

ORGANIZATIONAL ASPECTS OF PROVIDING EMERGENCY CARE TO VICTIMS IN ROAD TRANSPORTATION ACCIDENTS WITH DAMAGE TO THE FACIAL SKELETON

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Abstract. *The aim of the study is to investigate the organizational aspects of providing emergency medical care to victims of road traffic accidents with injuries of the facial skeleton.*

Materials and research methods. The study included 75 victims of road accidents that occurred in the city of Saratov in 2010–2019. In the total number of injured men – 42 (56.0%), women – 33 (44.0%). The age of the victims is 18–70 years, the average age is (37.5 ± 6.0) years. The study did not include: victims under the age of 18; victims with neck trauma, damage to the cerebral section of the skull and to other parts of the body. All the victims got medical assistance from the personnel of the ambulance brigades. Covering sheets, outpatient cards and medical records were used as primary documentation.

Study criteria: time during which the ambulance was provided; who provided emergency medical care; correctness of its rendering.

Research results and their analysis. Analysis of injuries to the facial skeleton showed:

- injuries of the facial skeleton are an actual pathology in victims of road traffic accidents in Saratov;
- victims of road accidents got open and closed injuries of the facial skeleton. With closed injuries, moderate and severe injuries were found in 23 (30.7%) victims, with open injuries – in 19 (23.3%) victims;
- majority (90.7%) of victims of road accidents got high-quality emergency medical aid in a timely manner. In 9.3% of cases, the quality of care was insufficient due to an incorrect assessment of severity of the victims' condition and, as a consequence, due to non-fulfillment of anti-shock measures;
- scope of the provision of emergency medical care to victims of road accidents included temporary hemostasis, treatment of wounds and anti-shock measures;
- from the accident site were evacuated: to level III trauma centers – 24.0% of victims; to level II – 48.0; to level I trauma centers – 28.0% of victims;
- complications in the form of purulent-septic processes were observed in 16.0% of victims;
- competent and timely implementation of anti-shock measures determined an insignificant mortality rate – 4.0%.

Key words: ambulance teams, injured, injuries of the facial skeleton, organizational aspects, road traffic accidents

Conflict of interest. The authors declare no conflict of interest

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ОРГАНИЗАЦИОННЫЕ АСПЕКТЫ ОКАЗАНИЯ СКОРОЙ МЕДИЦИНСКОЙ ПОМОЩИ ПОСТРАДАВШИМ В ДОРОЖНО-ТРАНСПОРТНЫХ ПРОИСШЕСТВИЯХ С ПОВРЕЖДЕНИЯМИ ЛИЦЕВОГО СКЕЛЕТА

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Резюме. *Цель исследования – изучить организационные аспекты оказания скорой медицинской помощи (СМП) пострадавшим в дорожно-транспортных происшествиях (ДТП) с повреждениями лицевого скелета.*

Материалы и методы исследования. В исследование были включены 75 пострадавших в ДТП, произошедших в г.Саратове в 2010–2019 гг. В общем числе пострадавших мужчин – 42 (56,0%), женщин – 33 (44,0%). Возраст пострадавших – 18–70 лет, средний возраст – (37,5±6,0) лет. В исследование не включали: пострадавших, не достигших 18-летнего возраста; пострадавших с травмой шеи, повреждением мозгового отдела черепа и других частей тела. Всем пострадавшим медицинскую помощь оказывал персонал бригад СМП. В качестве первичной документации использовались сопроводительные листы, амбулаторные карты и истории болезни.

Критерии исследования: время, в течение которого была оказана скорая медицинская помощь; кто оказывал скорую медицинскую помощь; правильность ее оказания.

