

АКТУАЛЬНЫЕ ПРОБЛЕМЫ МЕДИЦИНСКОЙ ЭВАКУАЦИИ ACTUAL PROBLEMS OF MEDICAL EVACUATION

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РЕАЛИЗАЦИЯ СТРАТЕГИИ РАЗВИТИЯ САНИТАРНОЙ АВИАЦИИ В ОМСКОЙ ОБЛАСТИ

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Резюме. Цель исследования – изучить и оценить промежуточные результаты реализации стратегии развития санитарной авиации в Омской области.

Материалы и методы исследования. Материалы исследования: учетные формы, заполняемые специалистами территориального центра медицины катастроф (ТЦМК) в информационной системе «Мониторинг центров медицины катастроф» (smk.minzdrav.gov.ru); отчетная форма отраслевого статистического наблюдения №56 «Сведения о деятельности медицинских организаций, осуществляющих оказание экстренной медицинской помощи и проведение медицинской эвакуации при выездных формах работы, в том числе имеющих отделения экстренной консультативной медицинской помощи» за 2021 год; отчеты о работе ТЦМК Омской области.

Методы исследования – аналитический, статистический.

Результаты исследования и их анализ. Проанализированы изменения, произошедшие при совершенствовании комплекса системных подходов к организации оказания медицинской помощи в экстренной форме населению Омской области. Выполнен сравнительный анализ показателей работы авиамедицинских бригад (АМБр) ТЦМК при оказании экстренной медицинской помощи (ЭМП) с применением санитарной авиации в режимах повседневной деятельности и чрезвычайной ситуации (ЧС).

Ключевые слова: авиамедицинские бригады, Омская область, санитарная авиация, санитарно-авиационная эвакуация, территориальный центр медицины катастроф, экстренная медицинская помощь

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REALIZATION OF STRATEGY OF SANITARY AVIATION DEVELOPMENT IN OMSK AREA

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Summary. Investigation purpose – to research and assess an interim results of sanitary aviation development strategy realization in Omsk area.

Materials and methods of the investigation. Investigation materials: accounting forms filled in “Disaster medicine centers monitoring” system (smk.minzdrav.gov.ru) by specialists of territorial center of disaster medicine (TCDM); report form of industry statistic monitoring №56 “An information about an activity of medical organizations which implement an urgent medical treatment provision and medical evacuation conducting on mobile work forms, including organizations having an emergency consulting medical treatment departments” in 2021; Omsk area TCDM work reports.

Investigation methods – analytic, statistic

Investigation results and their analysis. Changings which happened during improvement of complex of systematic approaches to the organization of emergency form medical treatments provision for population in Omsk area were analyzed. A comparative analysis of avia-medical crews of TCDM work indicators during emergency medical treatment provision with a usage of sanitary aviation in daily and emergency modes were analyzed.

Key words: avia-medical crews, emergency medical treatment, Omsk area, sanitary aviation, sanitary-aviation evacuation, territorial center of disaster medicine

Conflict of interest. The authors declare no conflict of interest

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Introduction

The territory of the Omsk region occupies 1/5 of the territory of Western Siberia. The length of the Omsk region from north to south is 600 km, and from west to east is 300 km. The Omsk region consists of 32 municipal districts and 6 cities.

To increase the availability of medical care to the population of the region in 2016, in accordance with the Order of the Ministry of Health of the Omsk region "On routing in the provision of medical care to patients injured in road accidents in the Omsk region" №283-р the responsibility areas of medical treatment organizations (LMO) to provide emergency specialized medical care to this category of victims were defined.

In order to execute the Decree of the President of the Russian Federation "On the strategy of development of healthcare in the Russian Federation for the period until 2025" from June 6, 2019 № 254, taking into account climatic, geographical and demographic features of the region, the order of the Governor of the Omsk region from July 31, 2019 №137-р based on the model strategy of development of sanitary aviation in the subjects of the Russian Federation (hereinafter — subjects) the strategy of development of sanitary aviation in the Omsk region until 2024 was approved.

By 2019, the system of emergency medical care in the Omsk region included: 2 regional hospitals, 15 city hospitals, 2 hospitals of emergency medical care, 32 central regional hospitals (CRH), 4 maternity hospitals and perinatal center. It should be noted that there was a significant shortage of medical personnel in the region, and the coefficient of combination of doctors was 1.5.

The Omsk region's ambulance service is represented by an ambulance station in Omsk with 95 teams and 2 specialized psychiatric ambulance teams, which operate on the basis of a clinical psychiatric hospital. In 32 municipal districts there are ambulance departments attached to central district hospitals, with 57 visiting teams.

