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FREQUENCY AND STRUCTURE OF TRAUMATIC INJURIES OF THE BRAIN AND FACIAL AREA OF THE SKULL IN ROAD TRANSPORT ACCIDENTS

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ABOUT ARTICLE

Key words: road traffic accident, injuries to the cerebral and facial parts of the skull, combined craniofacial injuries, rehabilitation of patients.

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Abstract: Relevance and goals. The article is devoted to the study of the frequency and structure of injuries to the cerebral and facial parts of the skull in victims of road traffic accidents (RTA), as well as consideration of the issue of rehabilitation of patients with these injuries. The annual increase in road traffic injuries - one of the most important medical and social problems of our time - determines the relevance of this study.

INTRODUCTION

Statistical analysis of data obtained from a retrospective study of medical records of 2152 road traffic accident victims forms the basis of this study.

The article presents a statistical analysis of data on some medical and social indicators: gender and age structure, social status of the victim in an accident, category of road user, intoxicant use, structure of traumatic injuries, etc. The main attention is paid to the concept of maxillofacial injuries, which make up a significant proportion in structure of road traffic injuries: the structure of injuries to the facial skeleton is considered, a classification of combined craniofacial injuries is given depending on the severity, nature and location of the injuries received; the principles and essence of providing emergency care to victims with these types of injuries are considered. The characteristics of the types of specialized treatment for injuries of the maxillofacial area are given. The connection between the timing of medical care and the processes of recovery of victims after an accident is indicated, indicating the characteristics of the course of the rehabilitation period in the case of timely or delayed surgical intervention.

During the analysis, categories of persons from the total number of victims in road accidents with a pronounced predominance of combined craniofacial injuries were identified. A direct dependence of the processes of medical rehabilitation and psychological rehabilitation of patients after an accident on the quality, volume and timing of pre-hospital medical and specialized medical care has been established. The feasibility and effectiveness of a comprehensive examination and treatment of victims of road accidents has been determined. The intended areas of application of the results of this study are maxillofacial surgery, neurosurgery, and traumatology.

Road traffic injuries have recently been subjected to careful analysis and are one of the most important unresolved problems of modern society, and therefore are becoming increasingly relevant. Every year in Uzbekistan, as a result of road traffic accidents (hereinafter referred to as RTA), about 6 thousand people die and about 20 thousand people are injured of varying degrees of severity, with slight fluctuations in data from year to year, including about 1.1 thousand deaths and 4 thousand wounded children.

Mortality rates from road accidents tend to increase annually. The number of deaths per year in road traffic accidents in Uzbekistan, according to the results of studies by various authors, is 2-3 times higher than similar indicators in economically developed countries of the world.

In addition, road accidents are one of the main reasons for hospitalization, and often disability , for victims with skeletal injuries, including both the brain and facial skull. In such cases, victims of road accidents experience combined injuries, but, as a rule, they are combined with damage to various parts of the skull, soft tissues, blood vessels and nerves.

Combined injuries of the brain and maxillofacial region due to the high prevalence of road traffic injuries are a serious interdisciplinary medical problem. Specialists from various fields - neurologists, neurosurgeons, dentists, otorhinolaryngologists and ophthalmologists - take part in the examination and treatment of this category of patients. The presence of multiple and combined injuries within the same anatomical area causes mutual aggravation and the emergence of new manifestations of injury. The absence of a general scheme for examining victims, which would eliminate duplication of diagnostic procedures and prevent the possibility of developing dangerous complications, determines an increase in time and economic costs for examining patients, complicates the interaction of specialists and leads to an increase in the number of diagnostic and treatment errors, which subsequently affect the processes of rehabilitation of victims.

The purpose of the study is to study the frequency and structure of injuries to the facial and cerebral parts of the skull in victims of road accidents in the Penza region and to identify the proportion of maxillofacial injuries; to investigate the problem of rehabilitation of patients with combined maxillofacial injuries, depending on the quality and timing of specialized medical care.

