

ОКАЗАНИЕ МЕДИЦИНСКОЙ ПОМОЩИ БОЛЬНЫМ И ПОСТРАДАВШИМ С ИСПОЛЬЗОВАНИЕМ САНИТАРНОЙ АВИАЦИИ В РЕСПУБЛИКЕ КРЫМ

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Резюме. Цель исследования – оценка работы специалистов авиамедицинских бригад (АМБр) территориального центра медицины катастроф (ТЦМК) Республики Крым по проведению санитарно-авиационной эвакуации и оказанию экстренной консультативной медицинской помощи (ЭКМП) больным и пострадавшим в чрезвычайных ситуациях (ЧС).

Материалы и методы исследования. Материалы исследования – служебная документация о работе отделения экстренной консультативной медицинской помощи и медицинской эвакуации (ЭКМП и МЭ) территориального центра медицины катастроф Республики Крым в 2019–2021 гг. Методы исследования – аналитический и статистический.

Результаты исследования и их анализ. Отмечено, что санитарно-авиационная эвакуация больных и пострадавших в ЧС в Республике Крым осуществляется на вертолёте «Ансат» штатной авиамедицинской бригадой реанимационного профиля с привлечением – в случае необходимости – других специалистов.

Представлены итоги работы санитарной авиации Республики Крым в 2019–2021 гг.

По результатам исследования внесены предложения по улучшению качества проведения санитарно-авиационной эвакуации. Среди них: организация краткосрочных курсов по ознакомлению членов АМБр с основами авиационной медицины, авиационной эргономики и психофизиологии деятельности лётных экипажей; обучение лётного экипажа (пилот, штурман) основам проведения санитарно-авиационной эвакуации; проведение «на земле» с нештатными членами АМБр инструкторских занятий и тренажей по правилам эксплуатации бортового медицинского оборудования и др.

Ключевые слова: авиамедицинская бригада, больные, отделение экстренной консультативной медицинской помощи и медицинской эвакуации, пострадавшие, Республика Крым, санитарная авиация, санитарно-авиационная эвакуация, территориальный центр медицины катастроф, чрезвычайные ситуации

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PROVISION OF MEDICAL ASSISTANCE TO PATIENTS AND INJURED WITH THE USE OF AIR AMBULANCE IN THE REPUBLIC OF CRIMEA

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Summary. The aim of the study is to evaluate the work of aviation medical teams of the Territorial Disaster Medicine Center of the Republic of Crimea in the field of sanitary aviation evacuation and rendering emergency consultative medical aid to the patients and victims of emergencies.

Materials and research methods. Materials of the study – service documentation on the work of the department of the emergency consultative medical aid of the territorial disaster medicine center of the Republic of Crimea in 2019-2021. Research methods - analytical and statistical.

Results of the study and their analysis. Sanitary aviation evacuation of patients and victims of emergencies in the Republic of Crimea is performed on the Ansat helicopter by a full-time aviation medical team of resuscitation profile with attraction – if it is necessary – of other specialists. The results of the work of the sanitary aviation of the Republic of Crimea in 2019-2021 are presented.

Based on the results of the study, proposals were made to improve the quality of air ambulance evacuations. Among them: organization of short-term courses on acquainting aviation medical teams members with basics of aviation medicine, aviation ergonomics and psychophysiology of flight crews' activity; training of flight crew (pilot, navigator) in basics of air ambulance evacuation; conducting "on the ground" with non-members of aviation medical teams instructional lessons and trainings on the rules of airborne medical equipment operation, etc.

Key words: air ambulance, air ambulance evacuation, aviation medical team, emergencies, emergency consultative medical aid and medical evacuation department, patients, Republic of Crimea, Territorial Disaster Medicine Center, victims

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Introduction

The principles of emergency medical aid to the patients and victims in emergency situations are based on the general provisions of the system of public health protection and emergency medical aid [1, 2]. In our country in the framework of the Federal project "Development of primary health care system", including such indicators as the share of persons hospitalized for emergency indications during the first day, in the total number of patients to whom flights were performed, as well as the number of persons (patients) additionally evacuated using sanitary aviation, activities to develop sanitary aviation are successfully implemented [3]. Currently, at the federal level the medical aviation evacuations of the citizens of the Russian Federation are carried out by the National Medical and Surgical Center named after N.I. Pirogov of the Ministry of Health of Russia, at the regional level in the Republic of Crimea since 2017 – by the Crimean Republican Center for Disaster Medicine and Emergency Medical Care (hereinafter – Territorial Center for Disaster Medicine). In the whole country air ambulance evacuations are performed using different types of domestic and foreign-made aircraft, 70-80% of which are helicopters.

