

## STUDY ON ROAD ACCIDENTS WITH MULTIPLE VICTIMS

Mădălina Diana DAINA<sup>1</sup>, László FEHÉR<sup>1</sup>, Lucia Georgeta DAINA<sup>1</sup>

<sup>1</sup>University of Oradea, Faculty of Medicine and Pharmacy, Street Piata 1 Decembrie, no.10, Oradea, Romania

### RESEARCH ARTICLE

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#### Abstract

Road accidents with multiple victims represent an important public health problem. Constant attention is required for optimizing secondary prevention, which includes prehospital and hospital emergency medical care. The provision of specialized medical first aid at the scene of the event and during the entire transport, contributes to the reduction of complications related to trauma and mortality rate. The purpose of this research is the analysis of the characteristics and particularities presented by multiple victims of pre-hospital and hospital road accidents. The analysis shows the characteristics of patients who are multiple victims of road accidents, predominating: men, the elderly and people from the urban environment. The main causes of accidents are high speed and the use of drugs and alcohol. The severity of the injury placed most of the victims in yellow emergency code. The vast majority of road accidents involved fewer than 5 victims. Most of the victims were transported to the hospital with B1/B2 ambulances. A large part of the patients presented polytraumas being admitted to the hospital on surgical wards.

**Keywords:** road accidents, multiple victims, emergency medical care

#Corresponding author: [lucidaina@gmail.com](mailto:lucidaina@gmail.com)

#### INTRODUCTION

The accident or incident leading to multiple victims is a major event, caused by various factors that generate an exceptional situation. Victim is the person whose health status is affected due to different factors that cause the accident (WHO, 2014).

The provision of medical assistance is carried out through special actions aimed at saving life and preserving health (OG 2001, 2004, 2008, 2013). This includes two stages: the pre-hospital stage (at the scene of the accident - in the outbreak or the place of the disaster) and the hospital stage (medical and sanitary units specialized in the treatment of emergencies).

Hospitals where the examination of victims in the disaster area is carried out organize the reception and intra-hospital medical triage of patients, stabilization, hospitalization, provision of qualified medical assistance, as well as the treatment for those who need it (Kumar, 2021; Mohammed 2019).

If there is an incident with multiple victims or a disaster, an imbalance between the need to provide medical assistance and the reduced capacities to ensure the medical and sanitary resources available at the time is created, which is maintained for a certain period of time (Anjuman, 2020). In such

conditions, providing full medical assistance to all affected victims is impossible. This fact requires the concentration of efforts to provide medical assistance primarily to victims who present an advanced emergency code, but who have real chances of survival at the same time (Kumar, 2013; Sinha, 2017).

The process of identifying victims according to the priority of providing medical assistance and their evacuation is carried out through medical triage both in the pre-hospital and hospital (Shetty, 2012; Souto, 2016). Victims resulting from the accident who will continue treatment in the hospital are distributed according to the clinical condition, the degree of emergency for medical assistance (Zhang, 2016).

The purpose of this research is to carry out an analysis with the characteristics and particularities presented by multiple victims of pre-hospital and hospital road accidents.

#### MATERIAL AND METHOD

An observational, retrospective and descriptive study was carried out, based on the patients medical documents, obtained after a prior agreement with the hospital. Medical data were collected from the hospital computer system, examination and observation sheets. The study period was the year 2023, at the level of Bihor county, 137 serious road

accidents were recorded, with a number of 117 seriously injured people and 41 dead people. From the total number of road accidents, the patients were selected for care. Medical data were complete. Thus, 89 patients (multiple victims) resulting from 36 accidents were selected. The age group of the patients was between 1 year and 85 years.

## RESULTS AND DISCUSSIONS

The demographic characteristics of the patients, multiple victims are: male (34%), urban environment (65%), age between 1 year and 85 years (table 1).

Table 1  
Demographic characteristics of patients, multiple victims

Demographic characteristics	No.	%	
gender	male	46	54%
	female	39	46%
residence	urban	29	35%
	rural	56	65%
age	< 15 years	9	11%
	16-28 years	23	27%
	29-45 years	11	13%
	46-70 years	14	16%
	> 70 years	28	33%

The number of victims involved in each accident varied between 2 victims and more than 15 victims (figure 1).

