

STANDARD OPTIONS FOR CREATING A GROUPING OF MEDICAL FORCES AND MEANS IN THE ORGANIZATION OF MEDICAL AND EVACUATION SUPPORT FOR THE VICTIMS OF A TERRORIST ATTACK

I.G.Titov¹, S.F.Goncharov^{1,2}, B.V.Bobiy^{1,2}, A.V.Akinshin¹

¹ State Research Center – Burnasyan Federal Medical Biophysical Center of Federal Medical Biological Agency, Moscow, Russian Federation

² Russian Medical Academy of Continuing Professional Education, Moscow, Russian Federation

Abstract. *The objectives of the study are:* to analyze the experience of organizing medical assistance and medical evacuation of victims during terrorist acts committed with the use of conventional means of destruction; to determine standard options for creating a group of medical forces and means, their possible composition and the main tasks to be solved in the implementation of medical and evacuation support.

Materials and research methods. Materials of the research: normative and methodical documents regulating the order of medical aid rendering and carrying out medical evacuation of wounded at acts of terrorism; reports of territorial disaster medicine centers on liquidation of medical and sanitary consequences of acts of terrorism classified as emergencies; data of expert evaluation maps on the research theme; scientific works and publications devoted to the organization of medical aid rendering and of carrying out medical evacuation.

The following scientific methods were applied: content-analysis, expert estimation, logic and information modeling, analytical method.

Research results and their analysis. The results of the study of the basic principles of creating a grouping of medical forces and means intended to provide medical assistance and evacuation of victims of terrorist acts with the use of conventional means of destruction are presented.

Substantiated propositions on creation of standard variants of echelon grouping of medical forces and means at liquidation of medical and sanitary consequences of terrorist acts were made; composition of medical forces and means, included in each echelon of the grouping, and their main tasks were defined.

The results of the research have shown that medical organizers and specialists of the Disaster Medicine Service of the Russian Ministry of Health experience difficulties when creating and determining the order of functioning of a group of medical forces and means involved in medical and evacuation support of injured, especially during large-scale terrorist attacks. It is conditioned by: insufficient knowledge of peculiarities of modern terrorist acts and of factors, influencing the organization of medical aid and medical evacuation; insufficient practical experience of medical specialists; shortcomings in generalization of experience of public health management bodies, medical organizations and formations, participating in liquidation of consequences of such emergency situations; imperfection of normative and methodical base.

Key words: *echelon of medical forces and means, emergencies, grouping of medical forces and facilities, medical and evacuation support, medical formations, medical organizations, public health authorities, regional centers of emergency and disaster medicine, system of organization of medical aid and medical evacuation, territorial disaster medicine centers, terrorist acts, victims*

Conflict of interest. The authors declare no conflict of interest

For citation: Titov I.G., Goncharov S.F., Bobiy B.V., Akinshin A.V. Standard Options for Creating a Grouping of Medical Forces and Means in the Organization of Medical and Evacuation Support for the Victims of a Terrorist Attack. *Meditsina Katastrof = Disaster Medicine.* 2022;1:20-30 (In Russ.). <https://doi.org/10.33266/2070-1004-2022-1-20-30>

ТИПОВЫЕ ВАРИАНТЫ СОЗДАНИЯ ГРУППИРОВКИ МЕДИЦИНСКИХ СИЛ И СРЕДСТВ ПРИ ОРГАНИЗАЦИИ ЛЕЧЕБНО-ЭВАКУАЦИОННОГО ОБЕСПЕЧЕНИЯ ПОРАЖЁННЫХ В РЕЗУЛЬТАТЕ ТЕРРОРИСТИЧЕСКОГО АКТА

И.Г.Титов¹, С.Ф.Гончаров^{1,2}, Б.В.Бобий^{1,2}, А.В.Акиншин¹

¹ ФГБУ «ГНЦ – Федеральный медицинский биофизический центр им. А.И.Бурназяна» ФМБА России, Москва, Россия

² ФГБОУ ДПО «Российская медицинская академия непрерывного профессионального образования» Минздрава России, Москва, Россия

Резюме. *Цели исследования –* изучить и проанализировать опыт организации оказания медицинской помощи и проведения медицинской эвакуации пораженных при террористических актах (терактах), совершенных с применением обычных средств поражения; определить типовые варианты создаваемой группировки медицинских сил и средств, их возможный состав и основные задачи, решаемые при осуществлении лечебно-эвакуационного обеспечения пораженных. *Материалы и методы исследования.* Материалы исследования: нормативные и методические документы, регламентирующие порядок оказания медицинской помощи и проведения медицинской эвакуации пораженных при террористических актах; донесения и отчеты территориальных центров медицины катастроф (ТЦМК) о ликвидации медико-санитарных последствий терактов, классифицируемых как чрезвычайные ситуации (ЧС); данные карт экспертной оценки по теме исследования; научные работы и публикации, посвященные организационным технологиям оказания медицинской помощи и проведения медицинской эвакуации пораженных при терактах.

При выполнении исследования применялись следующие научные методы: метод контент-анализа, метод экспертной оценки, логическое и информационное моделирование, аналитический метод.

Результаты исследования и их анализ. Представлены результаты исследования основных принципов создания группировки медицинских сил и средств, предназначенной для оказания медицинской помощи и проведения медицинской эвакуации пораженных при террористических актах с применением обычных средств поражения.

Внесены обоснованные предложения по созданию типовых вариантов эшелонированной группировки медицинских сил и средств при ликвидации медико-санитарных последствий терактов; определены состав медицинских сил и средств, входящих в каждый эшелон группировки, и возлагаемые на них основные задачи.

Результаты исследования показали, что врачи-организаторы и специалисты Службы медицины катастроф (СМК) Минздрава России часто испытывают затруднения при создании и определении порядка функционирования группировки медицинских сил и средств, привлекаемой для лечебно-эвакуационного обеспечения пораженных, особенно – при крупномасштабных терактах. Это обусловлено: недостаточным знанием особенностей совершения современных терактов и действующих при этом факторов, влияющих на организацию оказания медицинской помощи и проведения медицинской эвакуации; отсутствием достаточного практического опыта у соответствующих медицинских специалистов; недостатками в обобщении опыта работы органов управления здравоохранением, медицинских организаций и формирований, участвовавших в ликвидации последствий таких ЧС; несовершенством нормативной и методической базы по исследуемому вопросу.

Ключевые слова: группировка медицинских сил и средств, лечебно-эвакуационное обеспечение, лечебные медицинские организации, медицинские формирования, органы управления здравоохранением, пораженные, региональные центры скорой медицинской помощи и медицины катастроф, система организации оказания медицинской помощи и проведения медицинской эвакуации, территориальные центры медицины катастроф, террористические акты, чрезвычайные ситуации, эшелон медицинских сил и средств

Конфликт интересов. Авторы статьи подтверждают отсутствие конфликта интересов

Для цитирования: Титов И.Г., Гончаров С.Ф., Бобий Б.В., Акиншин А.В. Типовые варианты создания группировки медицинских сил и средств при организации лечебно-эвакуационного обеспечения пораженных в результате террористического акта // Медицина катастроф. 2022. №1. С. 20-30. <https://doi.org/10.33266/2070-1004-2022-1-20-30>

Contact information:

Boris V. Bobiy – Dr. Sci. (Med.), Deputy Chief of Control Center of ARCDM «Zachshita» of Burnazyan FMBC
Address: 46, Zhivopisnaya street, Moscow, 123098, Russia
Phone: +7 (495) 942-45-48
E-mail: orgplan@vcmk.ru

Контактная информация:

Бобий Борис Васильевич – докт. мед. наук, зам. рук. Центра упр. и метод. обеспеч. деят. ВЦМК «Защита» ФМБЦ им. А.И.Бурназяна
Адрес: Россия, 123098, Москва, ул. Живописная, 46
Тел.: +7 (495) 942-45-48
E-mail: orgplan@vcmk.ru

The experience of liquidation of medical and sanitary consequences of acts of terrorism, especially of those accompanied by a great number of wounded, by capture and detention of hostages with the threat to their lives; the contents of the scientific works and publications devoted to the organization of medical aid and medical evacuation of the wounded during the attacks show that one of the first-rate organization measures is the determination or specification (if it was done beforehand based on the forecasted data) of the medical care and evacuation of the wounded.