Результаты исследования и их анализ. Анализ травм лицевого скелета показал:

- травмы лицевого скелета являются актуальной патологией у пострадавших в ДТП в г.Саратове;
- у пострадавших в ДТП выявлены закрытые и открытые повреждения лицевого скелета. При закрытых травмах средние и тяжёлые повреждения выявлены у 30,7% пострадавших, при открытых – у 23,3% пострадавших;
- большинству (90,7%) пострадавших в ДТП скорая медицинская помощь была оказана своевременно и качественно. В 9,3% случаев она была оказана недостаточно квалифицированно из-за неправильной оценки тяжести состояния пострадавших и, как следствие, из-за невыполнения противошоковых мероприятий;
- объем оказания скорой медицинской помощи пострадавшим в ДТП включал в себя выполнение временного гемостаза, обработку ран и проведение противошоковых мероприятий;
- с места ДТП были эвакуированы: в травмоцентры III уровня – 24,0% пострадавших; II уровня – 48,0; в травмоцентры I уровня – 28,0% пострадавших;
- осложнения в виде гнойно-септических процессов наблюдались у 16,0% пострадавших;
- грамотное и своевременное выполнение противошоковых мероприятий определило незначительную летальность – 4,0%.

Ключевые слова: бригады скорой медицинской помощи, дорожно-транспортные происшествия, организационные аспекты, повреждения лицевого скелета, пострадавшие

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Relevance of research. In the Russian Federation, the problem of road traffic accidents remains actual. According to a number of authors, in our country the dynamics of the number of road accidents and mortality in them has a wave-like character [1]. The proportion of victims with injuries to the facial and cerebral parts of the skull is 23.9% [2, 3]. Maxillofacial injuries are often combined with damage to vital organs, including the organs of vision [4–6]. In addition, fractures of the lower and upper jaw are often [7]. Severe injuries are accompanied by the development of traumatic shock in the victims, which requires urgent emergency medical care. Such assistance is provided by medical and paramedic teams of the ambulance service [8]. One of the reasons for the high mortality rate in road accidents is the low literacy of road users who do not have or have insufficient skills in providing first aid to victims [9–12]. Much attention is paid to the organizational aspects of providing medical care to victims of road accidents, however, this problem is far from being solved and requires further research [13–15].

The aim of the study is to examine the organizational aspects of providing emergency medical care to victims of road traffic accidents with injuries of the facial skeleton.

Materials and research methods. The study included 75 victims of road accidents that occurred in the city of Saratov in 2010–2019. In the total number of injured men – 42 men (56.0%), 33 (44.0%) – women. The age of the victims is 18–70 years, the average age is (37.5 ± 6.0) years. The study did not include: victims under the age of 18; victims with neck trauma, damage to the cerebral section of the skull and to other parts of the body. All the victims received medical assistance from the personnel of the ambulance brigades. Covering sheets, outpatient cards and medical records were used as primary documentation.

Study criteria: time during which the emergency medical care was provided; who provided emergency medical care; correctness of its rendering.

The following criteria were used to characterize the damage:

– minor injuries: isolated (tangential, through, blind); limited damage to soft tissues of the face without their true defect and without damage to organs – tongue, salivary glands, nerve trunks,

etc.; isolated damage to alveolar ridges of the jaw or to individual teeth without disrupting continuity of the jaw; damage that does not penetrate into natural cavities of the maxillofacial region; single or multiple blind injuries to soft tissues of the face with standard shrapnel elements (balls, arrows, etc.); bruises and abrasions to the face;

– damage of moderate severity: isolated extensive damage to soft tissues of the face without their true defect or accompanied by damage to individual anatomical structures of the maxillofacial region – tongue, salivary glands and their ducts, eyelids, wings of the nose, auricles, etc.; damage to bones of the facial skeleton in violation of their continuity or penetrating into natural cavities; small blind wounds with localization of foreign bodies (fragments) near vital anatomical structures, organs and large vessels;

– severe injuries: isolated soft tissue injuries, accompanied by extensive defects or loss of small, but functionally and cosmetically important fragments of the external nose, eyelids, lips, ears, tongue, soft palate, etc.; damage to upper or lower jaw, accompanied by a bone defect; wounds that penetrate the oral cavity with damage to the hard palate, or that penetrate the nasal cavity and paranasal sinuses; multiple, multi-splintered fractures of bones of the facial skull; damage to large nerve trunks and branches of trigeminal and facial nerves, large vessels and venous plexuses; presence of foreign bodies – fragments, secondary wounding elements near vital and functionally important anatomical formations of the maxillofacial region.

