hospitals, squads, brigades, groups) is impossible without feedback, which is the task of our study. Lack of regular professional activity on destination in the course of liquidation of medical and sanitary consequences of emergency, little or no experience in the focus of emergency have a negative impact on the continuity and consistency of medical and evacuation support activities for the victims and patients.

The statistically significant distinctions revealed by us in frequency of involvement of medical workers of Ministry of Defense of different departments testify to necessity of activation in this direction first of all — in medical organizations of the Ministry of Health of Russia. Also very depressing is the picture when more than one third of the medical specialists from the Defense Ministry of the Ministry of Health of Russia and one fifth of the employees of the Defense Ministry of the Federal Medical and Biological Agency of Russia have never been involved in the activities of the NF on liquidation of medical and sanitary consequences of emergencies.

Частота привлечения медицинских специалистов в составе НФ к работе по ликвидации медико-санитарных последствий ЧС, чел./%

Frequency of involvement of specialists as a part of non-regular formations for elimination of healthcare consequences of emergency situations, people/%

Частота привлечения Frequency of involvement	Медицинские специалисты из состава МО Минздрава России Medical specialists of medical organizations of the Ministry of Health of Russia, n=206	Медицинские специалисты из состава МО ФМБА России Medical specialists of medical organizations of the Federal Medical and Biological Agency of Russia, n=49	P
1 раз в 12 мес / 1 time in 12 months	5/2,4	7/14,3	< 0,01
1 раз в 6 мес / 1 time in 6 months	3/1,50	1/2,0	< 0,01
1 раз в 3 мес / 1 time in 3 months	5/2,4	1/2,0	< 0,01
Только для тренировок по установленному графику Only for trainings according to schedule	116/56,3	30/61,2	< 0,01
Не привлекались / Was not involved	77/37,4	10/20,4	< 0,01

Примечание. МО –медицинские организации
Note. MO –medical organizations

A natural consequence of this situation is the difference in the participation in medical triage and medical evacuation between the Ministry of Health and the Federal Medical and Biological Agency of Russia, the latter having participated in these activities 2.7 and 2 times more frequently than medical specialists from the Ministry of Health of Russia.

This situation inevitably leads to a decrease in the professional level of medical specialists and the deterioration of the effectiveness of medical care in emergencies. The solution to this problem can be the creation of a unified program for attracting medical specialists to work in the NF with the possibility of rotation between departments, strict monitoring of all aspects of their activities, as well as the exclusion of a medical specialist from the list of participants in the elimination of medical and sanitary consequences of emergencies in case of his refusal to participate in the extended training program. For more frequent involvement of medical specialists in the NF of DMS of the Russian Ministry of Defense it is necessary to actively promote at the regional and federal levels the use of available forces and means of medical service of the Armed Forces of the Russian Federation in joint actions of all federal executive bodies intended for liquidation of medico-sanitary consequences of emergencies [8].

The small proportion of telemedicine consultations (TMC) may indicate both the lack of a generally accepted approach to discussing the tactics of managing "complex" pa-

tients by a multidisciplinary team of specialized specialists, and the overall low level of informatization, while the process of organizing and technically supporting TMC is complex and time-consuming. The solution to this problem will be to increase the overall level of informatization — providing medical specialists with personal automated workstations with the possibility of video conferencing, the introduction of medical information systems and archives to store and transmit medical images, while regularly monitoring this process by professionals of specialized agencies, where informatization is at a significantly higher level. In addition to improving the quality of medical care due to the involvement of leading specialists through TMC and virtual rounds, improved informatization will provide more analytical data on the features of laboratory and instrumental diagnosis, treatment of patients, efficiency of spending time, material resources, bed fund and then, based on this information, will enable to optimize the process of elimination of medical and sanitary consequences of emergencies.

Thus, medical specialists from the NF formed in the medical institutions of the Ministry of Health and FMBA of Russia performed their professional duties in the NF only in the emergency mode and have experience in the mass admission of victims in an emergency, but they rarely use telemedical technologies.

According to the authors, the conclusions from this are the necessity of:

Таблица 2 / Table No. 2

Частота использования телемедицинских технологий медицинскими специалистами в составе нештатных формирований, чел./%

Frequency of telemedical technologies usage by medical specialists as a part of non-regular formation, people/%

Использование телемедицинских технологий - ТМТ Usage of telemedical technologies –TT	Медицинские специалисты из состава МО Минздрава России Medical specialists of medical organizations of the Ministry of Health of Russia, n=206	Медицинские специалисты из состава МО ФМБА России Medical specialists of medical organizations of the Federal Medical and Biological Agency of Russia, n=49	P
Получали рекомендации по оказанию медицинской помощи /Got recommendations about provision of medical care	19/9,2	8/16,3	> 0,05
Использовали ТМТ в качестве врача- консультанта / Used TT as a medical consultant	6/2,9	1/2,0	> 0,05
Не использовали ТМТ / Did not used TT	181/87,9	40/81,6	> 0,05

Примечание. МО –медицинские организации
Note. MO –medical organizations

- optimization and intensification of training of medical specialists by creating a unified program of training and rotation of medical specialists from different departments with simultaneous quality control of their training and readiness;

- rational use of telemedicine technologies and general increase of informatization level of the process of medical aid rendering to victims and patients in emergencies.