The following must be taken into account: the number and structure of the wounded; the location of medical treatment facilities, especially hospitals, and their ability to provide medical aid to the wounded, to deal with traumas and diseases; number and location of: mobile medical formations, ambulance teams and the Disaster Medicine Service; number and condition of medical evacuation routes from the emergency area (a list of means of transportation, medical evacuation, and location of the medical evacuation routes).

In connection with the stated above attention should be paid to the fact that the officials, making decisions on the liquidation of medical and sanitary consequences of terrorist acts, and the specialists of Disaster Medicine Service developing proposals to support such decisions, must be competent and trained professionally and methodologically in the issues of creating an appropriate group of medical forces and means. Compliance with this requirement is also due to the fact that as a rule, terrorist acts result in rapid emergencies, rate of spread of which often does not allow to give an adequate assessment of the situation and in which a high-preparedness mode is not introduced. It is known that within the time frame of this mode of operation

there should be opportunities for some kind of preparatory activities.

The study and analysis of normative and methodological documents of the Ministry of Health of Russia, scientific works and other literature sources have shown that so far that there is practically no scientifically described and systematized technology of creating a group of medical forces and means and definition of tasks assigned to it during the implementation of complex medical and evacuation measures to liquidate medical and sanitary consequences of terrorist attacks^{1,2}.

These circumstances required a scientific study, using the method of retrospective analysis, of topical issues of the technology of creation and functioning of a group of medical forces and facilities designed to save lives and preserve health of victims of terrorist attacks.

The above emphasizes the relevance of the results of the study presented in this article and their relevance to practical health care.

At first glance it may seem that the article is overloaded with information. However, from the methodological point of view, it is done intentionally in order to give a more complete description of the system of possible options for grouping medical forces and facilities, to define their typical tasks and composition, which, in the authors' opinion, will eventually contribute to a more objective understanding of the

¹ Procedure for the organization and provision of medical aid in emergency situations, including medical evacuation by the All-Russian Disaster Medicine Service of: Approved by Order of the Ministry of Health of the Russian Federation of November 6, 2020, No. 1202n

² Procedure for the provision of emergency, including specialized emergency medical care: Approved by Order of the Ministry of Health of Russia from June 20, 2013 No. 388n

organization of medical and evacuation support of the victims of terrorist attacks.

The authors understand that the presented typical variants of the grouping of medical forces and means will not always fully correspond to such groupings created in practice, because the grouping elements and tasks of its echelons will largely depend on the number and structure of the contingent of the injured, on specific conditions affecting the organization of their medical and evacuation support.

We consider it necessary to draw attention of specialists in disaster medicine to the fact that the concept of "creation of group of medical forces and means" should not be understood literally — as the creation of new medical organizations and formations. It concerns mainly the existing and functioning in the real situation specific formations and subdivisions, public health authorities and other medical organizations involved in the liquidation of medical and sanitary consequences of the terrorist attacks.

The aim of the study is to determine the typical variants of the created group of medical forces and means, their possible structure and the main tasks to be solved by the medical and evacuation support of the wounded by terrorist acts with the use of the conventional means of destruction on the basis of the study and analysis of the experience of medical aid organization and carrying out medical evacuation of the wounded.

Materials and research methods. Materials: normative and methodical documents regulating the organization of medical aid and medical evacuation of the wounded at acts of terrorism; reports and accounts of territorial centers of disaster medicine on liquidation of medical and sanitary consequences of acts of terrorism classified as emergencies; data of expert evaluation maps on the topic of research; scientific works and publications devoted to the organizational technologies of medical aid and medical evacuation of the wounded.

Research methods: content analysis method, method of expert estimation, logical and informational modeling and analytical method.

Research results and their analysis. The research of state of the problem question, concerning the order of creation and functioning of the grouping of medical forces of means, intended for rendering medical aid and carrying out medical evacuation of victims at acts of terrorism, first of all of large scale ones, has shown that quite often there are difficulties at its practical solution. In this regard, it became necessary to identify the causes of this situation. It turned out that this is connected mainly not only with the peculiarities of terrorist acts, with the conditions in which they were committed, and the factors influencing the organization of medical aid and the medical evacuation of the wounded, but also — to a large extent — with the lack of sufficient practical experience of specialists of health care administration, medical organizations and formations involved in the liquidation of medical and sanitary consequences of various terrorist acts, and shortcomings in its generalization.

To a certain extent, this situation is confirmed by the results of the examination of the regulatory and methodological documents on the organization of medical and evacuation support of the population affected by terrorist acts, which are in effect in healthcare as part of this study. The following results were obtained in the analysis of expert evaluations: 6.1% of experts believed that the cur-

rent official documents allow "fully" to organize medical and evacuation support; 72.3 — only "partially"; 15.9 — "do not allow"; 5.7% of experts found it difficult to give a specific assessment of the state of the regulatory and methodological base, which regulates such an important direction in healthcare activity.

The results of the assessment of the state of the regulatory and methodological framework on this issue indicate the need to take measures for its development and improvement, coordinated with the general set of activities carried out within the framework of counter-terrorism. In addition, such a provision obliges the heads of authorities and medical organizations to bring the provisions of these documents to the relevant medical specialists in a timely manner and monitor their knowledge.

Some scientific works and other sources have already discussed the issues of grouping medical forces and facilities in response to the medical and sanitary consequences of emergencies to a certain extent [5-8]. At the same time, there is reason to believe that some of the provisions set out in them do not sufficiently generalize the experience of the organization of medical care and the medical evacuation of the injured specifically in terrorist attacks, which does not create a holistic view of these issues and thereby does not allow more substantiated practical recommendations to be developed³⁻⁵.

It should be noted that in the normative, methodological and other documents of the Russian Ministry of Health the term "grouping of forces and means" is practically never used. At the same time, in other subsystems of the Unified State System of Emergency Prevention and Response, including the Ministry of Emergency Situations and the Ministry of Defense of Russia, this concept is used quite widely^{6,7}.

In view of this, we consider it necessary to give a definition of this concept in relation to medical forces and means. According to the authors, it is the most successful and complete and reflects its essence.

A group of medical forces and facilities should be understood as organizationally, functionally and territorially united in a particular system of various health care management bodies, medical units and formations, medical organizations involved to perform specific tasks of medical and evacuation support of the affected during a terrorist attack.

In the course of the study it was found that the creation of a group of medical forces and means should be initiated in advance based on the forecast of medical and sanitary consequences for stationary objects — railway stations, airports, shopping and cultural and entertainment centers, stadiums and other facilities where activities involving a large number of people, objects with a high risk of danger

³ Documents from the emergency situation with hostage-taking in the Palace of Culture "Nord-Ost" / Case No 11-04/20 VTSMC "Protection" of the Ministry of Health of the Russian Federation, 2002. 258 p.

⁴ Documents from the emergency situation, the terrorist act in Beslan / Case #11-04/21 "Zashchita" Disaster Medicine Center of the Ministry of Health of Russia, 2004. 522 p.

⁵ Documents on the emergency situation — the terrorist act in the Moscow metro / Case #11-04/53 VSMC "Protection" of the Ministry of Health of Russia, 2010. 155 p.

⁶ Grazhdanskaya Zashchita = Civil Protection. Encyclopedia in 4 volumes. Ed. Puchkov V.A. Vol. 1 (A-I). Moscow, FGBU VNII GO CHS(FTS) Publ. P. 391 (In Russ.).

