Traffic Traumatism Resulting in Deadly Consequences in the Region of Banjaluka

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ABSTRACT

Introduction: Traffic accidents are a global problem, in which over 1.2 million people on the planet are killed annually. Detailed consideration of these issues is necessary in order to take appropriate preventive measures.

Patients and methods: In this retrospective study we used the material of the Department of Forensic Medicine Banjaluka. We have analyzed the data of autopsies of people killed in traffic accidents during the period of 2010 - 2012. We examined the gender and age distribution, type and distribution of injuries, the cause of death for certain groups of participants in traffic, and the presence of alcohol in the victims. Data on the alcohol use were obtained from the Forensic Unit of Ministry of Internal Affairs of Republic of Srpska (gas chromatography).

Results: Of 186 autopsied, 160 (86%) were male and 26 (14%) women. Two particularly vulnerable groups were the third decade of life and older age. Head injury is the most common cause of death (45.7%). Drivers (32.3%) and pedestrians (28%) were the most common victims, and in both groups the leading cause of death was head injuries. Their distribution of injuries is similar, with more frequent injuries to the spine, pelvis and lower extremities of pedestrians.

Conclusion: Victims are more frequently men, and out of 60 victim drivers 58 were male! Is it because of the higher incidence of men in the group of drivers and also their behavior in traffic? Number of victim drivers probably was something higher, but unfortunately, in some cases the prosecution is not seeking for the autopsy. Of the total number of victim drivers, 41.7% belonged to the third decade of life. The most common cause of death was head injury. The two most vulnerable groups are drivers and pedestrians, with dominant head and chest injuries. Alcohol abuse is a significant part of the problem. Results of this study generally do not deviate from the data found in the world literature.

KEYWORDS:

Victims of traffic accidents, autopsy, cause of death, head injuries

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Introduction

As a side effect of the expansion of traffic there was a problem of traffic traumatology, which has long since reached the proportions of global epidemic. Over 1.2 million people are killed in traffic accidents worldwide per year, while the number of injured is up to 50 millions.^{1,2} In developed

countries in recent years there is a tendency to reduce the number of casualties in traffic accidents.³ In developing countries, pedestrians make up nearly 40% victims, while in some parts of Africa the percentage goes up to 55%.⁴ Approximately half of all victims are pedestrians, cyclists and motorcyclists, the three most vulnerable groups

of traffic users, which is also more evident in the less developed countries.⁵⁻⁸

The aim of the study to consider the representation of deaths and specificity of injuries in certain groups of traffic participants and to identify risk groups. These information are necessary for the design and taking any preventive actions aimed at increasing of traffic safety and reducing the number of casualties.

Patients and Methods

In this retrospective study we used the data from autopsy reports of deceased participants in traffic accidents, autopsied at the Department of Forensic Medicine of Republic of Srpska in Banjaluka, in the period of 2010 – 2012. We examined the gender and age distribution of the deceased, the type and distribution of injuries, and the cause of death for certain groups of traffic users. The research included serious injuries which, according to the characteristics and localization, directly or indirectly endanger lives of the injured. The Criminal Law of Republic of Srpska classifies these injuries as severe or qualified form of severe body injuries.⁹ Superficial injuries of the skin and subcutaneous tissue (abrasions, bruises, contusions, lacerations), which were numerous in almost all victims, were not the subject of this study, as they are of importance in determining the mechanism of injury, but have an insignificant effect on the mechanism of death.

Results

Out of a total of 462 autopsied during the observed period, 186 (40.2%) were fatally injured traffic users; 160 (86%) men and 26 (14%) women. In relation to the type of traffic users, most of fatally injured were drivers (total of 60, of whom 58 men!), followed by pedestrians (52, 14 of whom were women), front seat passengers (28), rear seat passengers (16), motorcyclists (14), cyclists (13) and three tractor drivers. According to the age there were two noticeable peaks: the third decade of life and older age (the seventh decade and older).

