

КЛИНИЧЕСКИЕ АСПЕКТЫ МЕДИЦИНЫ КАТАСТРОФ CLINICAL ASPECTS OF DISASTER MEDICINE

<https://doi.org/10.33266/2070-1004-2021-31-34>
UDC 616-001[470.315]

Original article
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PREVALENCE, STRUCTURE AND NATURE OF INJURIES IN CITY OF RYAZAN AND RYAZAN REGION, ACCORDING TO RECORDS OF EMERGENCY MEDICAL TEAMS

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Abstract. *The aim of the study* is to study the prevalence, structure and nature of injuries, to identify the frequency of deaths at the stage of medical evacuation, and to determine the number of injured people who need medical care in medical organizations (LMO), according to the data on requests of the population of the Ryazan region and the city of Ryazan for emergency medical care (SMP).

Materials and methods of research. Statistical data on the requests of victims with injuries for emergency medical care in the Ryazan region and the city of Ryazan are analyzed. Materials of the study – maps of calls of the SMP teams in Ryazan and statistical data for the Ryazan region for 2017-2019.

The results of the study and their analysis. The most frequent causes of injuries, their nature, the frequency of requests of the population of the Ryazan region and the city of Ryazan for emergency medical care, the number of deaths and the frequency of hospitalizations for injuries were determined.

Key words: *causes of injuries, emergency medical teams, prevention of injuries, Ryazan region, Ryazan, traumatism, types of injuries*

Conflict of interest. The authors declare no conflict of interest

For citation: Yankina S.V., Shatrova N.V., Efratov A.Ju. Prevalence, Structure and Nature of Injuries in City of Ryazan and Ryazan Region, According to Records of Emergency Medical Teams. *Meditsina Katastrof = Disaster Medicine*. 2021; 1: 31-34 (In Russ.). <https://doi.org/10.33266/2070-1004-2021-1-31-34>

<https://doi.org/10.33266/2070-1004-2021-1-31-34>
УДК 616-001[470.315]

Оригинальная статья
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РАСПРОСТРАНЕННОСТЬ, СТРУКТУРА И ХАРАКТЕР ТРАВМАТИЗМА В Г.РЯЗАНИ И РЯЗАНСКОЙ ОБЛАСТИ, ПО ДАННЫМ ВЫЗОВОВ БРИГАД СКОРОЙ МЕДИЦИНСКОЙ ПОМОЩИ

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Резюме. *Цель исследования* – по данным обращаемости населения Рязанской области и г.Рязани за скорой медицинской помощью (СМП) изучить распространенность, структуру и характер травматизма, выявить частоту смертельных исходов на этапе медицинской эвакуации и определить число пострадавших с травмами, нуждающихся в оказании медицинской помощи в лечебных медицинских организациях (ЛМО).

Материалы и методы исследования. Проанализированы статистические данные об обращаемости пострадавших с травмами за скорой медицинской помощью в Рязанской области и г.Рязани. Материалы исследования – карты вызовов бригад СМП в г.Рязани и статистические данные по Рязанской области за 2017–2019 гг.

Результаты исследования и их анализ. Определены наиболее частые причины получения травм, их характер, установлены частота обращаемости населения Рязанской области и г.Рязани за скорой медицинской помощью, количество смертельных исходов и частота госпитализаций по поводу травм.

Ключевые слова: *бригады скорой медицинской помощи, виды травм, причины травм, профилактика травм, Рязанская область, г.Рязань, травматизм*

Конфликт интересов. Авторы статьи подтверждают отсутствие конфликта интересов

Для цитирования: Янкина С.В., Шатрова Н.В., Ефратов А.Ю. Распространенность, структура и характер травматизма в г.Рязани и Рязанской области, по данным вызовов бригад скорой медицинской помощи // *Медицина катастроф*. 2021. №1. С. 31-34. <https://doi.org/10.33266/2070-1004-2021-1-31-34>

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Traumatism is one of the most important medical and social problems due to its widespread prevalence, as well as its negative impact on health and working capacity of the population. Injury is one of the main external causes of death and disability. According to the statistics, in the Russian Federation in 2019, 13.24 million patients with injuries, poisoning and other consequences of external influences were officially registered. In the Ryazan region this figure attained 105.8 thousand people.^{1,2}