MATERIALS AND METHODS

The basis of the study at the first stage is a retrospective analysis of medical records of 2152 patients with traumatic injuries received as a result of road traffic accidents in Tashkent for the period from 2018 to 2023. The structure of road traffic injuries determined the choice of the object of study at this stage of the analysis: there were The medical histories of patients undergoing examination and inpatient treatment in the departments of maxillofacial surgery, neurosurgery and traumatology at the TMA multidisciplinary clinic were studied. Of the total number of patients injured in road accidents, the percentage of victims with maxillofacial injuries was identified. Taking into account the neurodental focus of our study, when copying information from medical documents, we took into account cases of combined injuries to the maxillofacial region and the brain.

At the second stage, in order to study the problems of rehabilitation of patients injured in road accidents, a retrospective analysis of the volume and content of medical care for victims who were undergoing inpatient treatment at the Department of Maxillofacial Surgery of the TMA multidisciplinary clinic was carried out. We studied 112 case histories of patients with injuries to the maxillofacial area, including combined craniofacial injuries.

Statistical processing of research results was carried out using unified Microsoft computer programs Excel and Statistica 6.0. When interpreting statistical tests, the maximum probability of error (minimum level of significance) was considered to be $p < 0.05$.

RESULTS AND DISCUSSION

Of the total number of patients injured in road accidents (2152 people) who were hospitalized in the period from 2018 to 2023, the share of victims with injuries to the facial and cerebral parts of the skull accounted for 20.81% (1163 people). The study of this group of patients according to the main medical and social indicators revealed a number of characteristic features.

As a result of road accidents, men were injured 10 times more often than women: among those hospitalized with maxillofacial injuries, the proportion of injured men was 91.15% (989 people), women - 8.85% (174 people). This ratio was observed in all age groups of the working population.

An analysis of the age structure of victims revealed a predominance of people of working age in the category from 20 to 40 years, whose share was 70.32% (898 people). According to the graph, the maximum age at risk of injury is in the range of 20-32 years.

The largest share in the social structure of victims of road accidents was made up of the non-working population. Unemployed citizens accounted for more than 50% of the analyzed cases (662 people), pensioners - 3.53% (46 people). A significant percentage of injuries received - 5.88% (75 people) - was noted among students who constitute a risk group in the structure of children's road traffic injuries. The share of the working population in the structure of people who received maxillofacial injuries in road accidents was 37.93% (484 people).

According to the data, the most injured category of road users are vehicle passengers. The total share of injured passengers accounted for more than 46% of cases of maxillofacial injuries. The number of passengers who were in the front and back seats of the car at the time of the accident is approximately the same percentage. The proportion of persons participating in road traffic as drivers and pedestrians was 23.26% (297 people) and 20.83% (266 people), respectively. Motorcyclists, due to their particular susceptibility to injury during collisions and rollovers, also make up a significant group of victims - 123 people (9.63%).

Quantitative indicators characterizing the number of injured road users naturally reflect the ratio of the number of injuries received depending on the mechanism of their occurrence. Due to the equal ratio of injured drivers and front seat passengers, the most common were maxillofacial injuries resulting from a collision with the windshield of a car (429 victims).

Seasonal fluctuations in the incidence of maxillofacial injuries reflect general patterns in the frequency of road traffic accidents. The majority of traumatic injuries (416 cases) occurred in the summer, and the category of vehicle passengers (194 people) was the most susceptible to injuries in the summer.

An analysis of the hospitalization of road accident victims shows that the vast majority of victims - 960 people (75.2%) - were taken to medical institutions by mobile ambulance teams.

A study of the material in terms of intoxicant use revealed a relatively small percentage of people who were intoxicated at the time of the accident - 4.07% (52 people). In 24 cases, alcohol intoxication was recorded among working people. Among the victims with injuries to the facial skeleton while intoxicated, 26 people were passengers of vehicles, 12 people were drivers of the vehicle.

