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CORRESPONDING AUTHOR:

Sangya Gyawali

Lecturer, Department of General practice and emergency medicine

Birat Medical College Teaching Hospital, Biratnagar, Nepal

Email: sangya.gyawali@gmail.com

ORCID ID: 0000-0003-1898-0871

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Pattern and severity of injuries, risk factors and outcome of Road Traffic Accident victims attending emergency department of Birat Medical College Teaching Hospital

Sangya Gyawali¹, Rajeev Shah², Nitesh Mandal³

¹ Lecturer, Department of General practice and emergency medicine, Birat Medical College Teaching Hospital

² Associate Professor, Department of ENT and Head Neck Surgery, Birat Medical College Teaching Hospital

³ Medical Officer, Department of General practice and emergency medicine, Birat Medical College Teaching Hospital

ABSTRACT

Introduction: Road Traffic Accidents (RTA) is considered as one of the major public health problems around the globe. It is one of the top 5 causes of morbidity and mortality in South East Asia.

Objectives: To find out pattern and severity of injuries, possible risk factors and outcome of victims of RTA attending emergency ward.

Methodology: This is a cross-sectional study. All the patients with history of RTA attending the emergency ward have been enrolled with written informed consent after obtaining ethical clearance. Those patients with a history of sudden accidental fall or injury by falling objects were not included. The patients are assessed based on a semi standardized study proforma. The final outcome of the patient at the emergency department is noted.

Result: Young adults (17-30 years) were injured most in Road traffic accident (38.41%) Most of them had head injury (59.8%) due to light vehicle (65.2%). Most accidents occurred during evening time (64.3%). Fewer of them were under the influence of alcohol (17%). 39% of the patients were severely injured. 3% patients expired at the emergency ward and 32% of the patients got admitted in ICU. Young adults were severely injured (53.8%) compared to older adults (33.33%).

Conclusion: Young adults were involved most and major accidents were due to light vehicles. The majority of the patients had a milder form of injury requiring hospital admissions. The most common pattern was head injury. fewer of them were under alcohol influence.

INTRODUCTION

A road traffic accident (RTA) is defined as an accident, which takes place on the road between two or more objects because of a moving vehicle and a human being². Road Traffic Accidents (RTA) is considered as one of the major public health problem around the globe and has been established as one of the eighth leading cause.⁴ It is one of the top 5 causes of morbidity and mortality in South East Asia.² Pedestrian, passengers and cyclist were involved in most of the death and disabilities.² Road Traffic accident is a matter of public health concern globally and it accounts for approximately 91% of the world's cases in low and middle income countries Motorcycle accident is found to be the most involved accident among Road Traffic Injuries in most part of the country.³⁻⁵ Commonest injuries encountered is upper and lower extremities injuries followed by head, abdomen, chest and spinal injuries.³⁻⁵ Other common injuries found are skull fracture, subdural hemorrhages, frontal bone fracture, liver laceration and rib fracture. Young age group population were most commonly involved and most of the accidents occurred during morning hours. Injuries and disabilities are increasing day by

day due to road traffic accidents mostly in developing countries. Overs speeding of the vehicle, driving under the influence of alcohol,improper use of safety measures like not using safety belt, helmet are commonly associated risk factors.⁸⁻¹¹Involvement of younger and productive age group in Road traffic injuries has definitely led to heavy burden on socio economic condition and quality of life.⁶Besides this, urbanization, industrialization, violation of the traffic rules, poorly maintained vehicle engines, motorization are also the contributory factors leading to road accidents.⁹⁻¹³

Mortality rate from road traffic accidents varied from 4 per 1 lakh in 2001-2002 to 7 per 1 lakh population in 2011-2012 as depicted by one of the systematic review in Road traffic injuries in Nepal.⁷

METHODOLOGY

This is a prospective, cross sectional study. Written informed consent has been taken for the participation in the study from all the patients. Sample size calculation is done using slovin’s formula and non probability sampling technique has been applied.All the patients with history of Road traffic accident attending the emergency department has been enrolled in the study after obtaining ethical clearance from IRC. Those patients with a history of sudden fall, accidental injury by falling objects and those who didn’t give consent were not included in the study. The patients are assessed based on a semi standardized study proforma. Relevant history, examination findings are noted, needed investigations and management has been done as per emergency protocol. Severity of injury is calculated using Kampala Trauma Score. The final outcome of the patient at the emergency department is noted. SPSS(23)software has been used for data recording and analysis. This research will be implied in day to day practice at the emergency ward so that high risk patients can be prioritized and managed properly from the resuscitation bay.

Operational definition: A road traffic accident (RTA) is defined as an accident, which takes place on the road between two or more objects because of a moving vehicle and a human being ¹⁴.