Compared to previous years, this indicator almost did not change. This allows us to stipulate the urgency of the issue. The existing classification of injuries is not exhaustive, the causes and structure of injuries are not sufficiently studied, there are no clear recommendations for its their prevention. The frequency of calls for ambulance teams and their role in providing emergency medical care to injured victims have not been determined. Therefore, the question of the effectiveness of injury prevention and of timely provision of emergency medical care remains essential. In order to develop and to carry out measures for the prevention of injuries, it is necessary to collect accurate statistical data on the main causes of damage, on their structure and on the influence of external factors on their occurrence. The real situation with the prevalence of injuries is much worse than it is presented in statistical data, since many victims do not call the ambulance team and do not refer to a medical organization. Often this is due to a neglectful attitude to their own health or to the health of their relatives. Also it can be due to an inaccessibility of inpatient and outpatient medical care [1].

The purpose of the study is to explore prevalence, structure and nature of injuries analysing the data on calls for the emergency medical care of the population of the Ryazan region in general and of the city of Ryazan in particular, to reveal the frequency of deaths at the stage of medical evacuation and to determine the number of injured persons who need medical assistance at medical organization.

Materials and research methods. The article analyzes the statistical data on the recourse of injured people to emergency medical care in the Ryazan region; identifies the main causes and types of traumatic injuries, the number of deaths and the frequency of hospitalizations in Ryazan. Research materials - maps of calls of ambulance brigades in Ryazan and statistical data for the Ryazan region

in 2017–2019.

Research results and their analysis. According to the Ministry of Health of Russia, despite all the preventive measures taken in 2017–2019 the number of injuries in the Russian Federation did not decrease. Instead it grew insignificantly, but steadily. We observe this growth in the Ryazan region. As of January 1, 2020, the population was: in the Ryazan region - 1 million 108.8 thousand people; in Ryazan - 539.3 thousand people. In 2019, more than 105 thousand residents of the Ryazan region got various injuries - 9.5% of the total population, i.e. almost every tenth inhabitant. This data takes into ac-

Таблица 1/ Table No 1

Число пострадавших с травмами, обратившихся за медицинской помощью в 2017–2019 гг., чел., по данным Минздрава России

Absolute number of injuries in the Russian Federation and the Ryazan Region, according to the Ministry of Health of Russia in 2017-2019, people

Российская Федерация, субъект Российской Федерации Russian Federation, subject of the Russian Federation	2017	2018	2019
Российская Федерация Russian Federation	12 927 459	13 058 127	13 240 892
Рязанская область Ryazan Region	85 949	104 888	105 787

count only those who sought medical help (Table 1).

We have analyzed the maps of calls for ambulance brigades in Ryazan in 2017–2019. In total, 66307 calls of ambulance teams to injured victims were registered over these years (22735/23189/20383 calls, respectively). At the same time, in the Ryazan region, including the city of Ryazan, there were 134947 calls of the ambulance brigades for injuries (44638/45069/45240 calls, respectively), i.e. about 50% of victims called the ambulance team, and about 50% of them came to a medical organization on their own. Most likely, this was due to the fact that the injuries received were light and not life-threatening, i.e. the victims could independently get to the nearest medical facility and did not need emergency medical assistance. And possibly some of the victims could get to the hospital faster than if they would wait for the arrival of an ambulance team [2].

In the structure of injuries, industrial and non-industrial injuries are distinguished. Industrial injuries are caused by the production activities of people and are associated with non-observance of labor protection rules, with the violation of production and labor discipline [3]. For example, in the Ryazan region, the frequency of calls to ambulance teams for work injuries in 2017-2019 was 587, 686 and 612 calls, respectively, i.e. despite the general decrease in occupational injuries in the country on the whole, in Ryazan there was a slight (by

¹ Социально значимые заболевания населения России в 2018 году. Статистические материалы. М., 2019

² Социально значимые заболевания населения России в 2019 году. Статистические материалы. М., 2020

4.3%) increase in 2018 and the absence of dynamics in 2019 compared to 2017. In just 3 years, 1,885 calls for injuries at work were recorded in the Ryazan region, including 1234 calls in Ryazan. This equals 1.4% of the total number of calls for accidents. In the Ryazan region, with the exception of Ryazan, the number of calls to the ambulance teams for industrial injuries was significantly less, which is mainly due to the fact that the largest production enterprises are located in Ryazan. Measures for the prevention of industrial injuries are aimed at providing workers with all the necessary personal protective equipment, improving technological processes, ensuring rational distribution of working time, as well as organising a mandatory training in first aid. In Russia, in order to prevent injuries at work, special programs are being developed to ensure labor protection and to create safe conditions [4]. In the Ryazan region, measures are taken to prevent industrial injuries and to train industrial workers in first aid.

