

Victims of road traffic crashes attending the emergency department of Kathmandu Medical College Teaching Hospital

Dulal P¹, Khadka SB²

¹Formerly Medical Officer, ²Lecturer, Emergency Department, Kathmandu Medical College, Sinamangal, Kathmandu, Nepal

Abstract

Objective: To study the epidemiological factors and pattern of impact and injuries in victims of road traffic crashes visiting the emergency room of an urban teaching hospital in Kathmandu. **Design:** Retrospective observational study. **Methods and Materials:** Review of medical records of all the victims of road traffic crashes of one year. **Results and Conclusion:** Victims of road traffic crashes formed 6.2% of all emergency attendees of the hospital. Two-thirds of the victims came between midday and midnight. The most vulnerable age group to get involved in the crashes was the 15-to-45-year group, which is also the working age group. Pedestrians constitute approximately 40.0% of the victims. Most of the injuries occurred in the lower extremities. Most impacts were seen in upper and lower extremities or in head/face region. The non-fatal nature of injuries can be attributed to the low velocity at which crashes might have occurred.

Key words: Road traffic crashes; road traffic injuries; emergency department; Kathmandu.

Road traffic injuries (RTIs) are a major cause of death and disability globally, with a disproportionate number occurring in developing countries. RTIs are currently ranked ninth globally among the leading causes of disability adjusted life years lost, and the ranking is projected to rise to third by 2020. Moreover, RTIs in developing countries particularly affect the productive (working) age group (15-44 years) and children. These injuries mostly affect pedestrians, passengers, and cyclists in developing countries as opposed to automobile drivers in the developed world.¹

Road traffic crashes (RTCs) kill about 1.2 million per year or an average of 3242 every day. RTCs rank as 11th leading cause of death and account for 2.1% of all deaths globally. Ninety percent of road traffic deaths occur in low-income or middle-income countries. Countries in WHO South-East and WHO West Pacific Regions account for more than half of all road traffic deaths in the world. For everyone disabled or killed due to road traffic crashes there are countless affected.²

Development and modern living are associated with increase in motor vehicles everywhere, including developing countries like Nepal; accordingly the numbers of motor vehicle related fatalities are also rising.³ This trend is opposite that in developed countries such as United States where, despite

increase in motor-vehicle travel, the annual death rate from RTCs is declining.⁴

Studies involving hospitals, traffic police, and transport authorities can provide important scientific basis to formulate, implement, and monitor the preventive measures taken to reduce such injuries.

In this study, epidemiologic factors related to RTCs presenting to the emergency department of Kathmandu Medical College Teaching Hospital (KMC-TH) and the patterns of injuries sustained by the victims have been studied. KMC-TH is an urban hospital located in the central part of Kathmandu valley.

Methods and materials

This retrospective observational study was conducted from Oct-Nov 2002 to Sep-Oct 2003 AD (Kartik 2059 to Ashwin 2060 BS Nepali calendar). Secondary data was collected from medical records of all the victims of RTCs who had been treated in the emergency department of KMC-TH during that period. Data was collected using checklists and analyzed using statistical tools.

Correspondence

Dr. Prabeen Dulal
PO Box 8604, Kathmandu
Email: prabeen_dulal@yahoo.com

In this study, injuries were basically grouped as abrasions/bruises, incisions/lacerations, fractures, soft tissue injuries, and visceral injuries (pneumo- and/ or hemothorax, intraabdominal injury, urogenital injury) in case of chest, abdomen, and pelvis. Injuries were noted as that of following regions of body: head (H), face/scalp (F), spine (S), thorax (T), abdomen (A), pelvis (P), upper extremities (U), and lower extremities (L). Soft tissue injury was also designated for victims who experienced pain or aching but had no visible external findings.

The definitions for different types of head injuries are as follows:⁵

Trivial: GCS=15, no decreased level of consciousness, and no post-traumatic amnesia.

Minor: GCS=13-15 with witnessed episode of loss of consciousness or with significant post-traumatic amnesia or confusion.

Major: GCS<13.

Types of injury in each affected anatomic region of the body were recorded and also categorized as single or combined-region involvement.

