

A Study of Transportation Injuries in Central Southern Region of Nepal

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ABSTRACT

Background: Transportation injuries are major causes of morbidity and mortality in underdeveloped countries like Nepal due to poor road conditions and lack of awareness regarding traffic rules. So this study aims to find the pattern of injuries present in road traffic accident cases presented to a tertiary care centre of mid southern region of Nepal.

Methods: A descriptive cross-sectional study was conducted among 400 cases selected among transportation injuries victims coming to emergency department of National medical college and teaching hospital, Birgunj from August 2022 to July 2023. Ethical approval was obtained from Institutional Review Committee (IRC) of the same institute (Ref: F-NMC/566/078-079). Informed consent was taken from victims or their guardians. Data was collected using preformed proforma and analyzed using Statistical Package for Social Science (SPSS) version 2023.

Results: Out of 400 cases of transportation injuries, the most common involvement was of age group of 21-40 years i.e. 199(49.8%). A significant preponderance of incident took place on Saturday 93(23.3%). Two wheelers were present in 212(53%) of incidents. Head on collision was present in majority of cases 184(46%) followed by side collisions 144(36%). Most common injuries in this study were found to be abrasion, present in 111(27.8%) cases followed by multiple injuries in 80(20%). The majority of injuries was present on head & neck region 120(30%).

Conclusion: Road safety preventive measures from the government authority should be implemented to reduce fatality by transportation injuries. Young adults' drivers of two-wheeler vehicles should strictly follow traffic rules.

Keywords: Injuries, road safety, examination, road traffic accidents.

INTRODUCTION

An accident is defined as per WHO as an Un-premeditated event causing recognizable damage (1). Road traffic accidents are one of the most important global public health issues but have been given less attention. Without concrete plan of action regarding prevention of road traffic injuries, cause of death by such injuries is predicted to become on the 7th leading position by 2030

(2). According to a report by Nepal police in the year 2020, among injuries by road traffic accidents, 14.5% resulted into death of the victims (3). Various studies conducted in Nepal revealed two-wheelers motorized vehicle users and pedestrians being the vulnerable road users (4,5). Globally 93.5% fatalities have been reported from low income and undeveloped countries (6). Further the loss of life of wage-earner in the

family results in economic burden to the family and plunges them into the poverty. This study aims to find the pattern of road traffic injuries in the victims presented to the emergency department of National medical College, Birgunj and to observe the pattern of transportation injuries and its association with various factors.

MATERIALS & METHODS

Present study was carried out at the emergency department of the tertiary hospital at Birganj municipality. It is one of the highly populated cities of Madhesh Province. Before starting the study, the ethical clearance was obtained from the institutional review committee of the hospital with reference number F-NMC/566/078-079. A written permission from the head of the emergency department was taken to smoothly conduct the study. The study is descriptive cross-sectional and carried out between August 2022 to July 2023 for a period of one year

Consent was taken before examination and documentation. The persons who were unable to communicate consent, like unconscious patients or whose consent is considered invalid by law like in minor or intoxicated persons, the consent was taken from family members. Sample size was calculated putting the value of prevalence 0.5 in formulae

$$n = Z^2 p (1-p) / e^2$$

$$= (1.96)^2 \times 0.5 \times (1-0.5) / (0.05)^2$$

$$= 384.16 \leq 400$$

Where,

n= required sample size

z= confidence interval (CI) at 95% (standard valve of 1.96)

P= prevalence for maximum sample size calculation, 50% (7)

q = 1-p

e = degree of accuracy desired, 5%

The entire patients with the history any type and severity of injuries due to road traffic accidents presenting to the emergency department were included in this study. All the patient who meet the inclusion criteria were included and data was collected through examination and using preformed proforma which consist of identification data, day and time, cause, relationship between victim and assailant, type of weapon, type and severity of injury, part of body sustaining injury, facture of bone, alcohol intoxication, various treatment and emergency department outcome.

Data was collected using preformed proforma and analyzed using Statistical Package for Social Science (SPSS).

