Epidemiologic Pattern of Road Traffic Injuries in Afghanistan, 2013

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ABSTRACT

BACKGROUND: Road traffic injuries (RTIs) have emerged as a major global public health problem. However, burden of RTI is not known in Afghanistan. We aimed to estimate and characterize the burden and types of RTIs in Afghanistan.

METHODS: Using a cross-sectional study design, 1514 road traffic injured admitted in eight regional/provincial hospitals, were enrolled in the study between June and December 2013. A structured questionnaire was used to interview injured ones or their attendants in emergency rooms to collect data on the causes of accidents.

RESULTS: We surveyed 1514 injured and 283 drivers. Mean ± standard deviation age of the patients and drivers were 25.7 ± 14.5 and 32.3 ± 10.4 years respectively. Most accidents occurred on Thursdays/weekends (16.25%). Apparently the proportion of smokers among drivers were 51% (144) while it was 16.5% (247) among injured. Similarly, hashish use was 11% (31) among driver and 1.6% (24) among injured. Cars and motorbikes were involved in 56.4% and 28.3% of cases. Of the injured, 45.3% were pedestrians, 25.7% were passengers, 18.1% were cyclists, and 10.9% were drivers. The reasons for accidents from the injured patients' standpoint were 1.9% due to overloads, 2.8% due to failure to follow traffic signs, 71.6% due to driving over speed limits, 5.6% due to pedestrians on the street, 1.4% due to bad weathers, 7.7% due to bad roads, 8.6% due to poor driving skills and 0.5 % due to poorly maintained vehicles. Lower limb injuries were most common (39.6 %) followed by head injuries (25.1 %). Of all injured, 63.6% were hospitalized, 31.5% were discharged from emergency department, and 4.9% died in the emergency department. The average speed of the vehicles involved in accidents was 59.5 ± 22.10 km/hours. 13% vehicle occupants used seat belts or helmets, and 23.7% vehicles were right-side steering wheel.

CONCLUSION: RTIs in Afghanistan mainly involve young men and often involve pedestrians. To reduce the burden of RTIs, considerable attention of various sectors on road safety measures, human factors and vehicles are needed.

Keywords: Road Traffic Injury; Emergency Department Afghanistan; Pedestrian; Epidemiologic

INTRODUCTION

A road traffic injury (RTI) is any injury originating, terminating, or involving a vehicle partially or fully on a public highway [1]. RTIs have emerged as a major but often neglected public health problem of the century [2]. RTIs are estimated to be the fifth leading contributor to the global burden of disease by 2030 [3]. Over 90% of fatal crashes occur in low and middle-income countries with substantial health and economic consequences [4-8]. The World Health Organization (WHO) estimates that RTIs could match infectious diseases worldwide as a leading source of ill health by the year 2020[9-13].

All age groups are involved in road traffic injuries; however, it affects male at the productive age groups more often. Most accidents occur at evening hours and are more prevalent in crowded public roads involving pedestrians. Careless or poorly skilled drivers who do not pay attention to turning-indicator lights and do not follow speed limits are most common factors responsible for RTIs in India [13]. Travelling in open-back vehicles and/or in overcrowded vehicles and use of alcohol are

among the main factors associated with RTIs [14]. A population survey in Saudi Arabia showed that the overall age-sex-adjusted rate for non-fatal RTI was 20.7/100 persons/ year [15]. Overall RTI rate in Kenya was 59.96 per 100,000 populations in 2009 with vehicle passengers being the most affected [16]. A study in Pakistan found the proportion of injured male at (71%) with 33% of surgical/orthopaedics presentations [17]. Likewise, in a study in Iran the average age of the injured individuals affected by RTIs was 24.7 years and 33.8% of the patients were in 20-29 years' age group. Significant relationship was observed between accident occurrence and season and day of the week [18]. Change in life style, urbanization, over-crowded roads, and mechanization of agriculture lead to increase in mortality, morbidity and injuries due to RTIs in developing countries [19-20].