Flights are associated with certain risks that may arise during the operation of aviation equipment [4]. At the same time, no guideline documents provide for special training of medical personnel involved in emergency medical assistance, the operation of air ambulance aircraft, the study of the characteristics of aircrew members in standard and abnormal (emergency) situations, as well as the basics of aviation hygiene, including the impact of flight factors on the human body.

The object of the study was to evaluate the work of the aviation medical teams of the territorial Center of Disaster Medicine of the Republic of Crimea in the field of sanitary aviation evacuation and rendering emergency consultative medical aid to the patients who had suffered in an emergency.

Materials and research methods. The functioning of the department of emergency consultative medical care and medical evacuation of the territorial disaster medicine centre of the Republic of Crimea on the development of air ambulance in 2019-2021 was analyzed.

The following was evaluated:

- organization and performance of the flights of the air medical teams for medical support of the population (emergency consultations, medical evacuations), as well as of victims in emergency situations [5-9]:

- work of the air traffic control post to collect information, notify the aircraft crew, and transfer calls to specialists of the aviation medical team;

- alerting and work of the aviation medical team on board the aircraft, as well as in case of threat of emergency;

- carrying out activities to improve the readiness of aviation medical team specialists, as well as other non-staff specialists to perform tasks of sanitary aviation evacuation of patients and victims in emergencies.

Research results and their analysis. The structure of the Crimean territorial disaster medicine centre includes: ambulance service consisting of 7 stations, 25 substations of the Emergency Medical Service, and 54 Emergency Medical Service Teams stationed permanently; a Disaster Medicine Service Department; a Department for Emergency Consultative Medical Aid and Medical Evacuation, and a Republican Telemedical Center.

The Department of Emergency Consultative Medical Aid and Medical Evacuation has its own round-the-clock dispatcher post, which minimizes the time of decision making on medical evacuation by air transport. The Ansat helicopter is based at Zavodskoye airport, located 10 km away from the territorial disaster medicine centre office building, which also ensures optimal time of arrival of flight and medical personnel to the assembly point.

In addition, the location of the airport "Zavodskoye" is unique in that its runway passes between two ridges of the Crimean mountains, so the emerging wind rose and their speed creates excellent conditions for the work of light aircraft.

The analysis of the results of the study showed that in the Republic of Crimea the proportion of persons hospitalized for emergency indications during the first day, in the total number of patients to whom flights were performed in all cases, was in 2019-2021. 91-93%, with a target of 90%.

To perform air ambulance evacuation of patients to Level 3 medical treatment organizations, one full-time anesthesiology and intensive care unit (an anesthesiologist and nurse anesthetist) on round-the-clock duty is involved. If necessary, the aviation medical team is staffed by other specialists. Ansat helicopter owned by "Russian Helicopter Systems" company and equipped with a medical helicopter module is used for air ambulance evacuation, which meets the

¹ On the Fundamentals of Health Care in the Russian Federation: Federal Law of November 21, 2011 No. 323-FZ

² On approval of the procedure for providing emergency, including specialized emergency, medical care: Order of the Ministry of Health of Russia from June 20, 2013 No. 388n

requirements of the Federal Law of November 21, 2011 №323-FZ¹ and the order of the Russian Ministry of Health of June 20, 2013 №388n².

An analysis of the work of the Emergency Consultative Medical Care and Medical Evacuation Department of the territorial disaster medicine centre in 2019-2021 is presented in the table.

The data in the table show that the annual number of evacuees was 203-235, and the proportion of children evacuated by air transport was in 2019, 2020 and 2021. 42.8, 29.6, and 25.2%, respectively. In the total child population evacuated by air ambulance in 2019, 2020 and 2021, the proportion of children under 1 year of age was 61.9, 64.2 and 35.4%, respectively.

In addition, 7, 13, and 10 pregnant women were evacuated by air ambulance in 2019-2021, which required additional involvement of the obstetrics and gynecology and pediatrics teams.