Research results and their analysis. The analysis showed that closed injuries were observed in 45 victims (60.0%), open injuries - in 30 victims (40.0%). Signs of fractures of bones of the facial skull were absent in 50 victims (66.7%), in 25 victims (33.3%) - fractures of bones of the facial skeleton were registered: displacement of bone fragments, manifested by deformation, first of all, of the nose; inability to open the jaw; crepitus of bone fragments.

In the group of victims with closed injuries, light injuries were registered in 22 victims (29.3%); medium – in 18 (24.0%); severe – in 5 victims (6.7%). In victims with open injuries, minor injuries were found in 10 people. (13.3%); medium – in 11 (14.7%); severe – in 9 people. (12.0%).

In 60 cases (80.0%), emergency medical care was provided by doctors, in 15 cases (20.0%) — by paramedic teams of the ambulance.

The average time for an ambulance brigade to reach the victims is (15 ± 4) minutes. During the triage at the scene of the accident, it was found that 15 victims (20.0%) did not need emergency medical care having minor bruises of the soft tissues of the face and no signs of traumatic brain injury (TBI); the remaining 60 victims (80.0%) got emergency medical assistance at the accident site, and they were evacuated to medical organizations. Delivery time to medical organisation — (35 ± 12) min.

At the time of the provision of medical assistance at the accident scene, 42 victims (56.0%) were clearly conscious; in stupor — 25 (33.3%); in coma — 8 victims (10.7%).

The next aspect of the study was to analyze the correctness of provision of emergency medical care at the scene of an accident. In 68 cases (90.7%) the volume of emergency medical care was satisfactory, in 7 cases (9.3%) the gravity of victims condition was underestimated and anti-shock measures were carried out inadequately.

Treatment of wounds and imposition of aseptic dressings were performed in 30 cases (40.0%); temporary hemostasis — in 27 (36.0%); anti-shock measures — in 43 cases (57.3%).

In patients with open injuries, temporary hemostasis was used, in 15 victims (20.0%) pressure bandage was used; in 8 (10.7%) — wound tamponade; in 4 victims (5.3%) — hemostatic clamp.

The following anti-shock measures were taken: infusion therapy — in 36 victims (48.0%); anesthesia with non-narcotic analgesics (analgin 50% 2 ml) — in 25 (33.3%); narcotic analgesics — in 18 victims (24.0%), of which: 1% promedol 1 ml — in 12 victims (16.0%) and morphine — in 6 victims (8.0%).

The ambulance teams delivered: 18 victims (24.0%) to level III trauma centers; 36 (48.0%) — to level II trauma centers; 12 victims (28%) — to level I trauma centers.

In the postoperative period, various complications were recorded in 12 cases (16.0%), lethal outcome — in 3 cases (4.0%). Complications were mainly associated with the development of purulent-septic processes, which most often manifested themselves as wound suppuration — 9 victims (12.0%). The main cause of death is hemorrhagic shock.

Conclusion

1. Injuries to the facial skeleton are an actual pathology in victims of road traffic accidents in Saratov.

2. Victims of road accidents got open and closed injuries of facial skeleton. Among closed injuries, moderate and severe injuries were found in 23 victims (30.7%), among open injuries — in 19 victims (23.3%).

3. The majority of victims of road accidents (90.7%) got high quality emergency medical aid in a timely manner. In 9.3% of cases, it was insufficiently qualified due to an incorrect assessment of the severity of the condition and, as a consequence, due to non-implementation of anti-shock measures.

4. The scope of the provision of emergency medical care to victims of road accidents included the implementation of temporary hemostasis, treatment of wounds and anti-shock measures.

5. The following number of victims were evacuated from the accident scene to trauma centers: Level III — 24.0% of victims; Level II — 48.0%; Level I — 28.0% of victims.

6. Complications in the form of purulent-septic processes were observed in 16.0% of victims.

7. Competent and timely implementation of anti-shock measures determined an insignificant mortality rate — 4.0%.

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