Afghanistan is ranked third in RTI fatality rates after Egypt and Libya in the Eastern Mediterranean Region (EMR) and males are involved in 80% of RTIs. Unfortunately, seatbelt use, driving with a valid driving license and helmet use are not regularly enforced in the country. Deaths due to RTIs in Afghanistan are 2.5 per 10, 000 vehicles [21]. Suffering from three decades of war and conflict, the country has the highest number of injuries due to war, landmines and unexploded ordinance in the world [22-24]. According to the Surveillance Department at the Ministry of Public Health which collected information from provincial public hospitals only, there were 26,297 reported injuries and 2010 deaths during 2009 and 27,275 injuries and 567 deaths during 2010 [25]. Furthermore, for every death due to injury many people are either hospitalized or treated in emergency [26]. Data from Afghanistan Mortality Survey (AMS) 2010 revealed that injuries (unintentional and intentional) were responsible for 20 % of death among all ages of Afghan male population [27].

There is no injury surveillance system including RTIs in Afghanistan to depict the burden and its causes. Intervention with great impact on preventing injures requires evidence at country level [28]. Although data on the prevalence of RTIs have been reported, there have been no peer-reviewed publications that have examined the patterns of RTIs in the Afghanistan. Therefore, the aim of this study was to estimate the burden and epidemiologic pattern of road traffic accidents in Afghanistan.

METHODS

This study is a descriptive survey of patients coming to emergency room of eight regional and/or provincial hospitals between June and December 2013 for the management of RTIs. The data collection process was conducted by eight surveillance coordinators. The surveillance system in the country was established in 2006 and its activities are coordinated by the surveillance regional coordinators at the regional level and the surveillance directorate at the central level, within the Ministry of Public Health. Each surveillance coordinator had public health training and underwent a brief orientation on data collection process and tools.

Given that the prevalence of RTIs was not clear, for sample size in this study we used the highest possible prevalence of RTIs; 95% confidence interval and 5% band of error. By correction of 10% un-response rate and design effect of 3, the required sample size was 1270. Our inclusion criteria were injury due to RTIs, presentation at an emergency room and consent to be interviewed while the exclusion criteria were non-RTI injuries and lack of consent for interview.

The study was partly funded by the Surveillance Department, Afghanistan National Public Health Institute and partly by the World Health Organization, Kabul Office. The protocol was approved by the institutional review board (IRB) of Ministry of Public Health prior to implementation.

RESULTS

Of the 1514 individuals, 306 (20.2%) were from Kabul, 152 (10%) from Hirat, 200 (13.2%) from Balkh, 152 (10%) from Ghazni, 150 (9.9%) from Kundoz, 201 (13.3%) from Nangarhar, 154 (10.2%) from Parwan, and 199 (13.1%) from Kandahar provinces. According to Table 1, the commonest age groups involved in accidents were 10–20 years and 20–30 years, which together consisted approximately 60% of road traffic injuries.

As illustrated in Table 1, there were no female drivers, 85% of patients were males; 46% of patients and 50.9% of drivers were illiterate; and 47% of patients and 72.2% of drivers were married when the accident happened. Average age of patients were 25.7±14.5 years while average age of drivers involved in accidents were 32.3±10.4 years. Approximately, 90% of drivers were less than 45 years. Around 71% of the drivers hold driving license. Apparently the highest proportion of accidents occurred on

Table 1: Frequency distribution of road traffic injuries according to their sex in eight provinces, Afghanistan - 2013

Variables	Categories	Female	Male	Total Injured	Drivers
		N (%)	N (%)	N (%)	N (%)
Age Groups					
	Less than 10 years	51 (26.3)	143 (73.7)	194 (13.1)	NA
	10 - 20 years	63 (14.2)	380 (85.8)	443 (29.9)	40 (14.3)
	20 - 30 years	55 (12.5)	386 (87.5)	441 (29.7)	96 (34.3)
	30 - 40 years	23 (11)	186 (89)	209 (14.1)	86 (30.7)
	40 - 50 years	13 (13.1)	86 (86.9)	99 (6.7)	41 (14.6)
	50 - 60 years	16 (26.2)	45 (73.8)	61 (4.1)	17 (6.1)
	60 - 70 years	2 (7.1)	26 (92.9)	28 (1.9)	NA
	More than 70 years	1 (12.5)	7 (87.5)	8 (0.5)	NA
Education Level					
	Literate	161 (20.2)	638 (79.8)	799 (54)	137 (49.1)
	Illiterate	59 (8.7)	623 (91.3)	682 (46)	142 (50.9)
Occupation					
	Employees	2 (2.2)	91 (91.8)	93 (6.8)	15 (5.4)
	Students	46 (11.9)	341 (88.1)	387 (28.3)	26 (9.4)
	Self-employed	2 (0.4)	486 (99.6)	488 (35.7)	103 (37.2)
	Business	0	28 (100)	28 (2)	15 (5.4)
	Farmers	2 (1.7)	114 (98.3)	116 (8.5)	NA
	Retired	21 (22.1)	74 (77.9)	95 (6.9)	NA
	Others	47 (29.4)	113 (70.6)	160 (11.7)	118 (42.6)
Marital Status					
	Married	90 (13.1)	596 (86.9)	686 (47.1)	200 (72.2)
	Single	121 (16.1)	630 (83.9)	751 (51.5)	77 (27.8)
	Widow/widower	8 (38.1)	13 (61.9)	21 (1.4)	NA
Driving License					
	Yes	NA	NA	NA	199 (71.1)
	No	NA	NA	NA	81 (28.9)