Since in the northern districts of the Omsk region — Ust-Ishimsky, Tevrizsky, Znamensky, Tarsky, Sedelnikovskiy, Bolsherechensky — there are periodic restrictions in transport communication with a number of settlements, it is possible to organize medical care in these areas only using ground transport of high cross-country ability or using air ambulance.

The aim of the research is to study and evaluate the intermediate results of the implementation of the strategy for the development of sanitary aviation in the Omsk region.

Materials and methods of research. The research was performed in the Federal Center for Disaster Medicine (FCDM) of the Federal State Budgetary Institution "N.I. Pirogov National Medical and Surgical Center" of the Ministry of Health of Russia and the Omsk Regional Clinical Hospital "Territorial Center for Disaster Medicine" (TCDM) in 2022. In the course of the study a comparative analysis of the emergency aviation service in the Omsk region before

and after the creation of the emergency advisory ambulance service (EASM) in the structure of the TCDM was performed. TCDM specialists entered information electronically into the following sections of the information system "Monitoring of Disaster Medicine Centers" (smk.minzdrav.gov.ru): "Information about the activities of medical organizations providing emergency medical care and medical evacuation in outreach work", "Daily performance of outreach teams of TCDM in the mode of daily activities".

We used data from the reporting form of sectoral statistical observation №56 "Information on the activities of medical organizations providing emergency medical care and medical evacuation in off-site forms of work, including those having emergency consultative medical care departments for 2021" and other reporting documentation, as well as information provided by the TCDM of the Omsk region.

The object of the study is the system of emergency medical care and medical evacuation using air ambulance in the Omsk region.

Results of the study and their analysis. Since 2017 the Omsk region participates in the implementation of the priority federal program to ensure the timeliness of emergency medical assistance to citizens living in hard-to-reach areas of the Russian Federation. Thanks to additional funding, the number of air ambulance departures in the region is increasing annually.

Thus, from 2016 to 2021 the number of air ambulance departures in the region increased 6.8 times, from 64 to 439.

For the last 3 years 4 medical districts have been formed in the region, which included several municipal districts with an average population of 100-150 thousand people, and inter-municipal medical centers (IMC) have been created.

Until 2020, only inter-hospital transportation of patients and victims in emergency situations by the specialists of the ECMC department of the regional clinical hospital with the helicopter based in the international airport of Omsk was carried out in the territory of the region using sanitary aviation.

Since there was no aviation infrastructure in the region, the flights were performed only during daylight hours, with not more than one flight per day to northern regions. In this regard, one of the main tasks faced by the health management body was to solve the issues of accessibility of medical care provided in emergency form to the population of the northern regions. In these areas there were practically no paved roads, especially great was the shortage of medical personnel, the level of material and technical equipment of medical treatment organizations (LMO), located at a considerable distance from the specialized medical centers located in Omsk, was low.

As a result of the study the facts were revealed, which, in our opinion, significantly complicate the provision of access to emergency medical care for the population of the Omsk region:

- presence of hard-to-reach settlements;
- low population density, especially in rural areas;

- low level of availability of doctors, especially in rural areas — on average, it is 2 times lower than in cities;
- lack of logistics for the prompt flight of an air ambulance unit to the place of call;
- lack of aviation medical brigades on duty at the location of the helicopter;
- underdevelopment of aviation infrastructure for 24/7 flights;
- remoteness of specialized medical centers from the northern regions of the Omsk region.

In this regard, the system of organization of emergency medical care has been changed — in 2020 an additional department of ECMC on the basis of TCDM was created. In addition, the territory of the Omsk region was divided into two areas of responsibility assigned to air ambulance: the southern part of the region, including the regional center, was assigned to the regional clinical hospital; the population of nine northern regions, most distant from Omsk — Tarsky, Znamensky, Tevrizsky, Ust-Ishimsky, Bolsheukovsky, Sedelnikovsky, Muromtsevsky, Bolsherechensky and Kolosovsky — became the responsibility of the TCDM.

To ensure the efficiency of calls, the regional information management system of the ambulance service was transformed into the unified dispatching service of the emergency consultative service of the Omsk Region. Helicopter (landing) platforms were built and reconstructed, located at a distance, providing a 15-minute access by ambulance to the medical treatment organization.

In Tara airport there is an additional location of Mi-8 helicopter equipped with a medical helicopter module. Travel time from the new location to LMO Level 2 was not more than 10 minutes.

A helipad was built near the admission department of Tara Clinical Hospital, with the prospect of using light helicopters.