⁷ Melnichenko P.I., Popov V.I. Entsiklopedicheskiy Slovar Voenno-Profilakticheskikh Terminov = Encyclopedic Dictionary of Military-Prophylactic Terms. Voronezh, Izdatel'stvo-Poligraficheskiy Tsentr "Nauchnaya Kniga" Publ., 2016. P. 140-141 (In Russ.).

to the population, etc., and then finally — in the decision to eliminate medical and sanitary consequences of the attack. Consequently, the grouping of medical forces and means should be created in relation to the specific emergency conditioned by an act of terrorism. This methodical approach should probably be seen as a necessary condition for creating a potentially and functionally stable system of medical and evacuation support for the victims of terrorist attacks.

The main conditions that affect the formation of such a grouping of medical forces and means are presented in the authors' article [9].

It should be emphasized that the determination of possible variants of creating a grouping of medical forces and means to eliminate the medical and sanitary consequences of terrorist acts will take place in the conditions of formation and functioning on the territory of subjects of the Russian Federation (hereinafter - subjects) of a three-tier system of organization of medical aid to population, medical districts, interregional medical centers and regional centers of emergency and disaster medicine — [10].

In the course of the study, the question naturally arose — what medical forces and facilities can be part of such a grouping? While studying and analyzing, using the method of expert evaluation, the experience of liquidation of medical and sanitary consequences of terrorist acts, especially large-scale ones, it was established that, except for medical treatment organizations, the created group of medical forces and means, a variant of the system of organization of medical aid and medical evacuation of victims of terrorist acts, should include first of all: EMTs; emergency response teams of the Regional Center of Emergency and Disaster Medicine.

From the results of the research and the content of the concept of "grouping of medical forces and facilities" it is clear that its elements may have unequal, even intradepartmental (Ministry of Health of Russia) affiliation — include forces and facilities not only of the regional and federal level health care, but also subordinate to other fed-

eral bodies of executive power (Table). For example, during the terrorist attack in the St. Petersburg metro (2017) almost 20.0% of the injured, who needed medical care in hospital conditions, were sent to the clinic of the S.M. Kirov Military Medical Academy of the Ministry of Health of the Russian Federation [11].

Such cases of liquidation of the consequences of terrorist attacks require a clear organization of dispatching the wounded, interagency cooperation (military-civilian cooperation) and coordination of medical forces and means involved in providing medical assistance and conducting the medical evacuation of the wounded.

Apparently, we can agree that in order to study, to analyze the results of the study and to clearly distinguish the location and deployment of medical forces and means involved in the elimination of the medical and sanitary consequences of terrorist acts; for their purpose and procedure of application, it is appropriate to use the term "echeloned grouping of medical forces and means".

Obviously, in this case, the concepts of "echelon" and "grouping" of medical forces and means, located on a separate territory (area) and designed to solve the specific tasks, coincide in essence. At the same time, it does not exclude the expediency of introducing the concept of "echelon", which implies the presence of a unified holistic (multilevel) health care system, carrying out the liquidation of medical and sanitary consequences of a single terrorist attack.

The study of the experience of liquidation of medical and sanitary consequences of the terrorist attacks showed that during the organization of the medical care for the affected people the medical care was provided by the specialists of the EMT and Disaster Medicine teams, including the Field Multidisciplinary Hospital of the "Zaschita" All-Russian Disaster Medicine Center, teams of the regional and federal level. Consequently, the creation of the system should be based on the availability of various options for the use of medical forces and facilities included in the medical constellation.

Таблица / Table

Распределение пораженных при теракте в метро по лечебным медицинским организациям Санкт-Петербурга (2017) – [18]

Distribution of injured in the subway terrorist attack among medical treatment organizations in St. Petersburg (2017) – [18]

Травмоцентр / Trauma center	Расстояние от места теракта до ЛМО, км / Distance from the place of the terrorist attack to the medical treatment organisation, km	Число пораженных, поступивших в ЛМО, чел. / Number of affected admitted to the medical treatment organisation, people.	в том числе пораженных в тяжелом состоянии / including those in severe condition
Городская Мариинская больница / Mariinskaya City Hospital	3,0	11	3
Детский городской многопрофильный клинический центр высоких медицинских технологий им. К.А.Раухфуса / Children's City Multidisciplinary Clinical Center of High Medical Technologies named after K.A. Rauchfuss	3,7	1	–
Военно-медицинская академия им. С.М.Кирова Минобороны России / Military Medical Academy named after S.M.Kirov of the Ministry of Defense of Russia	5,8	7	3
НИИ скорой помощи им. И.И.Джанелидзе / I.I.Dzhanelidze Research Institute of Emergency Medicine	7,0	14	4
Городская больница №26 / City Hospital No. 26	8,6	3	–
Всего / Total		36	10

On the basis of the results of the research of the issues of the methodology of the creation of the grouping of medical forces and means, 3 main variants of the grouping were developed in relation to the organization of the liquidation of medical and sanitary consequences of terrorist acts, which are to a great extent typical. The main criteria determining the creation of this or that typical variant of grouping are: the place of the terrorist attack — within a large city; in a suburban area — at a distance of 100 km from the city; at a considerable distance from medical organisations of the 2nd and 3rd levels or in rural areas; the number of casualties requiring, first of all, medical care in hospital conditions; the structure of the casualty contingent, the capability of medical organisations of the region where the attack has occurred, to provide medical care, treatment and medical evacuation of the casualties.

In studying the procedure for liquidating the medical and sanitary consequences of terrorist attacks it was found that if as a result of such emergencies there is a significant number of victims (as a rule — more than 150), in need of specialized, including high-tech, medical care in hospital, medical organisations often not able to provide all the victims the necessary medical care in full in optimal time and to provide complete treatment. Therefore, in order to eliminate the medical and sanitary consequences of such a terrorist attack, it is necessary to create an appropriate version of the group with the involvement of medical forces and means not only of the regional, but also of the federal level of healthcare with a certain number of elements and echelons included in its composition.

In the course of this study such a variant of grouping of medical forces and means was developed in relation to a large-scale terrorist act (explosion of a house, hotel, administrative building, cultural or shopping center, stadium, transport vehicle — passenger train, plane, bus — located at a considerable distance from the medical organisation of the 1st — 3rd level, etc.) or terrorist act with a great number of hostages and a threat to their lives and possibility of operation of mobile medical forces in the focus (on the border of the focus) of emergency (Fig. 1). The terrorist act of capturing and keeping hostages in Beslan is a convincing evidence of the possibility of committing such terrorist acts and creating a group of medical forces and means for liquidating their medical and sanitary consequences (Fig. 2). As a rule, to eliminate the medical and sanitary consequences of such terrorist acts requires quite a long time, which will be spent on searching for and releasing injured people from under rubble, collapsed buildings, damaged vehicles, and negotiating with terrorists who have taken hostages.

The first echelon of this grouping of medical forces and means is located within the area/area of the terrorist attack. Its typical composition is advisable to include: ambulance and emergency medical teams; a task force of specialists from the regional health authority, regional or territorial centers of disaster medicine; ambulances (reanimobiles) and other vehicles; medical stations, including a point (office or equipped room) for medical and psychological assistance. In addition, in some cases the first echelon of the group may include a mobile medical unit, an aviation mobile medical complex; a task force of the Ministry of Health of Russia.

Attention should be paid to the following requirement, which must be met in the first echelon of medical forces and

means — in the area of a large-scale terrorist attack it is necessary to have an additional fund of medical stretchers and — depending on the air temperature — means for warming the injured (blankets, sleeping bags, etc.), which are acquired and stored in advance in the property reserve at the emergency rescue organizations of the Ministry of Emergency of Russia, designed for emergency response, and are delivered to the emergency zone.