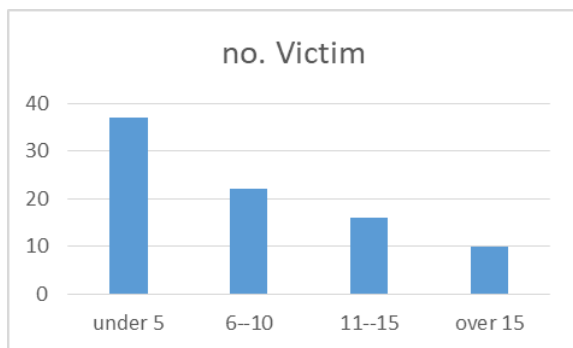


Figure 1. The number of victims involved in each road accident

From severity and nature of the injuries point of view, at the arrival of first aid and resuscitation crews, code yellow prevailed. Code Yellow - signifies the existence of a moderate emergency, the victim has serious or medium injuries, ailments, poisoning or contamination, with preserved vital functions, but with the risk of developing life-threatening complications in the near future. This type of victims requires urgent medical attention, but not immediately (figure 2).

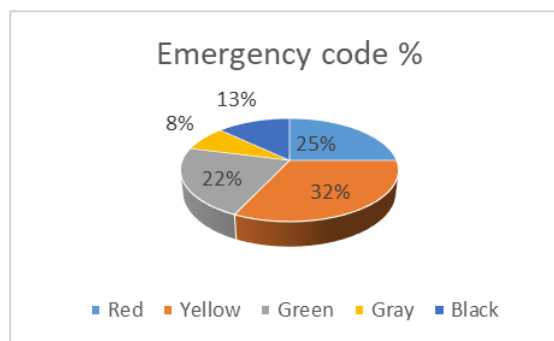


Figure 2. Distribution of victims according to the color code of the emergency

The most frequent causes of road accidents with multiple victims were: high speed (29%), drug and alcohol consumption (27%), health problems (17%), bad weather (14%), technical failure (9%), other causes (4%).

When first aid crews arrived at the scene of the accident, 42% of the victims had a favorable evolution, 39% had a stationary evolution, and 19% had an unfavorable evolution.

From the total number of victims with unfavorable evolution (14 victims), at the arrival of the first aid, extrication and resuscitation crews, 3 victims were found in cardio-respiratory arrest, 5 victims entered cardio-respiratory arrest during transport to the hospital, and 6 victims went into cardio-respiratory arrest at the hospital. Of the 14 victims who went into cardiorespiratory arrest, 11 victims died.

The type of trauma suffered by all the victims involved in the study, including those who died, is represented in figure 3.

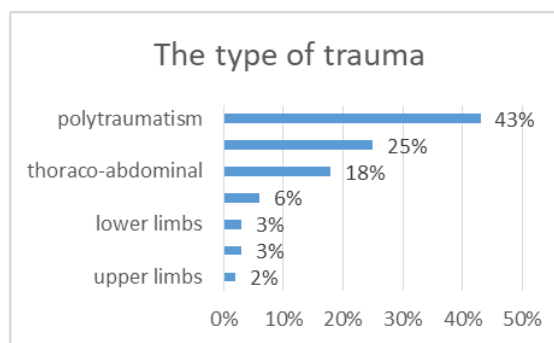


Figure 3. Distribution of patients according to the type of trauma suffered

From the total number of multiple victims, 53 patients were transported to the hospital with qualified crews that arrived at the scene of the intervention. 15 patients did not require transport to the hospital, receiving

medical care at the scene of the accident. The type of ambulances involved in transporting victims to the hospital is shown in figure 4.

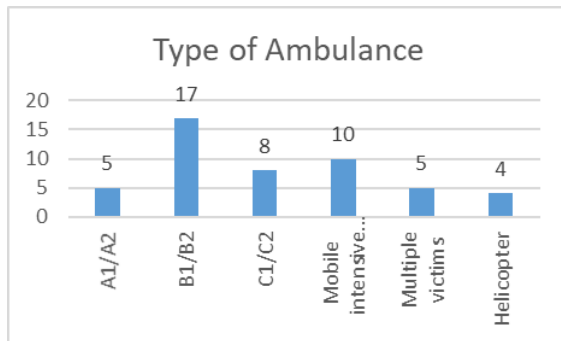


Figure 4. Types of ambulances (number) involved in transporting victims to the hospital

A large number of special medical personnel was involved in providing first aid and reviving the victims: doctors, nurses, paramedics, paramedics and firefighters (figure 5).