Table 2: Frequency distribution of behavior/ risk factors for injured and drivers involved in road traffic injuries in eight regional provinces, Afghanistan - 2013

	Injured (no-drivers)	Injured (drivers)
Variables	N (%)	N (%)
Smoking use	247 (16.5)	144 (50.9)
Snuff use	180 (12.1)	59 (20.9)
Alcohol use	8 (0.5)	12 (4.4)
Hashish use	24 (1.6)	31 (11.1)
Heroin use	4 (0.3)	7 (2.5)

Thursdays (16.25%) followed by Monday (15.6%) and Wednesday (14.9%) while the lowest proportion of accidents occurred on Fridays (10.0%) which is weekend in Afghanistan.

Cars were the main vehicles involved in accidents (56.4%) followed by motorbikes (28.3%). Buses, rangers and bicycle were involved in the lowest proportion of road traffic accidents. Of all the injured, 45.3% of injured were pedestrian, 25.7% were passengers, 18.1% were cyclists, and 10.9% were drivers. The perception of vehicle drivers and injured were different about the reasons for accidents. Injured by traffic accidents thought that the reasons for accidents were 1.9% overloads, 2.8% not following traffic signals, 71.6% driving above the speed limit, 5.6% people on street, 1.4% bad weathers, 7.7 % bad roads, 8.6% poor driving skills and 0.5 % due to bad cars. Whereas drivers expressed that reasons for accidents were 2.8% due to overload, 11.3% due to problems with traffic signals, 24.1% due to driving above the speed limit, 39.4 % due to people walking on the roads, 14.5% bad roads and 6.7% poorly maintained vehicles. The highest percentage of injuries affected the lower limbs (39.6%) followed by head (25.1%). Chest and neck was the location with the lowest percentage of injuries. However, 37.3% of injuries occurred on multiple locations (Table 3).

Carrying the patient to health centre/ hospitals has been a problem in Afghanistan. According to response of injured or their families, 68.1% were brought to hospital by taxi, 11.39% by car, 8.51% by police, 6.8% by walking and 5.19%

Table 3: Frequency distribution location and type of injuries for eight regional provinces, Afghanistan -2013

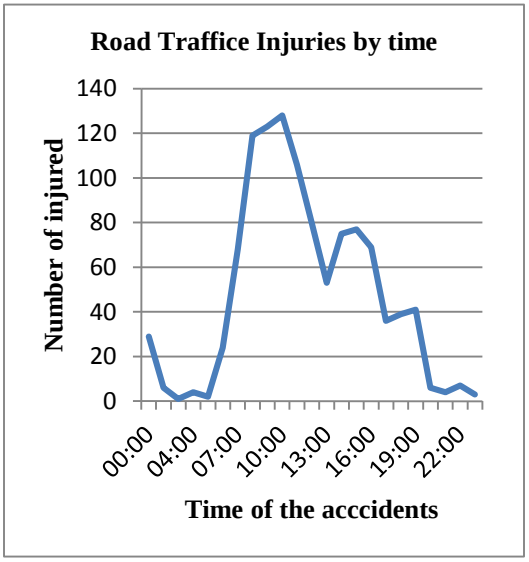
Variables	Categories	N (%)
Location of injuries		
	Head	380 (25.1)
	Neck	55 (3.6)
	Face	118 (7.8)
	Chest	46 (3)
	Abdomen	28 (1.8)
	Upper limb	202 (13.3)
	Lower limb	599 (39.6)
	Multiple	564 (37.3)
Type of injuries		
	Open wound	228 (15.1)
	Blunt injuries	194 (12.8)
	Head trauma	264 (17.4)
	Joint dislocation	125 (8.3)
	Fracture	506 (30.4)
	Ecchymosed	160 (10.6)
	Abrasion	586 (38.7)
	Comatose	119 (7.9)