Non-work-related injuries represent an overwhelming majority of injuries - 97-98% of cases. They are more variable in nature and can be grouped into household, outdoor, road transport, children and sports injuries. The most common are household and outdoor injuries - in the Russian Federation their share is 60 and 21%, respectively. Household injuries, as a rule, result from the non-compliance with safety rules when doing work around the house, in the garage, in the yard. The most common cases are sprains and bruises of soft tissues, small superficial wounds and abrasions, partial ruptures of ligaments and tendons, fractures of tubular bones. Outdoor injuries are injuries sustained in an open area as a result of an accident or outdoor activities.

In order to prevent household injuries, it is necessary to train people in safety and to improve their living conditions. To alleviate problems with outdoor and road traffic injuries, the city administration can help to improve the condition of yards, highways, open areas by carrying out repair work and timely removal of snow and ice in winter. Traffic police officers can carry out activities to improve road safety, identifying the areas where road traffic accidents occur most often [5].

The study found that alcohol intoxication and antisocial behavior are among the most common causes of injury. The so-called alcohol injury includes injuries sustained in road traffic accidents when drivers are drunk, as well as violence acts and accidents with drunk people involved.

As can be seen from the data in Table 2, in the Ryazan region, among the accidents of non-production nature, the calls of the ambulance teams for injuries at households are most often - 48.3%; next come street injuries - 26.2; criminal injuries - 13.5; and finally traffic accidents - 7.0%. The proportion of injuries got by drunk people remains very high both in the country as a whole and in the city of Ryazan. Among those who sought emergency medical care, the proportion of people who were intoxicated by alcohol was 21%. Thus, it is important to take measures to combat alcoholism, to draw people's attention to the fact that in a state of alcoholic intoxication the risk of injury increases by several times³.

In the Russian Federation in 2017–2019 in the structure of injuries in terms of localization, the most frequent were open wounds and superficial injuries, as well as sprains, dislocations

Таблица 2/Table No 2

Распределение травм (в том числе полученных в состоянии алкогольного опьянения) по их видам в 2017–2019 гг., чел., по данным вызовов бригад СМП в Рязанской области

Structure of injuries by type of injury in 2017-2019, according to the records of calls of the SMP teams of the Ryazan Region, people

Виды травм Injuries	2017	2018	2019	Итого, чел./% Total, people/%
Производственные Occupational	587 (2)	686 (6)	612 (4)	1885(12)/1,4
Бытовые Household accidents	21806 (4876)	21603 (5031)	21774 (4853)	65183(14760)/48,3
Уличные Street	11447 (2979)	11855 (3020)	11983 (2984)	35285(8983)/26,2
Полученные в ДТП In road accidents	3157 (97)	3128 (106)	3142 (103)	9427(306)/7,0
Криминальные Criminal	5992 (1402)	6135 (1384)	6055 (1509)	18182(4295)/13,5
Прочие: спортивные и др. Other types – sports and others	1649	1662	1674	4985/3,7

and overstrain of capsular-ligamentous apparatus, muscle and tendon injuries. The analysis of calls of ambulance brigades in Ryazan showed that most often city residents called ambulance brigades for head trauma: superficial head trauma, open head wound, fracture of the skull and facial bones, concussion, etc. At the same time, the proportion of victims with concussion accounts for about 67% of all victims with head and neck trauma (Table 3).

In second place there are poisonings - 22.5%, most often people are poisoned with alcohol, ethanol and alcohol of unknown origin - about 70% of all poisonings. Almost 2 times less often, residents of Ryazan call ambulance teams for open wounds of soft tissues - 12% of calls, which is probably due to the lightness of injury and to the possibility of self-help at home, as well as to the free access to dressing and disinfectants. Having got fractures, residents of Ryazan call emergency teams in 6.2% of cases, most often it is a fracture of femoral neck, femur or shin bones. Despite the fact that fractures of the upper extremities occur a little more often than fractures of the lower extremities - 33.7 and 31%, respectively - victims with a fracture of a lower extremity cannot get to a medical organisation on their own, and therefore they call the ambulance team [6]. So, in 2019, 440 and 873 emergency calls were recorded for fractures of upper and lower extremities, respectively.