RESULT

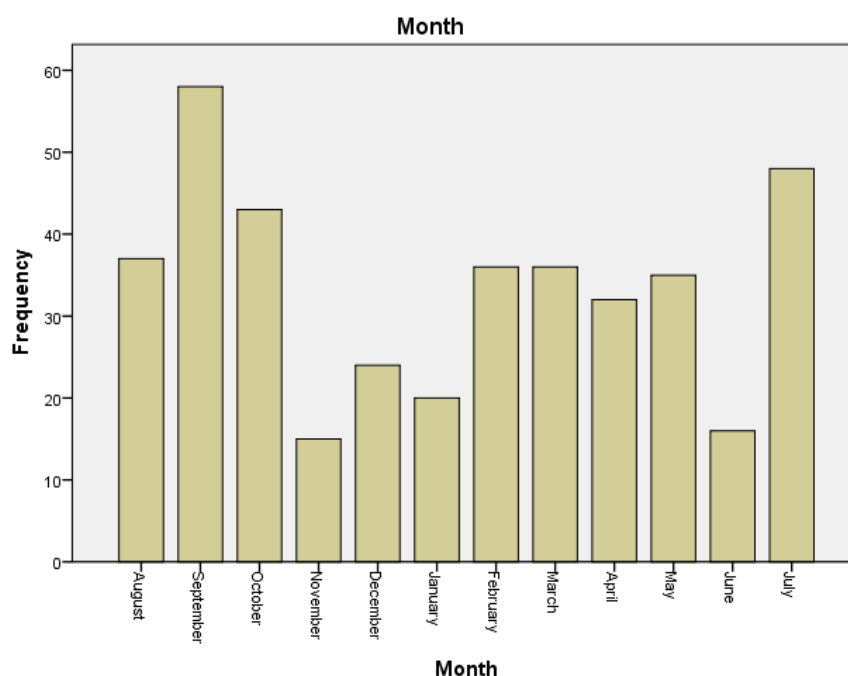
Table 1 shows the demographic profile of transportation injury victims. Among 400 transportation injury victims presented to the emergency department of National medical college and teaching hospital, Birgunj, the most common involvement was of age group of 21-40 years i.e. 199(49.8%) followed by the age group of 41-60 years 115(28.8%). Hindu victims were 304(76%) with comparison to the Muslim population who were only 96(24%). Sex-wise distribution revealed a majority victims being male 312(78%) and only 88(22%) being female. Most of the victims were from Parsa district 160(40%) followed by Bara 116(29%) and Rauthat 110(27.5%). Victims from urban areas were 210(52.5%), whereas victims from rural areas were 190(47.5%). A significant preponderance of incident took place on Saturday 93(23.3%) followed by Friday 78(19.5%).

Table 1: Demographic profile of victims

Variables	Number(victim)	Percentage
Religion		
Hindu	304	76%
Muslim	96	24%
Age		
Below 20	56	14%
21-40	199	49.8%
41-60	115	28.8%

>60	30	7.5%
Sex		
Male	312	78%
Female	88	22%
District		
Parsa	160	40%
Bara	116	29%
Rautahat	110	27.5%
Sarlahi	14	3.5%
Area		
Rural	190	47.5%
Urban	210	52.5%
Day of incidence		
Sunday	40	10%
Monday	36	9%
Tuesday	65	16.3%
Wednesday	62	15.5%
Thursday	26	6.5%
Friday	78	19.5%
Saturday	93	23.3%

Figure 1 shows the month-wise distribution of road traffic accident incidence. The majority of transportation injuries took place on the month of September 58(14.5%) followed by July 48(12%)



Among types of vehicles, two wheelers were present in 212(53%) of incidents followed by bus in 64(16%) of incidents. Head on collision was present in majority of cases 184(46%) followed by side collision

144(36%). Occupants of vehicle were most common victims in transportation injuries 128(32%) followed by pedestrians 88(22%) and two-wheeler drivers 88(22%) each.