СПИСОК ИСТОЧНИКОВ

1. Теряев В.Г. Медицина чрезвычайных ситуаций. М., 2014. 496 с.
2. Агаджанян В.В. Политравма: проблемы и практические вопросы // Политравма. 2006. №1. С. 5-8.
3. Бойко И.В., Зафт В.Б., Лазаренко Г.О. Организация экстренной медицинской помощи пострадавшим с политравмой на этапах медицинской эвакуации // Медицина неотложных состояний. 2013. № 2. С. 77-84.
4. Гончаров С.Ф., Быстров С.Ф., Баранова Н.Н. и др. Мобильные медицинские формирования Службы медицины катастроф Министерства здравоохранения Российской Федерации // Медицина катастроф. 2019. № 3. С. 5-11.
5. Hammer O., Harper D.A.T., Ryan P.D. PAST: Paleontological Statistics Software Package for Education and Data Analysis // Palaeontologia Electronica. 2001. T.4, № 1. С. 1-9.
6. Гончаров С.Ф., Титов И.Г., Бобий Б.В., Акиншин А.В. Основные итоги деятельности Всероссийского центра медицины катастроф «Защита» ФМБА России в 2020 г. и задачи на 2021 год // Медицина катастроф. 2021. № 1. С. 10-17.
7. Тхохова З.М. Перспективы развития и совершенствования инициативы ВОЗ по созданию медицинских бригад чрезвычайного реагирования // Московская медицина. 2019. № 4. С. 87-88.
8. Дмитриев Г.В., Лемешкин Р.Н., Блинов В.А., Чувашев М.Л. Подготовка военно-медицинских специалистов в области управления медицинским обеспечением войск (сил) в рамках учебной дисциплины «Медицина чрезвычайных ситуаций» // История военного образования в медицинских вузах: Мат-лы Всероссийской науч.-практич. конф. с международным участием. Ростов-на-Дону, 2018. С. 132-136.

REFERENCES

1. Teryayev V.G. *Meditsina Chrezvychaynykh Situatsiy* = Medicine of Emergencies. Moscow Publ., 2014. 496 p. (In Russ.).
2. Agadzhanian V.V. Polytrauma: Problems and Practical Issues. *Politravma* = Polytrauma. 2006;1:5-8 (In Russ.).
3. Boyko I.V., Zaft V.B., Lazarenko G.O. Organization of Emergency Medical Care for Patients with Polytrauma at the Stages of Medical Evacuation. *Meditsina Neotlozhnykh Sostoyaniy*. 2013;2:77-84 (In Ukr.).
4. Goncharov S.F., Bystrov M.V., Baranova N.N., et al. Mobile Medical Formations of Service for Disaster Medicine of Ministry of Health of Russian Federation. *Meditsina Katastrof* = Disaster Medicine. 2019;3:5-11 (In Russ.).
5. Hammer O., Harper D.A.T., Ryan P.D. PAST: Paleontological Statistics Software Package for Education and Data Analysis. *Palaeontologia Electronica*. 2001;4:1:1-9.
6. Goncharov S.F., Titov I.G., Bobiy B.V., Akin'shin A.V. Main Results of Activities of All-Russian Centre for Disaster Medicine Zashchita of Federal Medical Biological Agency in 2020 and Tasks for 2021. *Meditsina Katastrof* = Disaster Medicine. 2021;1:10-17 (In Russ.).
7. Tkikhova Z.M. Prospects for the Development and Improvement of the WHO Initiative to Create Emergency Medical Teams. *Moskovskaya Meditsina*. 2019;4:87-88 (In Russ.).
8. Dmitriyev G.V., Lemeshkin R.N., Blinov V.A., Chuvashov M.L. Training of Military Medical Specialists in the Field of Managing the Medical Support of Troops (Forces) Within the Framework of the Discipline "Emergency Medicine". *Istoriya Voen'nogo Obrazovaniya v Meditsinskikh Vuzakh* = History of Military Education in Medical Universities. Materials of the All-Russian Scientific and Practical. Conf. with International Participation. *Rostov-na-Donu Publ.*, 2018. P. 132-136 (In Russ.).

ВНИМАНИЮ ЧИТАТЕЛЕЙ ЖУРНАЛА «МЕДИЦИНА КАТАСТРОФ»!

Подписной индекс журнала в каталоге «Пресса России» – 18269.

С 2022 г. в почтовых отделениях связи
подписка на журнал не принимается.

Оформить подписку на журнал можно в интернет-каталоге
«Пресса России» на сайтах:
www.pressa-rf.ru и www.akc.ru (агентство «Книга-сервис»).
Подписка оформляется с любого номера журнала

Материал поступил в редакцию 06.09.22; статья принята после рецензирования 20.01.23; статья принята к публикации 23.03.23
The material was received 06.09.22; the article after peer review procedure 20.01.23; the Editorial Board accepted the article for publication 23.03.23