Results

Epidemiological Factors

Of the 9966 patients who had attended the emergency department of KMC-TH during the study period, 615 (6.17%) were the victims of RTCs.

The number of RTI cases was fairly constant throughout the study period and varied in proportion to the total number of emergency attendees. Later half of November to early half of February (months of Mangsir, Poush and Magh in Nepali calendar) had the lowest number of RTI cases whereas mid March to mid May (Chaitra, Basakh and Jeshtha) had lower rates of RTC cases.

Most of the victims of RTCs (74.47%) were brought in after midday till midnight. Individuals between the ages of 15 and 45 years were the most often represented. Children under the age of 14 years formed 18.05% of RTCs. Most of the victims were pedestrians (39.83%) followed by drivers of motorbikes or other vehicles (25.04%). A large number (24.87%) of victims was not categorized in the emergency records. Motorbikes (46.18%) followed by small vehicles, such as taxis, tempos or cars (14.95%), were the most common vehicles associated with RTIs.

Table 1. Monthly distribution of overall attendees and RTC cases.

S.No.	Months	ER cases /month	RTC cases /month	Percentage
1.	Oct-Nov '02 (Kartik 2059)	692	37	5.34
2.	Nov-Dec '02 (Mangsir 2059)	529	48	9.07
3.	Dec-Jan '02/03 (Poush 2059)	600	38	6.33
4.	Jan-Feb '03 (Magh 2059)	692	52	7.51
5.	Feb-Mar '03 (Falgun 2059)	779	48	6.16
6.	Mar-Apr '03 (Chaitra 2059)	896	50	5.58
7.	Apr-May '03 (Baisakh 2060)	951	56	5.88
8.	May-Jun '03 (Jestha 2060)	1074	55	5.12
9.	Jun-Jul '03 (Asad 2060)	1044	67	6.41
10.	Jul-Aug '03 (Shrawan 2060)	1005	70	6.96
11.	Aug-Sep '03 (Bhadra 2060)	861	44	5.11
12.	Sep-Oct '03 (Aswin 2060)	843	50	5.93
	Total	9966	615	6.17

Table 2. Epidemiologic factors of RTC cases

			No. of cases	Percentage
1.	Arrival Time	12-6am	19	3.09
		6-12MD	129	20.97
		12-6pm	228	37.07
		6-12MN	230	37.4
		Not noted	9	1.46
2.	Age Group	<14	111	18.05
		15-30	288	46.83
		31-45	125	20.32
		>45	77	12.52
		Not noted	14	2.27
3.	Victim	Pedestrian	245	39.83
		Driver/Front rider	154	25.04
		Pillion rider	32	5.20
		Passenger	31	5.04
		Not noted	153	24.87
4.	Vehicle	Bicycle	71	11.54
		Motorbike	284	46.18
		Tempo/taxi/car	92	14.95
		Bus/truck/micro van/tractor	46	7.48
		Not noted	122	19.83

b. Patterns of Injuries

The total number of injuries recorded in each region of the body shows that the lower extremities were injured most frequently, followed by the upper extremities and face and scalp. Incisions and lacerations were more common than abrasions or bruises in the face/scalp region.

Head injury was the fourth most common site of injury. The majority (84.05%) of cases of head injury were trivial, and only 2.27% were severe.

In the spine, thorax, and pelvis soft tissue injury was the most common injury seen. In both the upper and lower extremities, abrasions and bruises were the most common injuries, followed by soft tissue injury. In the lower extremities, incisions and lacerations slightly outnumbered fractures and dislocations-just the reverse of the findings in the upper extremities. No injuries were recorded in 9 (1.46%) cases, and 3(0.5%) cases were dead on arrival in the emergency room.

Table 3. Regions of the body and total number of injuries.

Anatomic Region Involved	Total number of injuries
Head	207
Face and Scalp	226
Spine	24
Thorax	65
Abdomen	11
Pelvis	18
Upper extremities	279
Lower extremities	385

Table 4. Types of injuries on different regions of the body.