Table 2: Types of vehicles, collision and road users

Variables	Number	Percentage
Types of vehicles		
Two wheeler	212	53%
Three-wheeler	33	8.3%
Four-wheeler	56	14%
Pick up van	13	3.3%
Truck	10	2.5%
Bus	64	16%
Tractor	12	3%
Types of collision		

Head on	184	46%
Side	144	36%
Rear end	72	18%
Types of road user		
Pedestrian	88	22%
Two-wheeler driver	88	22%
Pillion rider	64	16%
Driver of four wheelers and heavy vehicles	32	8%
Occupants of vehicles	128	32%

Table 3 depicts the profile of injuries. Most common injuries in this study were found to be abrasion, present in 111(27.8%) cases followed by multiple injuries in 80(20%), contusion in 76(19%), fracture in 74(18.5%),

laceration in 59(14.8%) cases respectively. Among body parts, the majority of injuries were present on head & neck region 120(30%), followed by upper extremities 104(26%).

Table 3: Profile of injuries

Variables	Number	Percentage
Types of injury		Percentage
Abrasion	111	27.8%
Contusion	76	19%
Laceration	59	14.8%
Fracture	74	18.5%
Multiple injuries	80	20%
Part of body sustaining injury		Percentage
Head & neck	120	30%
Abdomen & pelvis	48	12%
Thorax	24	6%
Back	24	6%
Upper extremity	104	26%
Lower extremity	64	16%
Spine	16	4%
Severity of injury		
Mild to moderate	232	58%
Severe	112	28%
Critical	56	14%

DISCUSSION

The present study shows that male is more prone to transportation injuries than the female which is in accordance with various previous studies (5,8,9). It could be so because men being the common bread earner in the family and they have to engage themselves in various outdoor activities. Individuals aged between 20-40 years are more commonly involved in the road traffic accidents as depicted by this study. This fact is also similar to other studies conducted in Nepal and other parts of world (10,11,12). The reason could be that the passengers, drivers and pedestrians are mostly belong to this age group.

Most common type of vehicles involved in road traffic injuries were two-wheeler motorized vehicles. The study conducted by Huang et al in Kathmandu valley showed the similar results. (10). Among the registered vehicles in Nepal, motorcycles

and scooters fall in the biggest proportion. Two wheelers are usually used by youngsters who have just learned to drive. Bikes are one of the unstable vehicles. Their size allowed them to easy lanes changes and overtaking. Above mentioned facts may be the reasons for involvement of two wheelers motorized vehicles in transportation injuries.

In this study, it has been observed that, most of the accidents have taken place in the month of September, July and October respectively. September and October are seasons of various festivals when people move from one place to another to celebrate festivals and meet relatives. Similarly July being the month of monsoon when roads are slippery. The study conducted in year 2004 in eastern Nepal reported rate of higher accidents in the month of January and July. (13). Saturday being the day when most of the accidents happened followed by Friday.

Saturday is the day of holiday when persons have travel around to follow their pending activities of the week.

The study reveals that superficial injuries in the form of abrasion and contusion are being the commonest injuries and head and neck being the most common part of the body to get injured in road traffic accidents. The result is similar to the study conducted by Ossei PPS et al in Ghana (14). A study conducted in Kathmandu reported head and face region or upper and lower extremities being commonly impacted with injuries common to the upper and lower extremities (15).

Injuries are classified according to the severity score. Injury severity score 1-9, was kept in mild to moderate category, injury severity score 16-49, was placed in severe category and injury severity score >50 was kept on critical category. Majority of injuries were mild to moderate 232(58%), followed by severe injuries 112(28%) and critical 56(14%). The study shows the most of the victims sustained mild to moderate injuries, followed by severe injuries. This result is congruent to study conducted in tertiary care hospital located in Dhaka (16).

CONCLUSION

Transportation injuries imparts major role in causing morbidities and mortalities in a country like Nepal, where road conditions are poor and there is little awareness regarding the safety while driving. The study showed pedestrians and two-wheeler drivers mostly sustained injuries involving road traffic accidents. So proper safety measures like wearing helmet and following traffic rules by drivers of two wheelers must be taken in consideration by relevant parties. The pedestrians should walk on sidewalks and cross streets at crosswalks. To prevent fatality, every tertiary hospital should be well equipped with advanced ambulance service and comprehensive trauma team. The government must provide human resources and equipments to every primary health centres for good pre-hospital care.

Declaration by Authors

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