The analysis of real work of medical specialists during liquidation of consequences of terrorist acts, scientific works and publications on the problem under study, as well as the results of modeling of organization of medical aid rendering and carrying out of medical evacuation of the injured during solution of thematic situation tasks and trainings with virtual usage of forces and means of health-care, included into the first echelon of the group, allowed to formulate the following main tasks, which are advisable to entrust the forces and means of this echelon

- organizing and conducting medical triage of the wounded in order to identify those in need of emergency medical assistance provided in the area of the terrorist attack;

- determining the procedure for medical evacuation (the order of evacuation, destination medical organisation, type of transport and method of evacuation);

- providing emergency medical assistance to the wounded — mainly in an emergency form — and preparing them for medical evacuation to the medical organisation;

- medical evacuation of casualties from the terrorist attack zone to the medical organisation, in accordance with the principles of routing and taking into account the medical and tactical situation and the functioning system for organizing the medical evacuation of casualties requiring hospital care;

- providing medical assistance to members of emergency teams involved in the response to the terrorist attack;

- medical and psychological assistance to the wounded, participants in rescue operations and others;

- coordinate the activities of medical teams and mobile medical formations working in the terrorist attack zone/area;

- control over the arrival and activities of mobile medical formations, medical teams working in the terrorist attack zone, carried out by the operational management team;

- presenting information on the health situation in the terrorist attack zone/area to the appropriate medical institutions by the command and control unit;

- interaction with management bodies, subdivisions and formations of other ministries, services and organizations acting as part of the first echelon of the overall group of forces and means involved in the response to the terrorist attack, to agree on joint activities to ensure timely medical assistance and the medical evacuation of the injured from the terrorist attack zone/area to medical treatment organizations (trauma centers).

As the results of the study have shown, the second echelon of the grouping should mainly include: regional medical organisations of the 1st — 3rd level, including trauma centers involved in the elimination of medical and sanitary consequences of a terrorist attack, as well as federal medical treatment organizations, stationed on the territory of the region; teams of specialized medical care of regional and federal level medical organisations; clinics; regional emergency and disaster medicine centers; sanitary transport,

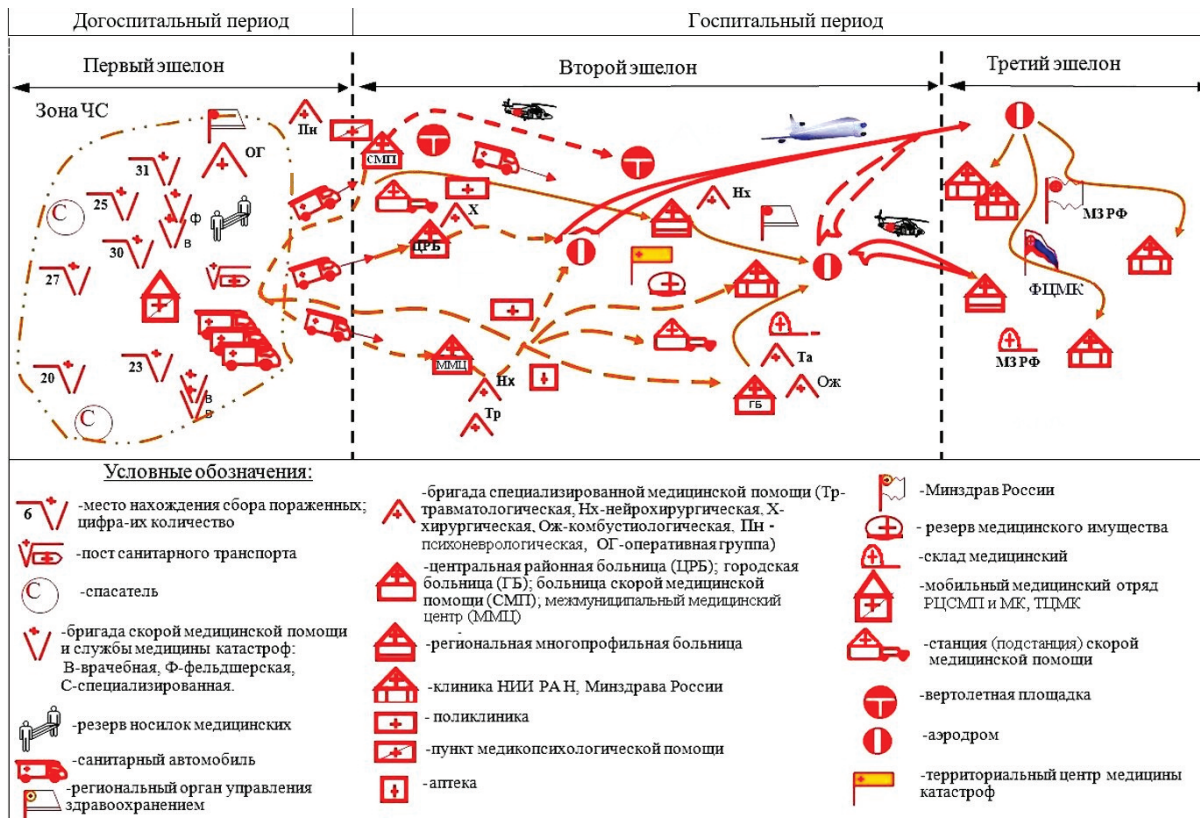


Рис. 1. Принципиальная схема организации лечебно-эвакуационного обеспечения пораженных в результате крупномасштабного теракта с применением обычных средств поражения

Fig. 1. Principle scheme of organization of medical evacuation support of the wounded in a large-scale terrorist attack with the use of conventional means of destruction

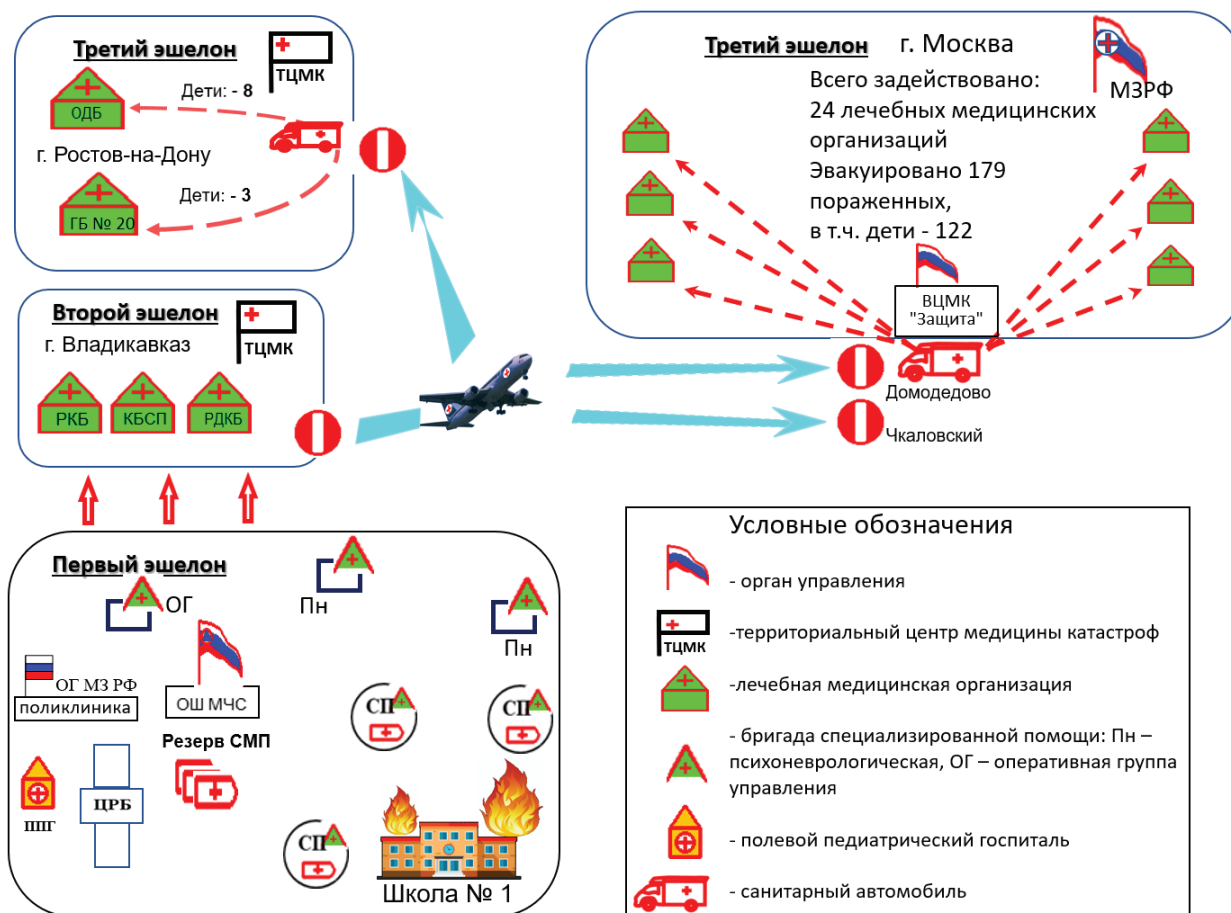


Рис. 2. Схема лечебно-эвакуационного обеспечения пораженных в результате террористического акта в г. Беслане (на 11 сентября 2004 г.)