Figure 1. Distribution of victims according to age

From a total of 60 fatalities of drivers, 25 or 42% were aged 20 -29 years (figure1). Generally speaking for all participants, the most common cause of death were head injuries (46%), followed by polytrauma (26%) and chest

injuries (24%). Among other causes (< 5%) were abdominal injuries and asphyxia. The two main groups of fatally injured traffic users were drivers (32%) and pedestrians (28%). Co-drivers have a similar distribution of injuries and causes of death. Of 28 died co-drivers, in 12 cases the cause of death was head injury and in 11 cases chest injuries, which are the most frequently injured body parts. Out of 60 fatally injured drivers, in 47 of them blood alcohol concentration at the time of the accident was measured. Of these, 26 (55%) had a blood alcohol concentration above the legal limit (more than 0.3‰ for drivers). Of 52 pedestrians killed, in 39 of them alcoholemia was measured. In 22 (56%) of pedestrians the illegal blood alcohol concentration was found (over 0.8 ‰ for pedestrians).

Discussion

Men are more frequently victims (85%), which could only partly be explained by their greater participation in traffic. In the world literature such drastic gender distribution was registered in the work of Indian authors, the population of New Delhi.¹⁰ The fact that out of 60 died drivers, 58 are male, and only two women, perhaps tells the story about the behavior of male drivers in traffic. Nearly half of the killed drivers are in the third decade of life.

Studies conducted globally show that the number of pedestrian deaths in traffic accidents varied significantly and were inversely proportional to the development level and economic well-being of society. In highly developed countries, pedestrians make up about 15% of the total fatalities in traffic accidents, in middle developed countries about 29%, while in some African regions even 55% of the total number of dead traffic participants.^{5, 6} In our study, pedestrians make up 28% of the total number of deaths in traffic accidents.

Increased representation of casualties among the elderly could be explained by their reduced dexterity, agility, concentration, attention and generally weaker immunity to trauma. However, to explain the increased number of casualties in the third decade of life, it would be necessary to take into account the temporal distribution of injury (days of the week, time of day or night), the role of alcoholism and intoxication, and possibly link it to risky behavior modes.

The most common cause of death among drivers and pedestrians is head injury, followed by polytrauma and chest injuries, which is in line with numerous researches.¹¹⁻¹³ This confirms the view that head of pedestrians, in spite of improvements in protection systems and stricter legislative regulations, remains insufficiently protected.¹⁴⁻¹⁸

Conclusion

Drivers and pedestrians are the two most vulnerable groups, with a similar distribution of injuries on the body.

While unfatally injured pedestrians have a certain peculiarities of injuries, which separates them from drivers, in case of death injury these differences fade. However, it is noticeable that abdomen and upper extremities are injured more frequently in drivers, while head, spinal column, pelvis and lower limbs are more affected in pedestrians. More than a half of died drivers and pedestrians were under the influence of law prohibited blood alcohol concentration at the time of injury.