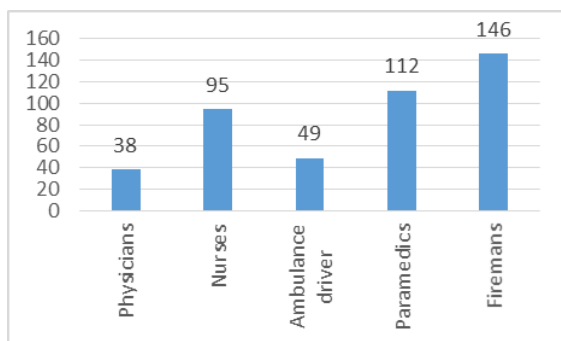


Figure 4. Number of specialists involved in rescuing victims resulting from road accidents

During transport, patients were placed in a vacuum mattress and immobilized with standard cervical collars, they had a large-caliber venous line installed, and depending on the needs, symptomatic and specialized treatment was administered.

From the total number of multiple victims, a group of 37 patients were diagnosed with polytraumas, from which: 29 patients were admitted directly to different wards, 6 patients were discharged home with recommendations and 2 patients refused hospitalization on their own responsibility. According to the current polytrauma protocols, patients with multiple traumas are admitted to Surgery I department or Intensive Care Department, within the clinic, and if they do not have predominant injury on the abdomen, but they have injuries without a surgical indication they are sent in other departments.

After sorting the patients with polytraumas, 65% of them were admitted to other surgical departments (neurosurgery, thoracic surgery, orthopedics, interventional cardiology) and only a 35% percentage were admitted to Surgery Department I/ Anesthesia and Intensive Care Department.

In the preoperative period, the existence and severity of lesions needs to be evaluated correctly with as much precision as possible. Thus, after clinical examination, ultrasound, imaging and laboratory investigations of the victims, a score in which the degree of lesions severity was assessed in order to determine the type and urgency of the surgical measures to be taken later (Subedi, 2014).

Related to the presence of injuries, thoracic injuries predominated in hospitalized patients were in a proportion of 38%, followed by cranio-cerebral injuries without a surgical indication in a proportion of 20%. Regarding intra-abdominal organ injuries, liver lacerations were diagnosed in 4 patients and accounted for 12%, ranking first, followed by splenic lacerations with 2 cases (6%), intestinal and mesenteric injuries, and contusions of the anterior abdominal wall constituted 6% each, and 12% were represented by other lesions with different locations.

Analyzing the surgical treatment applied for multiple traumas patients, we can highlight that in the case of patients diagnosed with liver laceration (4 patients), only 2 of them underwent surgery, practicing hemostasis by packing and hepatorrhaphy, lavage, drainage, and for the other 2 patients the treatment was conservative. The hospitalized patients with the diagnosis of splenic laceration (2 patients) underwent emergency surgery, splenectomy, lavage, and drainage performed in both cases. In the case of patients with the diagnosis of acute surgical abdomen, intestinal injury and mesenteric injury, surgical intervention was also performed, in emergency mode, practicing as needed - enterorrhaphy, implicitly mesenterorrhaphy, lavage, drainage.

## CONCLUSIONS

Trauma continues to represent a major threat to public health in all age groups, more in the active population. Differences in the complexity and severity of traumatic injuries are a really difficult problem for clinicians around the world, and therefore advanced health care methods and periodic renewal of

care protocols for patients with multiple traumas are needed in order to reduce the morbidity and mortality rate.

The analysis shows the characteristics of patients who are multiple victims of road accidents, predominating: men, the elderly, and people from the urban environment. The main causes of accidents are high speed and the use of drugs and alcohol. Most of the victims are placed in yellow emergency code due to the severity of the injury.

The vast majority of road accidents involved fewer than 5 victims. Most of the victims were transported to the hospital with B1/B2 ambulances.

A large part of the patients that presented polytraumas were admitted to the hospital on surgical wards.

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