Fig. 2. Scheme of medical evacuation support of the wounded in the act of terrorism in Beslan (as of September 11, 2004).

including sanitary and aviation, means, reserve of medicines.

It is reasonable to assign the following most important tasks for elimination of medical and sanitary consequences of terrorist attacks to the specialists of medical organizations of the second echelon, as evidenced by the results of the study:

- clarification (development) of the plan of medical and evacuation support of the victims of the terrorist attack;
- provision of specialized, including high-tech, medical care, as well as, in some cases, emergency medical care, including specialized emergency medical care, during the admission of the wounded and primary medical care for those in need of outpatient treatment;
- selection and referral to federal medical treatment centers (organizations) and medical organisations in other regions for treatment of patients with the most complex pathologies;
- coordination of issues concerning the order of referral and medical evacuation of the wounded to regional and federal medical treatment organizations;
- organization of inter-hospital transfers of the injured; preparation of the injured for medical evacuation and its implementation;
- selection and deployment of medical specialists to work in medical organisations involved in the elimination of the medical and sanitary consequences of the terrorist attack;
- organization and implementation of uninterrupted supply of medicines and necessary medical equipment to medical formations, units and organizations of the first and second echelons, providing medical assistance and carrying out medical evacuation of the wounded;
- management of medical organizations, subdivisions and formations called in to provide medical assistance and the medical evacuation of the wounded, and also the coordination of the activities of specialized medical assistance teams from federal medical treatment organizations arriving and working on the basis of hospital facilities;
- interaction with the relevant regional and territorial administrations of the Federal Security Service, the Ministry of Internal Affairs, the Ministry of Emergency Situations and the Ministry of Defense and with other services and organizations involved in the response to the terrorist act in order to provide timely medical assistance and medical evacuation of the wounded.

A specific feature of the grouping of medical forces and means of the first and second echelons is that they are territorially located within the borders of the subject where the terrorist attack took place. Thus, medical organizations and health care of the region as a whole bear the main load and responsibility for elimination of medical and sanitary consequences of the terrorist attack. Consequently, such an organizational decision to implement medical support of the victims of the terrorist attack fully complies with the provisions specifying responsibility and order of liquidation of the emergency consequences, which were regulated by the Government Decree of the Russian Federation dated December 30, 2003 No. 794⁸.

⁸ On the Unified State System of Prevention and Liquidation of Emergency Situations. The Decree of the Government of the Russian Federation dated December 30, 2003, No. 794 (as amended on 26.01.2017) (In Russ.).

An analysis of the experience of organizing medical and evacuation support for the victims of large-scale emergencies caused by terrorist attacks suggests that the group of medical forces and facilities often has to create a third echelon, which is represented mainly by medical organisations of the federal level [8]. This echelon, as a rule, includes: multidisciplinary and specialized medical organisations, medical centers and research organizations with clinics subordinated to the Ministry of Health of Russia and the RAS; reserve of specialized beds, located in the above medical organisations; reserve of medical equipment of the Ministry of Health of Russia for emergency response; Federal Medical Center of the Federal State Budgetary Institution N.I. Pirogov Medical and Surgical Center; Federal Medical Center for Emergency Medicine; Russian Ministry of Health (Commission for Emergency Prevention and Response and Fire Safety) and, if necessary, other federal medical organizations. In addition, in some cases the third echelon may include multidisciplinary or specialized medical organisations located on the territory of neighboring subjects [8]. Thus, during the elimination of the medical and sanitary consequences of the terrorist attack in Beslan (2004), 11 victims (all children) were evacuated by air to Rostov-on-Don.

The study analyzed and summarized the experience of federal medical treatment organizations and public health authorities in organizing and providing medical care and medical evacuation of the wounded during the liquidation of, first of all, large-scale terrorist attacks. The results obtained made it possible to formulate the main tasks to be performed by the third echelon of medical forces and means:

- provision of specialized, including high-tech, medical care to the injured with the most complex pathology (wounds, combined trauma and polytrauma);
- selection and dispatching of the operative management group, mobile medical formations and individual specialists from federal health care authorities, from N.I. Pirogov Federal Medical and Surgical Center and medical treatment organizations subordinate to the Russian Ministry of Health and the RAS to work in the medical and evacuation support for the injured, functioning within the territory of the region where the terrorist attack took place;
- participation in the selection of patients in need of specialized, including high-tech, medical care from among the wounded who are hospitalized in the region, for their transfer to federal medical organisations for treatment;
- organizing and conducting medical evacuation of the wounded — mainly by air transport — from medical organisations of the region to the federal medical treatment facilities (sometimes — to the regional medical organisations of other subjects);
- organizing the dispatch of the necessary medical equipment to ensure the uninterrupted operation of medical treatment organizations, medical formations, participating in the liquidation of the medical and sanitary consequences of the terrorist attack;
- Ministry of Health and N.I. Pirogov Federal Medical and Surgical Center as authorized to manage and coordinate the activities of mobile medical teams, medical treatment teams, and other medical organizations involved in the medical care and medical evacuation of the victims of the terrorist attack;

- organization of interaction with federal executive bodies, management bodies of the subsystems taking part in the response to the terrorist attack, in order to effectively implement measures of medical treatment of the wounded.

As can be seen, a significant part of the tasks performed by this echelon of the group does not belong to the category of managerial tasks alone.

The results of the study showed that almost all (98.7%) experts were in full agreement with the proposals on the composition and tasks assigned to the corresponding echelons of the standard versions of the grouping of medical forces and means created to provide medical aid and conduct medical evacuation of the injured in acts of terrorism. Only 1.3% of the experts had difficulty formulating a specific conclusion on these problematic issues. It turned out that these experts included medical specialists who were either not involved in, or had little experience in, organizing the medical and sanitary consequences of emergencies, including terrorist attacks. At the same time, as a rule, they had little experience in the health care management bodies, in the service of the emergency medical services. This situation, naturally, requires appropriate measures to improve the professional training of these persons in disaster medicine.

During the study it was found that the above described variant of the system (scheme) of organization of medical care in large-scale terrorist attacks as applied to such cities as Moscow and St. Petersburg, where there are head and large medical organisations, centers subordinated to city health care, as well as federal medical treatment facilities (clinics, centers, research institutes, including RAS), in which specialized, including high-tech, medical care is provided, can hardly be considered typical. This provision has been repeatedly confirmed by the practice of eliminating the medical and sanitary consequences of such terrorist attacks as Nord-Ost (Moscow, 2002), in the St. Petersburg metro (2017), and at other sites in these cities - Fig. 3 [11].