Calls to the ambulance teams for chest injuries, burns and frostbite, dislocations, sprains and overstrain of the capsular ligamentous apparatus were recorded in 3.8, 3.4 and 2.4% of cases, respectively. Such a low percentage of referrals for these reasons is associated, as a rule, with the lightness of injury, and sometimes with a neglect of one's health. Among other injuries, which are dealt with by emergency doctors, there are injuries of abdomen and internal organs (0.9% of calls), fractures of spine and pelvic bones (0.5%), concomitant injuries (1.1% of calls), as well as genital bruises, foreign bodies, drowning, etc.

As can be seen from the data in Table 4, in Ryazan, as in the country as a whole, men are injured more often than women, according to our data - 60 and 40% respectively. In 2017–2019

³ Организационно-методические указания по подготовке Службы медицины катастроф Минздрава России в области защиты жизни и здоровья населения при чрезвычайных ситуациях на 2019 год

**Структура травматизма по локализации и характеру повреждений в 2017–2019 гг., чел.,
по данным вызовов бригад СМП в г.Рязани**

The structure of injuries by localization and nature of injuries in 2017–2019,
according to the data of the records of the SMP teams of the city of Ryazan, people

Травмы Injuries	2017	2018	2019	Итого, чел./% Total, people/%
Травмы головы и шеи / Head and neck injuries	6526	6735	6234	19495/29,4
Отравления / Poisoning cases	5231	5015	4675	14921/22,5
Открытые раны мягких тканей / Open soft tissue wounds	2497	2943	2529	7969/12,0
Переломы трубчатых костей / Fractures of the tubular bones	1372	1414	1351	4137/6,2
Травмы грудной клетки / Chest injuries	834	861	858	2553/3,8
Термические травмы / Thermal injuries	797	792	690	2279/3,4
Вывихи, растяжения, перенапряжение капсульно-связочного аппарата / Dislocations, sprains, overstrain of the capsular ligamentous apparatus	590	535	470	1595/2,4
Сочетанные травмы / Combined injuries	260	222	249	731/1,1
Травмы живота и внутренних органов / Injuries to the abdomen and internal organs	216	205	193	614/0,9
Перелом позвоночника и костей таза / Fracture of the spine and pelvic bones	117	128	106	351/0,5
Прочие / Other injuries	4295	4339	3028	11662/17,7

emergency doctors failed to save the lives of 43 people (0.06%). They died from their injuries during medical evacuation. On average, in 50% of cases of calling the ambulance teams, the victims needed medical assistance to be delivered in the medical care facility, but in 2017–2019 a slight tendency of an increase in the number of cases of emergency medical care at the scene of an event was revealed - in 2017, 54.8% of injured persons were delivered to medical centers; in 2018 - 46.8; in 2019 - 47.7%.

Conclusion

1. Analysis of statistical data for the Ryazan region for 2017–2019 revealed a slight increase in the number of injured people and in the number of people seeking emergency medical help for injuries.

2. In the Ryazan region, as in Russia as a whole, household and outdoor injuries prevail.

3. Most often, residents of Ryazan call an ambulance for head and neck injuries - the main reason here is a concussion, as well as for poisoning and for open wounds of soft tissues.

4. During the specified period, the proportion of deaths from injuries at the stage of medical evacuation was 0.06% and had no tendency to increase.

Таблица 4/Table No 4

**Показатели деятельности бригад СМП в г.Рязани
в 2017–2019 гг., чел.**

Indicators of the work of the SMP teams in the city of Ryazan
in 2017–2019, people

Показатель Indicator	2017	2018	2019	Итого, чел./% Total, people/%
Количество вызовов бригад СМП Number of calls of the SMP teams	22735	23189	20383	66307/ 100,0
Число пациентов: Number of patients: - мужчин / men - женщин / women	13514 9220	13915 9274	12205 8178	39634/60,0 26672/40,0
Количество смертельных исходов Fatal outcome	16	13	14	43/0,06
Число пациентов, доставленных в ЛМО Delivered to the medical organization	12473	10864	9730	33067/50,0

5. In 50% of cases, injured victims required medical assistance at medical organization, while the number of cases of emergency medical assistance at the scene increased.

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Материал поступил в редакцию 08.10.20; статья принята после рецензирования 28.10.20; статья принята к публикации 10.02.21
The material was received 08.10.20; the article after peer review procedure 28.10.20; the Editorial Board accepted the article for publication 10.02.21