Injury is defined as; Damage to the body produced by energy exchanges that have relatively sudden discernible effects. ¹⁵

Severity of injury is calculated by using Kampala Trauma Score

Kampala trauma score (4)

a)Age (years)	Score
≤5	1
6-55	2
>55	1
b)Number of serious injuries	
None	3
One	2
Two or more	1
c)Systolic blood pressure	

>89	4
50-89	3
1-49	2
Undetectable	1
d)Respiratory rate (breaths/min)	
10-29	3
≥30	2
≤9	1
e) Neurological status (AVPU system)	
Alert	4
Responds to verbal stimuli	3
Responds to painful stimuli	2
Unresponsive	1
KTS total score: a + b + c + d + e	
Interpretation: score	
mild injury	<11
moderate injury	11-13
severe injury	14-16

RESULTS

In this cross sectional study, all together 112 patients were enrolled. Among them, 27.6% were females and 72.3% were males.

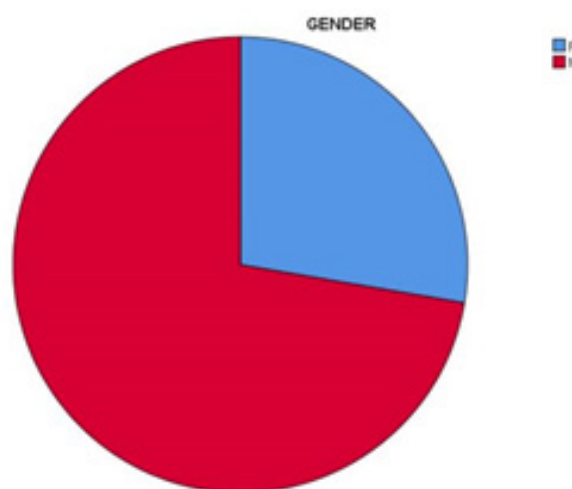


Fig 1: Pie chart showing gender frequency.

Mean Age group was 38.03 years.Of the studied individuals, most of the patients were young adults between 31-45 years of age(38.41%).

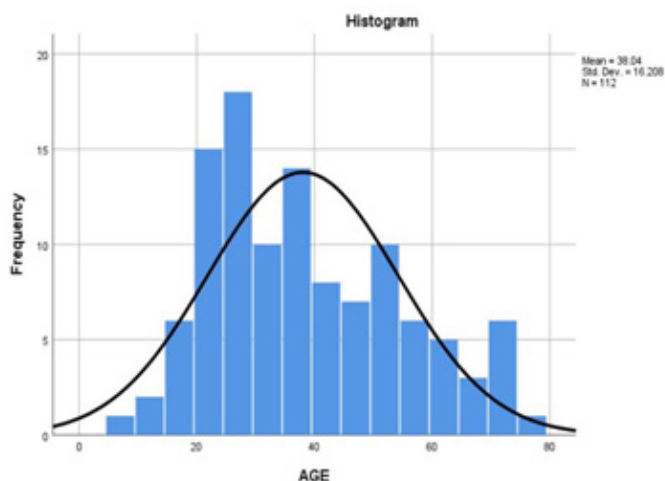


Fig 2: Histogram showing age distribution.

Table showing age groups involved.

Age groups	N	%
Child(0-16yrs)	4	3.6
Young Adults (17-30)	43	38.41
Middle Aged Adults(31-45)	29	25.9
Old Adults(above 45)	36	32.1

Table showing risk factors contributing to accident.

Associated Factors	N	%
Driver	68	60.7
Occupants	44	39.3
Pedestrians	19	17
Under Influence of alcohol	19	17
Morning time	40	35.7
Evening time	72	64.3
Night time	28	25
Heavy vehicle	39	34.8
Light vehicle	73	65.2

The majority of the patients who got accidents were while driving the vehicle (68%). 19% of the patient were pedestrians. Most accidents occurred during evening time(72%) and was due to light vehicle(73%). 19% of the patients were found to be

Table showing severity of injury as per age groups

Age group	Mild injury	Moderate injury	Severe injury
child	4(8.2%)	0	0
Young adults	16(32.7%)	6(25.1%)	21(53.8%)
Middle age adults	18(36.7%)	6(25.1%)	5(12.8%)
Old adults	11(22.4%)	12(50%)	13(33.3%)

Young adults were found to be severely injured (53.8%) compared to older adults(33.33%). 8.2% of the children had mild injury.

under the influence of alcohol.

Table showing frequency of pattern of injuries

Pattern of injury	N	%
Head	67	59.8
Chest	14	12.5
Abdomen	12	10.7
Upper and lower limb	38	33.9
Face , ear, nose and throat	17	15
Spine	6	5.4
Multi system injuries	48	42.9

Head injuries were most commonly encountered (59.8%) followed by chest (12.5%), abdomen (10.7%). 42.9% Of the patients had multi-system injuries.