In such cases, the system of medical care for victims of a terrorist attack may include a grouping of medical forces and means, consisting, as a rule, of two echelons (Fig. 4). The first echelon of such a grouping fully corresponds to the first echelon of the above-described version of the standard scheme of organization of the medical care. The situation with the second echelon of the grouping is quite different. It is represented by medical organisations, which, depending on their distance from the terrorist attack zone and their ability to provide the necessary medical care to the wounded in view of the available pathology, may be segregated and thus form separate echelons in the city. This solution for establishing and operating a grouping of medical forces and resources makes it possible, as a rule, to send the casualties in an extremely grave or serious condition to the nearest terrorist attack zone, and those in a moderately grave condition to more distant medical organisations. An important role is played by the organization and implementation of clear and continuous monitoring of: the number of casualties in the terrorist attack zone; the structure of the contingent of casualties and their need for medical care; the availability of free hospital beds of the required profile; the readiness of the medical organisations to receive and to provide medical care to the casualties; the routing of the casualties.

It should be noted that in the case of terrorist attacks in the above and some other cities (Nizhny Novgorod, Kazan, Yekaterinburg, Novosibirsk, etc.), where there is a developed network of medical organisations, which have great opportunities for providing specialized, including high-tech, medical care, the emergency medical services will have a high level of readiness and equipped with medical transport, including air ambulances, which creates more favorable conditions for the implementation of the routing principles of the affected. The affected people can be immediately sent to medical organisations, where, as a rule, they will be provided with comprehensive medical care and full treatment before the onset of the outcome. Consequently, the transfer of casualties from one medical treatment organization to another is unlikely, and inter-hospital medical evacuation is practically unnecessary due to the effective application of the above-mentioned monitoring and rapid preparation of hospital beds in the respective medical organisations.

At the given variant of organization of medical support, except medical treatment organizations, composition of the second echelon of group, as a rule, will include: center of disaster medicine, ambulance station; polyclinics; sanitary transport, including sanitary helicopter; reserve of medicines and medical equipment for liquidation of medical and sanitary consequences of emergency, contained at center of disaster medicine and in organizations of medical equipment supply; management body of city health care.

Depending on the situation, the second echelon of the grouping may also include other medical organizations.

It should be noted that in the event of terrorist attacks in these cities the system of medical and evacuation support for the wounded and, consequently, the grouping of medical forces and facilities will be located within one city (Moscow, St. Petersburg, etc.). Naturally, such a situation makes it possible to solve problems on forming a group of medical forces and means, on managing the involved medical organisations and medical formations, including more effective implementation of the necessary interaction, to achieve better results in saving lives and preserving the health of the affected people.

The study has shown that in terrorist acts accompanied by a small number of casualties in need of medical care in hospital, and if there is a regional health care system that is able to provide the necessary medical care to the casualties in full within the optimal time frame and their treatment based on the existing pathology, the basic scheme of the organization of the medical aid will be somewhat different than in large-scale acts of terrorism. In this regard, the composition of the created group of medical forces and means involved in the liquidation of medical and sanitary consequences of terrorist attacks will be mainly focused on the regional level of healthcare (Fig. 5).

It is necessary to pay attention to two principal provisions. The first is that the system of medical and evacuation support for the victims of such terrorist attacks is territorially located within the borders of a particular subject. The second is that the period of liquidation of medical and sanitary consequences of these terrorist attacks, as a rule, is not long [9]. Except for those cases, when as a result of terrorist act there is considerable destruction of buildings and at that time is required for removal of rubble in order to find and release the affected people.

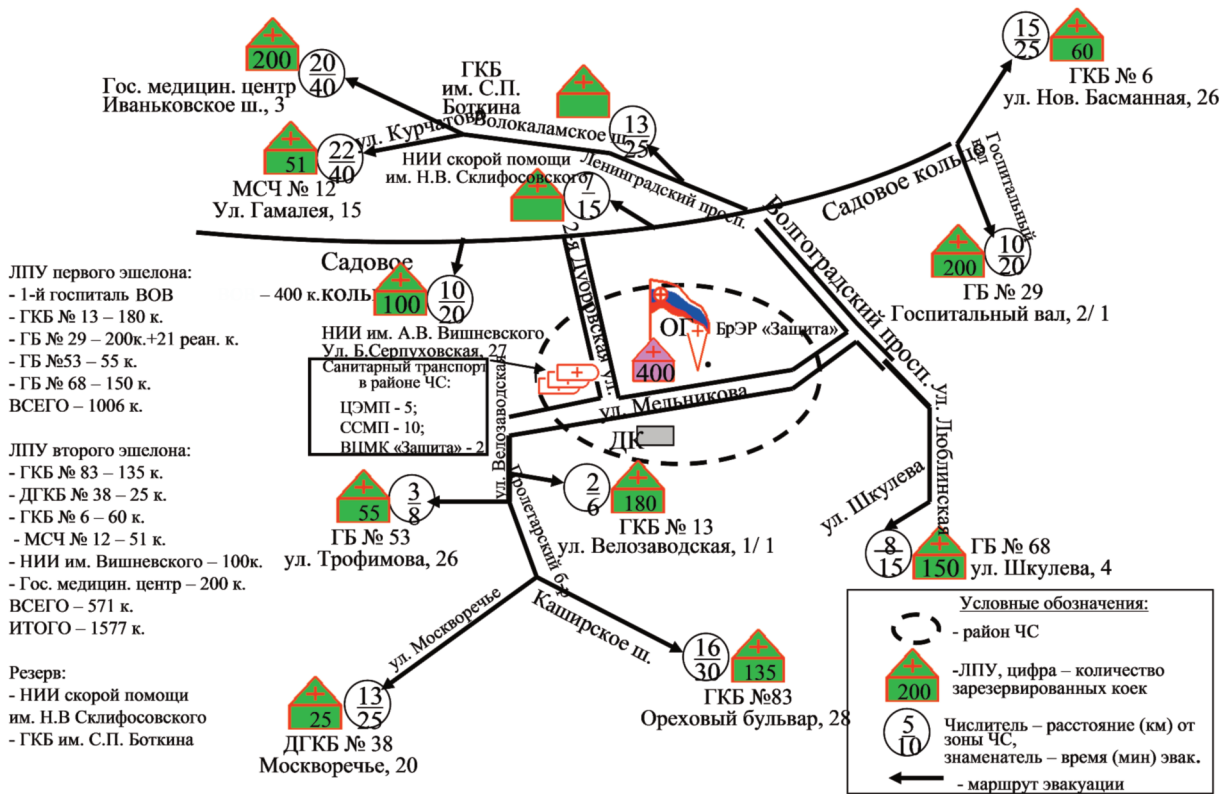


Рис. 3. Схема организации лечебно-эвакуационного обеспечения пораженных при теракте в культурно-развлекательном центре шарикоподшипникового завода (Москва, октябрь 2002 г.)
Fig. 3. Scheme of the organization of medical evacuation support of the wounded in the act of terrorism in the cultural-entertaining center of the ball bearing factory (Moscow, October, 2002)