Regions of Body	Type of injury	No. of injuries	Percentage
Head Injury(H)			
	Trivial	174	84.05
	Minor	19	9.17
	Major	14	6.76
Face/Scalp(F)			
	Abrasion/bruise	75	33.18
	Incised wound/laceration	139	61.50
	Fractures	12	5.30
Spine(S)			
	Cervical#	0	0
	Thoracic#	1	4.16
	Lumbosacral#	3	12.5
	Abrasion/bruise	4	16.66
	Soft tissue injury	16	66.66
Thorax(T)			
	Abrasion/bruise	8	17.77
	Incised wound/laceration	4	8.88
	Pneumothorax/hemothorax	0	0
	Soft tissue injury	21	46.66
	#cervical bone, ribs, sternum	12	26.66
Abdomen(A)			
	Abrasion/bruise	8	72.72
	Incised wound/laceration	0	0
	Intraabdominal injury	1	9.09
	Soft tissue injury	2	18.18
Pelvis(P)			
	Fractures	3	16.66
	Urogenital injury	1	5.55
	Soft tissue injury	14	77.77
Upper Extremities(U)			
	Abrasion/bruise	128	45.87
	Incised wound/laceration	42	15.05
	Fractures/dislocations	49	17.56
	Soft tissue injury	60	21.50
Lower extremities(L)			
	Abrasion/bruise	150	38.96
	Incised wound/laceration	77	20
	Fractures/dislocations	55	14.28
	Soft tissue injury	103	26.75

c. Patterns of Impacts on the Body

Of the total number of victims 281 (45.69%) had impacts on a single region of their bodies while the remainder sustained injuries of multiple parts of the body forming 32 different combinations of sites of impact. The lower extremities, followed by the upper extremities and thorax were the three most common

regions affected singly with 25.66%, 15.12%, and 2.60% of cases respectively. The five most common combinations of regions with injuries were H+F, U+L, H+F+L, H+F+U, and H+F+U+L with 16.42%, 12.68%, 4.87%, 4.55%, and 3.90% of cases respectively. Impacts in a combined form in other parts of the body occurred at a lower rate.

Table 5. Common regions to sustain impacts of injury.

	Region involved	Number of cases	Percentage of total RTC cases
1.	L	164	26.66
2.	U	93	15.12
3.	T	16	2.60
4.	S	5	0.81
5.	A	2	0.32
6.	P	1	0.16
7.	H+F	101	16.42
8.	U+L	78	12.68
9.	H+F+L	30	4.87
10.	H+F+U	28	4.55
11.	H+F+U+L	24	3.90
12.	T+U	10	1.62
	Total	552	

Discussion

The high rate of RTCs during afternoon and evening corresponds to the fact that more people use the roads and are out on the streets during that time. The authors observed that RTCs in which serious types of injuries were seen occurred in the evening when roads are quieter and people drove faster than at other times when the roads are more crowded. Motorbikes and small vehicles such as tempos, taxis, and cars contribute to more than 60.0% of RTCs, which most likely corresponds to their large presence in the valley and their greater speed compared to buses, trucks, or bicycles.

Pedestrian-vehicle crashes were the main cause of injury in this study and the lower limb was the commonest anatomic region to be affected although world-wide, short term intracranial injury ranks as the most common type of nonfatal injury.¹ Pedestrian-vehicle crashes are responsible for more than a third of all traffic-related fatalities and injuries worldwide.⁶ A study done in Ghana also found that pedestrians accounted for the majority of road traffic fatalities in that country.⁷

The pattern of injury seen in this study indicates that most victims sustained nonfatal type of injury and in most RTCs the impact was on the extremities or head/face. The findings that most head injuries were

trivial and the finding that the most common injuries in all anatomic regions were abrasions and bruises or soft tissue injuries can be explained by the fact that most crashes have probably occurred at a low velocity because the roads in the Kathmandu valley are often extremely congested.

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Principal Author: Dr. P. Dulal*, MBBS

Co Principal Author: Dr. S.B. Khadka**, MDGP

Conducted at: Emergency Department of Kathmandu Medical
College, Teaching Hospital (KMC-TH), Sinamangal,

Kathmandu

Correspondence:

Dr. Prabeen Dulal

PO Box 8604, Kathmandu

Email: prabeen_dulal@yahoo.com

Authors: * Formerly Medical Officer, Emergency Department,
KMC- Teaching Hospital;

**Lecturer, Emergency Department, KMC-TH.