A round-the-clock air ambulance station and formed specialized aviation medical teams were deployed, a primary vascular center created, an angiograph and a magnetic resonance tomograph put in place and trained diagnosticians were involved. As a result, most patients with acute coronary syndrome (ACS) and acute cerebral circulatory disorder (ACDD) began to be evacuated from the northern regions to the LMO of Tara.

In the structure of the new ECMC department, a 24-hour consultation and dispatch center was created on the basis of the TCDM, which allows to monitor all patients in a severe condition, as well as to receive operational information from the LMO of the area of responsibility — 9 northern districts. An anesthesiologist resuscitator - senior physician of the ECMC department became a consultant of the Consultative Dispatch Center of the TCDM. These changes made it possible to plan the number of air ambulance evacuations of patients and to determine the routes of upcoming departures from the areas of responsibility.

In order to promptly respond to the calls and to expand the Mi-8 helicopter takeoff and landing capability, the helicopter landing sites were determined and agreed upon with the heads of administration of the northern districts.

In addition to carrying out inter-hospital medical evacuation, during the period of freeze-up and ice drift on the Irtysh River began to carry out medical and aviation evacuations of patients and victims of emergencies from hard-to-reach settlements. Helicopter landing sites were also agreed with the heads of these rural settlements. In 2020-2022 TCDM spe-

cialists performed 11 emergency air ambulance evacuations from hard-to-reach settlements in the northern regions.

To improve the efficiency of the work, the specialists of TCDM developed methodological guidelines for each stage of air ambulance evacuation — from the consultative "call" to the moment of the patient's hospitalization in the specialized medical center. Creation of full-fledged vascular medical center in Tara allowed to evacuate the absolute majority of patients with vascular pathology from the northern territories, and thus to solve the problem of timely start of specialized medical care in emergency form in the hospital period.

TCDM of the Omsk region specialists calculated helicopter flight time to 9 northern districts of the Omsk region depending on distance from helicopter basing places in Omsk and Tara (table).

During the 1st quarter of 2022 the specialists of the aviation medical teams of TCDM performed air ambulance evacuation of 67 patients from attached territories to the specialized vascular center of Tara. A comparative analysis of the air ambulance evacuation of patients to Tara and Omsk resulted in 112 flight hours saved. Taking into consideration the cost of one flight hour, the financial savings amount to more than 27.5 mln.

Таблица / Table

Время (мин) полета вертолета Ми-8 в северные районы Омской области
Flight time (min) of Mi-8 helicopter to northern areas of the Omsk region

Населенные пункты, в которых расположены ЛМО Settlements with medical treatment organizations (MTO)	Время полета Flight time		Сокращение времени полета Reducing of flight time
	до г.Омска to the city of Omsk	до г.Тара to the city of Tara	
Большеречье –ЛМО 1-го уровня Bolsheyreche –1 st level MTO	60	30	30
Большие Уки –ЛМО 1-го уровня Bolshie Uki –1 st level MTO	90	30	60
Знаменское –ЛМО 1-го уровня Znamenskoe –1 st level MTO	85	20	65
Колосовка –ЛМО 1-го уровня Kolosovka –1 st level MTO	75	25	50
Муромцево –ЛМО 1-го уровня Muromtsevo –1 st level MTO	80	30	50
Седельниково –ЛМО 1-го уровня Sedelnikovo –1 st level MTO	95	25	70
Тара (место базирования) –ЛМО 2-го уровня Tara (place-based) – 2 nd level MTO	70	0	70
Тевриз –ЛМО 1-го уровня Terviz –1 st level MTO	110	40	70
Усть-Ишим –ЛМО 1-го уровня Ust-Ishim –1 st level MTO	140	70	70

Conclusion

1. As a result of improvement of organizational approaches during rendering emergency medical care to the patients and victims of emergencies by means of sanitary aviation the accessibility of medical aid for the residents of hard-to-reach and remote areas of the Omsk region has increased, and accordingly the efficiency of their treatment has increased, the prognosis of favorable outcome of patients in life-threatening conditions has improved.

2 The territory of the Omsk region is divided into two zones of responsibility for the provision of medical care to patients using air ambulance.

3. Level 2 LMO is established, which is equipped with angiograph, magnetic resonance imaging device and staffed with appropriate specialists.

4. A new location of medical helicopter with air ambulance team is organized.

5. Flights to patients in the pre-hospital period began to be carried out.

6. The time of helicopter flight and air ambulance evacuation of patients almost halved.

7. Significant socio-economic effect was achieved.