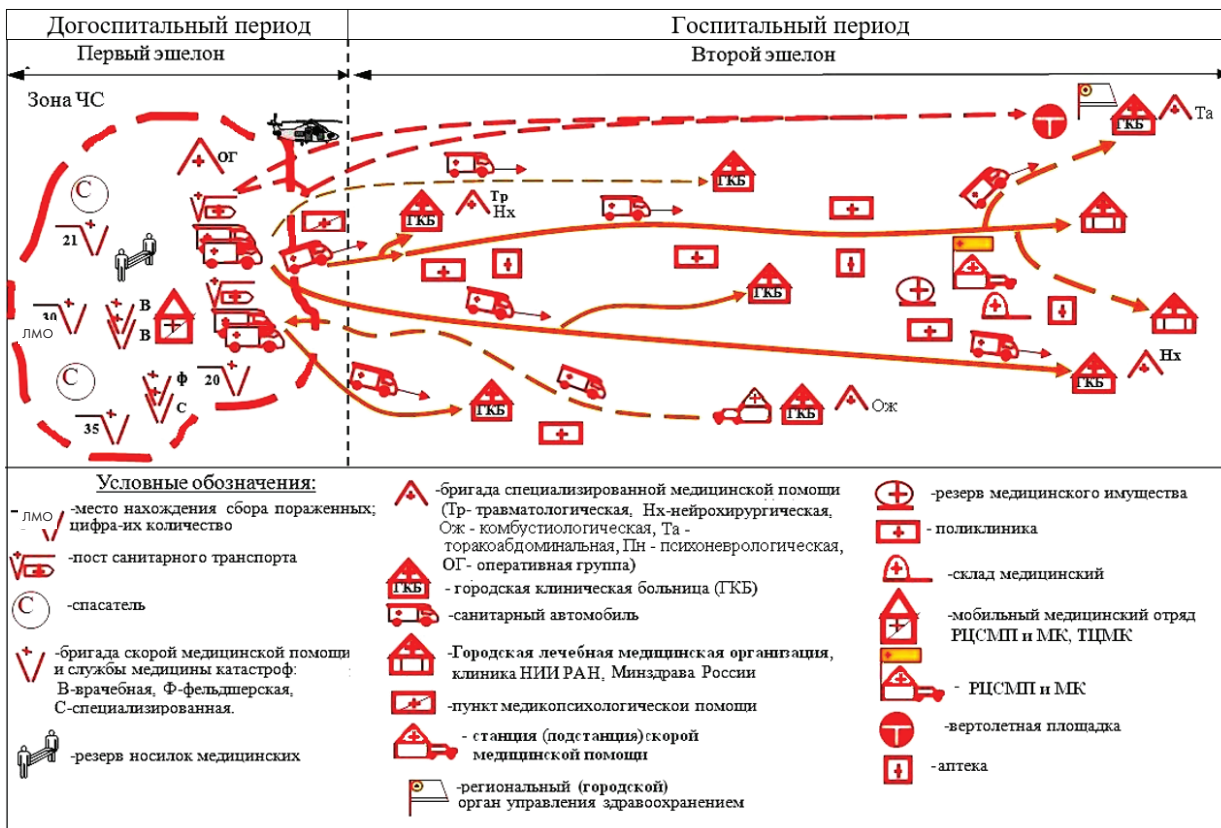


Рис. 4. Принципиальная схема организации лечебно-эвакуационного обеспечения пораженных при теракте, совершенном в мегаполисе с применением обычных средств поражения
Fig. 4. Schematic diagram of the organization of medical evacuation support of the wounded in a terrorist attack committed in a megapolis with the use of conventional means of destruction

In such terrorist attacks the first echelon of the group of medical forces and facilities performs the same tasks as a similar echelon of the group created to eliminate the medical and sanitary consequences of large-scale terrorist attacks.

In this case the composition of the first echelon is advisable to include: ambulance teams; reanimobiles, if available — ambulance helicopter; operational group of the health management body, consisting mainly of specialists from regional and territorial disaster medicine centers (according to the situation). In addition, at the beginning of the liquidation of medical and sanitary consequences of the terrorist attack it is reasonable to entrust the tasks solved by the operative management group to one of the best prepared teams which first arrived at the site of the event.

Since the terms of elimination of medical and sanitary consequences of these terrorist attacks are not so long, this situation virtually eliminates the need to deploy a medical and psychological aid station near the emergency area.

All of the above makes it possible to formulate the following conclusion, which has an important practical value. The created grouping of medical forces and facilities for liquidation of medico-sanitary consequences of terrorist acts of municipal and regional scale with use of conventional means of destruction includes, as a rule, two echelons which solve practically the same tasks as similar echelons of grouping of medical forces and facilities created during large scale terrorist acts. Their main difference is that the echelons will not include medical forces and means of the federal level stationed outside the region.

Conclusions

1. The study has shown that one of the basic requirements to be met in establishing an echelon group of medical forces

and facilities is to ensure the provision of all kinds of medical aid to the wounded in a terrorist attack, an uninterrupted supply of medical equipment to the medical formations and organizations involved in the liquidation of the medical and sanitary consequences of the terrorist attack and the management of these medical forces and facilities.

2. In view of the above, attention should be paid to several very important organizational provisions concerning the echelons of the grouping of medical forces and means, created when eliminating the medical and sanitary consequences of terrorist attacks:

2.1 The location of stationary medical organisations and placement of mobile medical formations, sanitary transport, management bodies and other medical organizations on the relevant territory, the order of their use determines the need for an organizational system of medical assistance and medical evacuation of victims of terrorist attacks on the relevant territory. In addition, the specified organizational system must be comprehensive in nature and be in its composition an optimal grouping of health care forces and means.

2.2 Depending on the specific conditions, the system of medical and evacuation support for the wounded as a result of a terrorist attack (grouping of medical forces and means) may consist of several echelons, which mainly solve problems peculiar to them alone.

2.3 The echelons of the grouping of medical forces and facilities may be located not only in one, but also in several subjects of the Russian Federation, which necessitates the participation of relevant specialists and structural subdivisions of the Russian Ministry of Health in the response to the medical and sanitary consequences of such a terrorist attack.

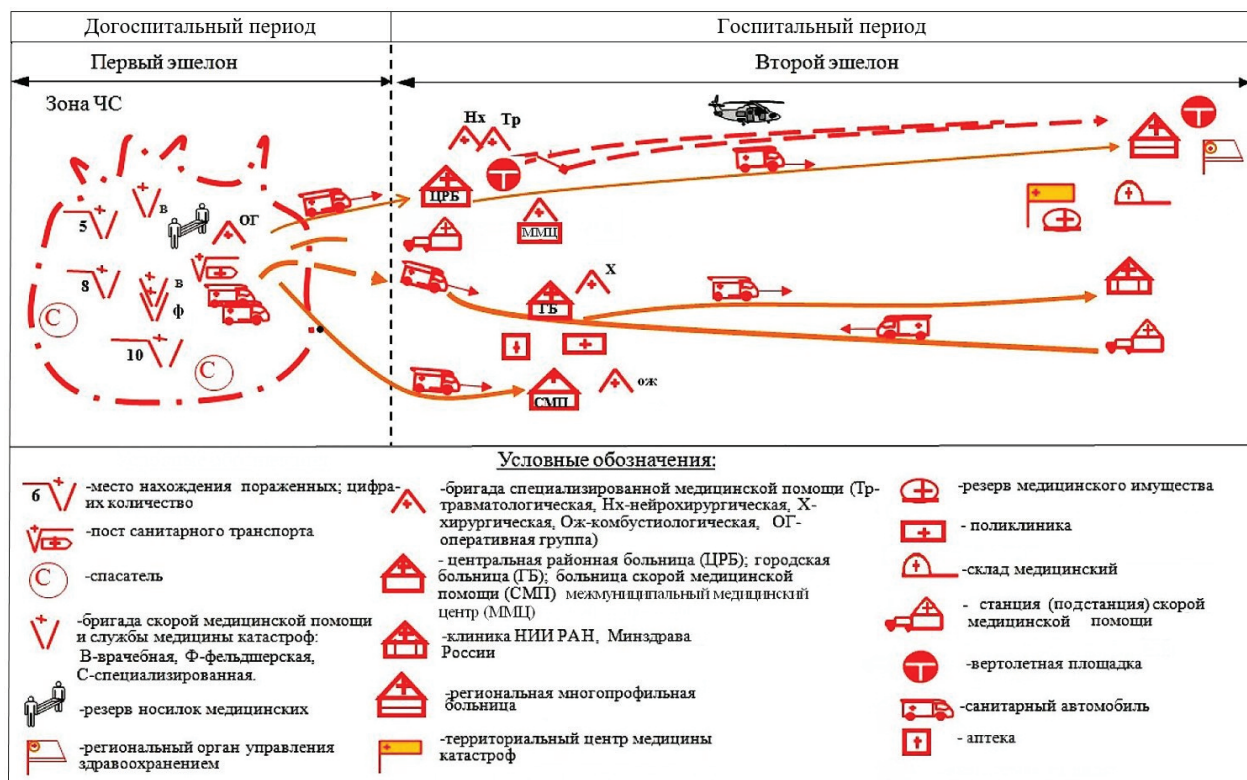


Рис. 5. Принципиальная схема организации лечебно-эвакуационного обеспечения пораженных при теракте муниципального или регионального масштаба, совершенном с применением обычных средств поражения (вариант)
 Fig. 5. Principle scheme of organization of medical evacuation support of the wounded in an act of terrorism of municipal or regional scale, committed with the use of conventional means of destruction (variant)

2.4 The medical forces and means included in the echelon of the grouping may be subordinate to different levels of health care (the Ministry of Health of Russia), sometimes to other ministries and organizations, which requires the organization of clear interaction and coordination of their actions.