Severity of injury was calculated using Kampala Trauma score(KTS). 43.8% had mild injury and 34.81% of the patients had severe injury. Among severely injured, more than 50% were young adults(17yrs-30yrs).

Table showing severity of injury

Severity of injury as per Kampala trauma score	N	%
Mild	49	43.8
Moderate	24	21.4
Severe	39	34.81

Among severely injured, more than 50% were young adults (17yrs-30yrs). 3% of severely injured patients expired at emergency ward and 32% got admitted to ICU. 11% of the patients with mild injuries got discharged from emergency.

Table showing frequency of outcome

Outcome	N	%
Discharged	14	12.5%
Expired	3	2.7%
Ward admitted	50	44.6%
ICU admitted	45	40.2%

Table showing severity of injuries as per outcome

Severity of injury	ICU admitted	Expired at emergency	Ward admitted	discharged
Mild	6(13.3%)	0	32(64%)	11 (22.4%)
Moderate	7(15.6%)	0	14(28%)	2 (8.3%)
Severe	32(71.1%)	3(7.7%)	4(8%)	1 (2.6%)

32% of severely injured patients were admitted in ICU. 22.4% of the patients were discharged from emergency and had mild injuries.

Table showing severity of injuries as per pattern of injury.

Severity of injury	Head injury	Chest injury	Abdomen injury	Upper and lower limb fractures	Spine injury	Face, ear nose, throat injury	Multi-system injuries
Mild	31	7	8	14	3	10	26
Moderate	14	3	2	11	1	5	13
Severe	22	4	2	13	2	2	9

DISCUSSION

The majority of victims of Road traffic accidents were males (72.3%) following similar trends in other studies¹⁶⁻¹⁹. Preponderance towards male in our study can be attributed due to majority of male population as per our census. The commonest age groups involved were age below 40 years followed by age groups 41-50 years^{16,20}. Our study also showed that most people involved in the accidents were young adults(17years-30years).Majority of the accidents occurred during morning time. However other literature’s have shown that most accidents occurred during evening time^{18,19}. This difference can be due to the fact that roads are occupied mostly during morning hours by vehicles due to rush for office hours, as roads are empty in early morning there can be over speeding too leading to accidents. Only 17% of the participants were found to be under the influence of Alcohol. In contrast to our study, Dr Raj kumar et al showed that 31.2% of the drivers were under alcohol influence.¹⁸ Less number of people consuming alcohol in our set up can be attributed to strict security checking for alcohol intake in the roads and strict enforcement of rules and regulations regarding the same. Regarding pattern of injuries, our study showed head injuries were most common (59.8%) followed by upper and lower limb injuries and fracture and abdominal injuries. This result was consistent with other studies too^{16,18}. over speeding, lack of helmet use among 2 wheel users and younger generation riding vehicles without proper licence could be the reasons behind this. In the present study driver(60.7%)constituted the largest group of accidents followed by occupants(39.3%) and pedestrians. One of the study done in India also has similar results.¹⁸One who drives are at more risk because of lack of seat belt use and over speeding. In one of the studies done in Ethiopia, prevalence of severely injured patients was 36.5% of the cases which is comparable to our study with prevalence of 34%.²²Regarding the outcome of the patients, 1.2%of the patients expired at emergency ward and 20%of the cases required surgical intervention and were shifted to operation theatre in the study done at Pakistan.²¹ The findings were quite similar to our study that shows 2.7% were expired at emergency ward and 40.2%of the patients were severely

injured requiring ICU admission. This can be explained as most of the emergency set up in urban areas are well developed with adequate human resource and equipments so that trauma patients are prompt resuscitated along with specialist services and needful treatment. This study identified that the prevalence of severely injured among road traffic accident victims is 34.8% and among them 3% expired at Emergency ward and 71.1% got admitted to ICU. This study’s finding was nearly similar to the study conducted in few selected public hospitals in Ethiopia.²²

CONCLUSION

Young adults (17-30 years) were injured most in Road traffic accident (38.41%) Most of them had head injury(59.8%) followed by upper and lower limb fractures, chest and abdominal injuries. Those who got accident were mostly driving the vehicle ((60.7%) and accidents were due to light vehicle(65.2%) .Most accidents occurred during evening time(64.3%). Only fewer of them were under the influence of alcohol(17%). 39% of the total patients were severely injured . Out of them 3% patients expired at the emergency ward and 32%of the patients got admitted in ICU. Young adults were found to be severely injured (53.8%) compared to older adults(33.33%).

LIMITATION OF THE STUDY

Other factors contributing to RTA like condition of the roads, violation of traffic rules, general health condition of victims(seizure disorders), over speeding of the vehicles were not included in the study and history taking due to unavailability of patients relatives and most of the cases were brought by ambulance under police supervision. Patients who were unconscious at presentation, there were difficulties in eliciting history and interrogating other factors contributing to accidents.

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