It should be noted that air ambulance patient care in 2019-2021 was performed to the fullest extent within the funds allocated from the federal and regional budgets.

The staffing of the aviation medical team: anesthesiologist, as a rule, of the highest or first medical category — 5.5 rates, of which 1 — candidate of medical sciences; nurse anesthetist or paramedic — specialists of the highest or first category — 5.5 rates. The length of service of aviation medical team is more than 5 years.

The number of specialists additionally engaged for the purpose of air ambulance evacuation was: in 2019 — 203 people; in 2020 — 207 people; in 2021 — 238 people.

A characteristic feature of non-staff specialists recruited to staff aviation medical teams is their lack of knowledge in matters of aviation medicine, aviation ergonomics and aviation psychophysiology. Flights are performed both over land, including mountainous terrain, and over water (sea) to medical organizations located at a maximum distance of 200-215 km (Kerch) from the base airfield (Simferopol).

Interregional transportation to Krasnodar (380 km) is also carried out.

It should be noted that they lack knowledge of the basics of medical evacuation, in particular about risks of flight personnel (pilot, navigator) contamination during evacuation of patients with especially dangerous infections, about taking into account the severity of the patient, about need for rapid evacuation in medical organization of Level 3, etc.

It should also be considered that during the evacuation of patients in a severe and extremely severe condition, there may be cases of abnormal and emergency situations (failure of one or two engines in flight, forced hard landing, helicopter tipping on the side during landing, crash landing, increased engine vibration, failure of various systems, low frequency vibrations of the helicopter in flight, etc.) when operating the aircraft. In addition, when performing long flights it is necessary to take into account the fact of the impact of specific factors of the flight (hypoxia, noise, vibration) both on the patient and on the members of the aviation medical team. It is the knowledge of aviation medical team personnel of the peculiarities of performing flights in different flight regimes and different meteorological conditions that allows to adequately perform all the necessary manipulations to the patients in time and space intervals.

For example, in 2021 in the Republic of Crimea as part of the air ambulance evacuation 12 long-distance flights of over 200 km were performed with the evacuation of 12 patients, including 11 children. In addition, in 2021 11 injured patients, including one child under the age of 1 year, were evacuated from the scene of a traffic accident to a Level I trauma center.

The next peculiarity of attracting non-staff specialists or other medical personnel to the aviation medical team is the lack of permanent practice of working with the medical equipment included in the medical helicopter module. In such a case, the most promising is additional instruction and training with medical equipment on board the aircraft "on the ground" and in the training department of the territorial disaster medicine centre.

Thus, it can be stated that during the sanitary task of providing emergency specialized medical aid to patients in the Republic of Crimea the members of the flight crew of the aircraft and specialists of aviation medical teams must be ready for aviation incidents in the operation of aviation equipment and for adequate actions to organize primary life support for a patient who is usually in a serious or extremely serious condition, and for members of the aviation medical team themselves.

Conclusion

To improve the quality of training of medical personnel involved in the provision of specialized emergency medical care on board an aircraft, including in extreme flight conditions, it is advisable to organize short-term courses to familiarize them with the basics of aviation medicine, aviation ergonomics, psychophysiology of the flight crew, and the features of acting in nonstandard situations in flight.

Таблица / Table

Итоги работы санитарной авиации Республики Крым в 2019–2021 гг.

Results of the work of sanitary aviation of the Republic of Crimea in 2019-2021

Показатель / Indicator	2019	2020	2021
Количество вылетов, абс. Number of departures	178	207	238
Число эвакуированных, чел. Number of evacuated patients, person	203	226	258
из них детей of which children	87	67	65
в том числе в возрасте до 1 года of which children under 1 year of age	53	43	23
Число проконсультированных пациентов, чел. / Number of consultations, person	6	14	23
из них детей of which children	2	0	5

In order to improve the quality of medical care for patients evacuated on aircraft, it is also necessary to train flight personnel in the basics of medical evacuation and organization of cross-action between the aircraft crew and medical personnel when providing emergency medical care.

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In order to optimize the work of non-staff specialists of aviation medical teams in flight, instructor training and simulations on the rules of airborne medical equipment operation should be carried out with them "on the ground".

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