2.5 The echelon of medical forces and means involved in the elimination of the medical and sanitary consequences of a terrorist attack should be considered a forced measure in the general system of organization and provision of medical care and the medical evacuation of the wounded.

REFERENCES

1. *Obshchestvennoye Zdorovye i Zdravookhraneniye. Natsionalnoye Rukovodstvo* = Public Health and Healthcare. National Leadership. Ed. Starodubov V.I., Shchepin O.P., et al. Moscow, GEOTAR-Media Publ., 2013. P. 390-407 (In Russ.).
2. *Osnovy organizatsii okazaniya meditsinskoy pomoshchi postradavshim pri chrezvychaynykh situatsiyakh* = Fundamentals of Organizing the Provision of Medical Care to Victims of Emergency Situations. A Manual for Doctors. Moscow, VTSMK Zashchita Publ., 2017. 98 p. (In Russ.).
3. *Meditsina Chrezvychaynykh Situatsiy* = Emergency Medicine. Ed. Goncharov S.F., Fisun A.Ya. Textbook in 2 volumes. Moscow, GEOTAR-Media Publ., 2021. V.2. P. 246-281 (In Russ.).
4. Goncharov S.F., Bobiy B.V., Titov I.G., Akin'shin A.V., Samoylova M.S. Some Issues of Optimizing Management Activities in Organizing Provision of Medical Care to Victims of Terrorist Acts. *Meditsina Katastrof* = Disaster Medicine. 2021;2:29-34. <https://doi.org/10.33266/2070-1004-2021-2-29-34> (In Russ.).
5. *Meditsinskoye Obespecheniye Naseleniya pri Terroristicheskikh Akтах* = Medical Support of the Population during Terrorist Acts. A manual for doctors. Moscow, VTSMK Zashchita Publ., 2016. 79 p. (In Russ.).
6. Onishchenko G.G., Goncharov S.F., Bobiy B.V. *Opyt Organizatsii Mediko-Sanitarnogo Obespecheniya Naseleniya i Vosstanovleniya Zdravookhraneniya Chechenskoy Respubliki Formirovaniyami i Uchrezhdeniyami Minzdrava Rossii (1999-2000 gg.)* = Experience in Organizing Medical and Sanitary Provision of the Population and Restoring Healthcare in the Chechen Republic by Formations and Institutions of the Ministry of Health of Russia (1999-2000). Moscow, VTSMK Zashchita Publ., 2002. 552 p. (In Russ.).
7. Bobiy B.V. Groupings of Forces and Means of Health Care for Medical and Sanitary Support of the Population of the Chechen Republic. *Meditsina Katastrof* = Disaster Medicine. 2001;1:9-13 (In Russ.).
8. Goncharov S.F., Kryukov A.P., Kryukov V.I., et al. Organization of Medical Support for the Victims of the Terrorist Act in Beslan on September 3, 2004. *Meditsina Katastrof* = Disaster Medicine. 2004;3-4:1-3 (In Russ.).
9. Bobiy B.V., Goncharov S.F., Titov I.G. Main Conditions and Factors Affecting the Organization of Medical Care Delivery and Medical Evacuation in Terrorist Acts Involving Explosive Devices and Conventional Weapons. *Meditsina Katastrof* = Disaster Medicine. 2020;4:16-27. <https://doi.org/10.33266/2070-1004-2020-4-16-27> (In Russ.).
10. Bystrov M.V. Analysis of Organizational Models of Disaster Medicine Service of the Ministry of Health of the Russian Federation at Regional Level. *Meditsina Katastrof* = Disaster Medicine. 2021;4:5-10. <https://doi.org/10.33266/2070-1004-2021-4-5-10>. (In Russ.).
11. Fisun A.Ya., Samokhvalov I.M., Boykov A.A., Parfenov V.Ye., Badalov V.I., Kipor G.V. Liquidation of Medical and Sanitary Consequences of Terrorist Act: Event's Chronology and Clinic of Injuries. *Meditsina Katastrof* = Disaster Medicine. 2018;2:22-24 (In Russ.).

3. The implementation of the proposed approaches to the order of creation and functioning of the echeloned grouping of medical forces and means, designed for medical and evacuation support of the victims of terrorist acts, may create conditions for a more reasonable, rational and effective use of medical organizations and formations, sanitary transport, public health authorities in order to achieve better results in saving lives and health of victims and minimize medical and sanitary evacuations.

СПИСОК ИСТОЧНИКОВ

1. Общественное здоровье и здравоохранение. Национальное руководство / Под ред. Стародубова В.И., Щепина О.П. и др. М.: ГЭОТАР-Медиа, 2013. С. 390-407.
2. Основы организации оказания медицинской помощи пострадавшим при чрезвычайных ситуациях: Учебное пособие для врачей. М.: ФГБУ ВЦМК «Защита», 2017. 98 с. (Библиотека Всероссийской службы медицины катастроф).
3. Медицина чрезвычайных ситуаций: Учебник: в 2 т. / Под ред. Гончарова С.Ф., Фисун А.Я. М.: ГЭОТАР-Медиа, 2021. Т.2. С. 246-281.
4. Гончаров С.Ф., Бобий Б.В., Титов И.Г., Акиншин А.В., Самойлова М.С. Некоторые вопросы оптимизации управленческой деятельности при организации оказания медицинской помощи пострадавшим в результате террористических актов // Медицина катастроф. 2021. №2. С. 29-34. <https://doi.org/10.33266/2070-1004-2021-2-29-34>.
5. Медицинское обеспечение населения при террористических актах: Учебное пособие для врачей. М.: ФГБУ ВЦМК «Защита», 2016. 79 с. (Библиотека Всероссийской службы медицины катастроф).
6. Онищенко Г.Г., Гончаров С.Ф., Бобий Б.В. Опыт организации медико-санитарного обеспечения населения и восстановления здравоохранения Чеченской Республики формированиями и учреждениями Минздрава России (1999-2000 гг.). М.: ВЦМК «Защита», 2002. 552с.
7. Бобий Б.В. Группировки сил и средств здравоохранения для медико-санитарного обеспечения населения Чеченской Республики // Медицина катастроф. 2001. №1. С.9-13.
8. Гончаров С.Ф., Крюков А.П., Крюков В.И. и др. Организация медицинского обеспечения пораженных при террористическом акте в г.Беслан 3 сентября 2004 г. // Медицина катастроф. 2004. №3-4. С. 1-3.
9. Бобий Б.В., Гончаров С.Ф., Титов И.Г. Основные условия и факторы, влияющие на организацию оказания медицинской помощи и проведения медицинской эвакуации при террористических актах с применением взрывных устройств и обычных средств поражения // Медицина катастроф. 2020. №4. С. 16-27. <https://doi.org/10.33266/2070-1004-2020-4-16-27>.
10. Быстров М.В. Анализ организационных моделей функционирования Службы медицины катастроф Министерства здравоохранения Российской Федерации на региональном уровне // Медицина катастроф. 2021. №4. С. 5-10. <https://doi.org/10.33266/2070-1004-2021-4-5-10>.
11. Фисун А.Я., Самохвалов И.М., Бойков А.А., Парфенов В.Е., Бадалов В.И., Кипор Г.В. Ликвидация медико-санитарных последствий террористического акта: хронология события и клиника пораженных // Медицина катастроф. 2018. №2. С. 22-24.