References

1. Department of Violence & Injury Prevention & Disability, Global status report on road safety: Time for action, WHO Geneva 2009.
2. Paulozzi L J, United States pedestrian fatality rates by vehicle type, Injury prevention 2005;11:232-6.
3. 2006 Traffic Safety Annual Assessment – A Preview, www.nhtsa.gov July 2007.
4. World health statistics 2008. Geneva, WHO 2008.
5. (<http://www.who.int/whosis/whostat/2008/en/index.htm>, accessed 7. april 2009.
6. Dulal P, Khadka SB, Victims of road traffic crashes attending the emergency department of Kathmandu Medical College Teaching Hospital, Kat Uni Med Jour 2004; 2(4): 301-306.
7. Naci H, Chisholm D, Baker TD, Distribution of road traffic deaths by road user group: A global comparison, Injury Prevention 2009; 15(1):55-9.
8. Crandall JR, Bhalla KS, Madeley NJ, Designing road vehicles for pedestrian protection, BMJ 2002; 324:1145-8.
9. National Pedestrian Crash Report, U.S. Department of transportation, NHTSA 2008.
10. Krivični zakon RS, Službeni glasnik br. 49/2003.
11. Kumar A, Lalwani S, Agrawal D, Rautji R, Dogra TD. Fatal road traffic accidents and their relationship with head injuries: An epidemiological survey of five years, Indian J of Neurotrauma, 2008; 5(2): 63-67.
12. Schmucker U et al. Real-world car-to-pedestrian-crash data from an urban centre, J of Trauma Management & Outcomes 2010; 4:2.
13. Otte D et al. Injury protection and accident causation parameters for vulnerable road users based on German In-Depth Accident Study GIDAS, Accid Anal Prev 2012; 44: 149-53.
14. Thollon L et al. How to decrease pedestrian injuries: conceptual evolutions starting from 137 crash tests, J Trauma 2007; 62: 512-9.
15. Fredriksson R. et al. Priorities of pedestrian protection – A real-life study of severe injuries and car sources, Accid Anal Prev 2010; 42(6):1672-81.
16. Zegeer CV, Bushell M, Pedestrian crash trends and potential countermeasures from around the world, Accid Anal Prev 2012; 44(1): 3-11.
17. Strandroth J et al. The correlation between pedestrian injury severity in real-life crashes and Euro-NCAP pedestrian test results, Traffic Injury Prevention 2011; 12(6):604-613.
18. Martin JL, Lardy A, Laumon B, Pedestrian injury patterns according to car and casualty characteristics in France, Ann Adv Auto-mot Med. 2011; 55:137-146.
19. Han Y et al. Effects of vehicle impact velocity, vehicle front-end shapes on pedestrian injury risk, Traffic Inj Prev. 2012;13(5):507-18.

Saobraćajni traumatizam sa smrtnim posljedicama u Banjalučkoj regiji

APSTRAKT

Uvod: Saobraćajne nezgode su globalan problem, u kojima godišnje smrtno strada preko 1,2 miliona ljudi na planeti. Detaljnije sagledavanje ove problematike neophodno je radi preduzimanja adekvatnih preventivnih mjera.

Ispitanici i metode: U ovoj retrospektivnoj studiji upotrebljen je materijal Zavoda za sudsku medicinu u Banjaluci, obdukovani nastradali u saobraćajnim nezgodama u periodu 2010. - 2012.g. Posmatrane su polna i starosna distribucija, vrste i distribucija povreda, uzrok smrti za pojedine grupe učesnika u saobraćaju, te prisustvo alkoholisanosti kod nastradalih. Podaci o alkoholisanosti pribavljeni su od Jedinice za forenziku MUP RS (gasnom hromatografijom).

Rezultati: Od 186 obdukovanih, 160 (86%) je muških, 26 (14%) ženskih. Treća decenija života i starija životna dob su posebno ugrožene grupe. Povreda glave je ubjedljivo najčešći uzrok smrti (45,7%). Vozači (32,3%) i pješaci (28%) najčešće stradaju, a kod obe grupe vodeći uzrok smrti je povreda glave. Njihova distribucija povreda je slična, uz češće povređivanje kičme, karlice i donjih ekstremiteta kod pješaka.

Zaključak: Muškarci stradaju znatno češće, a od 60 poginulih vozača, 58 je muških! Da li zbog veće zastupljenosti muških u ovoj grupi ali i ponašanja u saobraćaju? Broj stradalih vozača vjerovatno je i nešto veći, nažalost, u pojedinim slučajevima tužilaštva ne traže obdukciju. Od ukupnog broja poginulih vozača, 41,7% pripada trećoj deceniji života. Povreda glave je najčešći uzrok smrti. Dvije najugroženije grupe su vozači i pješaci, sa dominantnim povredama glave i grudni. Zloupotreba alkohola predstavlja značajan dio ovog problema. Rezultati iz ove studije uglavnom ne odskakuju od svjetske literature.

KLJUČNE RIJEČI:

Žrtve saobraćajnih nezgoda, obdukcija, uzrok smrti, povreda glave