by ambulances. Of all injured, 63.6% were hospitalized, 31.5% were discharged from emergency department, and 4.9% died while in emergency department. According to the drivers, the average vehicle speed during accidents was 59.5±22.1 km/hour, 13% were using seat belts or helmets, and 23.7% were using right-hand steering wheel vehicles. Most accidents occurred between 7:00 AM and 3:00 PM (Figure 1). Almost 85% of vehicles did not have air bags. Half of the drivers self-reported symptoms consistent with depression while 60% reported maintenance problems with vehicles.

DISCUSSION

Although RTIs are a major public health problem in Afghanistan, it is a neglected area and there is lack of accurate information. During the last three decades of war and conflict, presence of other competing priorities in the health sector may explain this negligence. This is the first published study on epidemiological pattern of road traffic injuries in Afghanistan. We found that various age groups, different occupations, and education levels were involved in RTIs. We found that males were more often involved in the accidents which may reflect the cultural setup in Afghanistan where women don't leave the house as often as men. Countries with similar cultural background, such as India and Iran, also have higher proportion of RTIs involving males [29-30]. We also found that younger individuals were more commonly involved in accidents which may reflect the fact that half of the population in Afghanistan is under age of 18 [31]. Lower limb injuries and head injuries were the main affected areas of the body of which two thirds were hospitalized and 5% died in the emergency room. It is possible that a much large percentage of individuals died due to RTIs as individuals who died at the site of accidents were unlikely to be brought to the emergency department of the hospital. Mortality remains the main concern of RTIs all over the world. For instance, in the Eastern Mediterranean Region, the mortality rate from road traffic accidents was 26.4 deaths per 100,000 populations in 2002, the second highest rate in the world after the African Region [20]. Limited driving skills and high illiteracy rate among drivers might be an important factor in RTIs as most drivers (90%) were younger than 45 years and half were unable to read or write. Further, one third of the drivers did not have driving license, representing lax law enforcement by the authorities particularly traffic police. Although the role of airbag and seatbelt in reducing RTI-associated mortality and morbidity is well-established [32-34], 96% of the

Figure 1: Daily timeline of road traffic injuries



passengers did not use seat belt and airbag were absent in majority of vehicles involved in the accidents [35].

Nearly half of injured were pedestrians which shows a similar observation in a study conducted in India [35]. We found a high incidence of RTIs on Thursday. In Afghanistan, Thursday is the last working day of the week and most people may be traveling and driving hurriedly to complete their tasks or arrive at their destination. Consequently, the roads are overcrowded and making people more susceptible to accidents; findings consistent with other studies from Turkey and India [35-36]. Only 5% victims were transported by ambulances to the emergency department highlighting generally poor access to ambulance service. The role of pre-hospital care system including ambulance services in reduction of mortality and morbidity of the victims have been established through several studies in UK, Nigeria, India, and Iran [37-40]. We found important differences on the perception of the reasons for RTIs between drivers and injured patients. For instance, high speed was the main factor for accident cited by injured while it was given low ranking by drivers. Similarly, drivers blamed pedestrians' presence on street as a significant factor while this was not given same ranking by the injured.

Our study has important limitations. The cross-sectional study design does not allow exploration of a cause and effect relationship. Second, due to the time and resource constraints we were not able to select a representative sample at the provincial level. Third, we were unable to collect follow up data on the fatality of the injured after they were admitted to the hospital.

CONCLUSION

Our study has important public health implications. As the highest casualty was in pedestrians, pavements at the roadside should be built and maintained for pedestrians. Furthermore, as more injuries occurred on Thursdays, more traffic surveillance and monitoring should be considered on Thursdays. Establishment and strengthening of pre-hospital services and deployment of ambulances in the vulnerable and prone to accidents areas is crucial. In addition, strict implementation of traffic law and increasing public awareness should be considered as top priority.

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