In the process of analysis, the structure of traumatic injuries to the maxillofacial region, including those in combination with brain injuries, in victims of road accidents was determined.

All victims had injuries to the bones of the facial skeleton (Fig. 6). Patients with isolated and combined fractures of the lower jaw predominate - 902 (70.60%) victims. Isolated fractures of the zygomatic bone were diagnosed in 27 (2.10%) patients, and injuries of the zygomatic bone involving the upper jaw were found in 157 (12.30%) patients. Combined injuries involving the upper and lower jaws, zygomatic arch, and nasal bones were detected in 191 (15%) patients. Concomitant injuries to the teeth and alveolar process were noted in 295 (23.10%)

sick. Concomitant fractures of the nasal bones were observed in 71 (5.55%) patients, fractures of the orbital bones - in 20 victims. Bruises and multiple contusions of the soft tissues of the face were diagnosed in all those injured in road accidents.

Almost all victims had injuries to the soft tissues of the head, but traumatic brain injury was confirmed in only 15% of patients: 191 patients were diagnosed with injuries to the maxillofacial area in combination with mild traumatic brain injury.

All victims with traumatic brain injury (191 people) had fractures of the upper jaw. In addition to fractures of the upper jaw, 151 victims were diagnosed with fractures of the wall of the maxillary sinus. Zygomatic bone fractures were found in 101 patients with concussion. Mild traumatic brain injuries were diagnosed in 60 patients with fractures of the lower jaw (31.41% of all patients with a similar pathology); It is characteristic that all these patients had bilateral fractures or fractures of the articular process. The proportion of concomitant fractures of the nasal and orbital bones was 37.17% (71 people) and 10.47% (20 people), respectively.

Thus, analysis of the most characteristic relationships between maxillofacial and craniocerebral injuries indicates a high probability of developing mild traumatic brain injury (concussion) in the case of fractures of the upper jaw and multiple injuries.

The results of the study confirmed the general patterns of frequency and structure of isolated and combined maxillofacial injuries: the predominance of injuries to the facial skeleton in men of the most working age from 20 to 40 years, a large proportion of unemployed citizens in the social structure of victims and passengers in the structure of injured road users, the predominance isolated and combined injuries of the lower jaw, as well as a high percentage of combined craniofacial injuries.

Due to the socio-economic significance of the problem of road traffic injuries, the treatment and rehabilitation of patients with injuries to the facial skeleton are of great interest. For this purpose, the organization of medical care for 40 victims at the prehospital and hospital stages of treatment was studied according to a retrospective analysis.

All victims were aged from 18 to 47 years, the most numerous were the age range of patients from 20 to 29 years (26 people). The majority of victims were male (37 people). In all analyzed cases, the victims were taken to the hospital by ambulance teams.

It should be noted that diagnostic errors by emergency medical teams, ineffective emergency care, and indiscriminate transportation of victims from one medical institution to another are common causes of death and disability in victims with combined craniofacial trauma.

According to the results of our analysis, all victims with combined injuries underwent a set of diagnostic measures, including: a clinical examination by a neurosurgeon, maxillofacial surgeon and related specialists (otorhinolaryngologist , ophthalmologist); radiography of the brain and facial skull in direct, lateral, anterior semi-axial projections (if necessary, in other special settings); computed tomography or nuclear magnetic resonance imaging; cytological and biochemical examination of blood, cytological and biochemical examination of cerebrospinal fluid; hemodynamic parameters were determined and other additional research methods were performed according to indications.

The diagnosis of a fracture was made only after an X-ray examination, carried out in the presence of signs of a fracture: pathological mobility, symptom of indirect load, Vincent's symptom , presence of deformation, etc. The conclusion about the possible presence of a brain injury in a patient was made in the presence of relevant complaints (headache, dizziness, diplopia), anamnestic data (loss of consciousness, vomiting), and examination results. If a severe or moderate traumatic brain injury was suspected, an additional examination was performed (computed tomography of the head, echoencephaloscopy). When only the fact of impaired consciousness, amnesia, nausea, vomiting, headache and dizziness, and subjective autonomic disorders was established, a diagnosis of mild

traumatic brain injury was made. After making diagnoses regarding the condition of the brain and maxillofacial region, the leading component of the injury was determined.

According to our analysis, all victims had injuries to the soft tissues of the head, but mild traumatic brain injury was confirmed only in 12 (30%) patients. In all analyzed cases, injuries to the bones of the facial skeleton were diagnosed, accompanied by damage to the soft tissues of the maxillofacial area. Fractures of the upper jaw were detected in 11 (27.5%) patients, isolated fractures of the lower jaw were found in 16 (40%) patients. Fractures of the zygomatic bone and nose were observed in four (10%) patients, and multiple injuries involving the upper and lower jaws, zygomatic arch, and nasal bones were observed in nine (22.5%) patients. Concomitant injuries to the teeth and alveolar process were diagnosed in 31 (77.5%) patients.

As a rule, with combined injuries, damage to the facial bones is not detected in a timely manner, and specialized treatment is postponed until the period of stabilization of the basic functions of the body, i.e. up to four to seven days after injury, are often carried out in insufficient quantities. Moreover, no one pays attention to decayed teeth and damage to the upper and lower jaws. In this regard, subsequently, victims experience a large number of inflammatory complications, gross functional and cosmetic disorders arise, the elimination of which requires long-term, not always effective, surgical and conservative treatment.

If the time frame for providing medical care extends to 10-15 days, then difficulties arise in the reduction and fixation of bone fragments, and the consolidation processes increase over time. Subsequently, this leads to persistent residual effects. If medical care is provided after 40 days or more, the prognosis for recovery processes is not very favorable: this leads to a large number of complications (up to 20%), an increase in the duration of treatment, its multi-stage nature and high disability .

In the cases we analyzed, measures aimed at immobilizing jaw fragments (reposition and immobilization of fragments with dental splints, application of a sling bandage) were carried out in more than half of the victims (27 people, or 67.5%) on the third day or later from the moment of admission. Primary surgical treatment of wounds of the maxillofacial area was performed on the first day within two hours from the moment of admission in 100% of the victims.

Postoperative complications after fractures of the facial skull bones were observed in 11 patients, of which 12.4% were victims with post-traumatic deformities, and 18.7% were victims of post-traumatic osteomyelitis of the facial skull bones. As is known, these complications are associated mainly with deficiencies in the provision of medical care to victims at the stages preceding specialized medical care.

Thus, during the study, we identified a connection between the timing of medical care and the rehabilitation of victims after an accident. Thus, if surgical intervention occurred immediately or in the first days after injury, then the percentage of inflammatory complications was lower and, as a rule, gross functional disorders and cosmetic defects did not occur.

CONCLUSIONS

1. The prevalence of maxillofacial injuries received as a result of road accidents is 23.86% of the total number of injured in car accidents. The pronounced predominance of males in the most able-bodied age category from 20 to 40 years old confirms the socioeconomic significance of the problem of maxillofacial injuries due to the presence of labor losses and significant economic costs for the rehabilitation of patients.
2. Indicators of the mechanism of occurrence of maxillofacial injuries during an accident are directly dependent on the category of the victim as a road user. Most often, front seat passengers (23.26%) and vehicle drivers (23.26%) are injured as a result of hitting the windshield of a car.
3. The structure of victims in road accidents with maxillofacial injuries is dominated by patients with isolated and combined fractures of the lower jaw (70.60%). The incidence of combined maxillofacial and craniocerebral injuries is 15% of the total number of patients with injuries to the facial skeleton. The highest likelihood of developing a traumatic brain injury is in the case of fractures of the upper jaw and multiple injuries.
4. The processes of rehabilitation of patients after an accident are directly dependent not only on the quality and volume of surgical and conservative interventions, but also on the timing of specialized medical care. The timeliness of treatment measures determines the further course of damage in the direction of accelerating treatment and recovery processes.

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