

Research Article

Pattern of two wheeler road traffic accidents in rural setting: a retrospective study

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ABSTRACT

Background: Roads and vehicles which are for making life comfortable and faster, can result in miserable life when one meet a road traffic accident. By 2020 road traffic accident is projected to become the third leading contributor to the global burden of disease in the world and 6th place as a major cause of mortality worldwide. Motor cyclists are about 25 times more risk than passenger car occupants to die because of road traffic accidents. The objectives of the study were, to study pattern of two wheeler road traffic accidents in rural setting.

Methods: The present research is a retrospective analysis of all the two-wheeler accidents victim admitted in emergency, during the period ranging from September 2015 to February 2016.

Results: Among the total 2,544 patient of RTA admitted within the study period; 1,257 patients (i.e.49.41%) were due to two-wheeler accidents. Next is pedestrian (n=516, 20.2%), light motor vehicle (n=464, 18.23%), and heavy motor vehicle accidents contribute (n=307, 12.06%).

Conclusions: lack of road driving sense and lack of knowledge of traffic rules. Regarding the type of vehicles involved in these accidents, the maximum number of accidents was due to two wheeler vehicles (scooter/motorcycle).

Keywords: Two wheeler RTA, Stray animals, Rural RTA

INTRODUCTION

As per World Health Organization, “accident” means an event, independent of human will, caused by an outside force acting suddenly leading to bodily or mental injury. Roads and vehicles which are for making life comfortable and faster, can result in miserable life when one meet a road traffic accident. By 2020 road traffic accident is projected to become the third leading contributor to the global burden of disease in the world and 6th place as a major cause of mortality worldwide. Motor cyclists are about 25 times more risk than passenger car occupants to die because of road traffic accidents. About more than 25% of the global traffic accidental deaths occur in South East Asia region.¹⁻³

Most of the people were young males who are the future of this developing world. There lost life setback heavy

burden to country, society and family. These accidents are largely preventable, if paid proper attention to the causes leading to it.

Two wheeler riders are more vulnerable to sustain injuries as the external shell of the vehicle is absent to protect them as compared to light motor and heavy motor vehicles. Lost balance during two wheeler accidents further increases the risk of injury. The present study was undertaken to focus on the injury pattern among two wheeler accidents in and around Saifai (rural area in western Uttar Pradesh, India).

METHODS

The present study was carried out in the Department of Emergency, UP Rural Institute of Medical Sciences and Research. This rural tertiary health institute in Saifai,

Etawah district of western Uttar Pradesh, India. The present research is a retrospective analysis of all the two-wheeler accidents victim admitted in emergency, during the period ranging from September 2015 to February 2016.

Inclusion and exclusion criteria

All victims of two-wheeler accidents admitted. Two-wheeler includes motor-cycles, mopeds, and bicycles. Two-wheeler accidents include all types of possible injuries, against all types of vehicles running on the road, collision with any object, surface or any animal or fall from vehicle.

Accidental details obtained the medico-legal records, police inquest, statements from witnesses/relatives and injury record from the examining doctor and the experts dealing with the injury. General examination findings and injuries are documented in the case sheath. Investigations include x-rays, ultrasonography of abdomen, NCCT head, CECT thorax and abdomen to rule out the injuries present in the victim.

Ethical commission permission has been taken for the study. This study has been ethically by UP Rural Institute of Medical Sciences and Research, Saifai, Etawah, UP, India.

Data analysis

Data was analyzed by SPSS 20.0.

RESULTS

Among the total 2,544 patient of RTA admitted within the study period; 1,257 patients (i.e.49.41%) were due to two-wheeler accidents. Next is pedestrian (n=516, 20.2%), light motor vehicle (n=464, 18.23%), and heavy motor vehicle accidents contribute (n=307, 12.06%) as shown in Table 1.

In 1257 two-wheeler victims admitted, 964 (76.69%) were males and 293 (23.3%) were females.

Table 1: Types of vehicle involved in total admitted RTA.

Type of vehicle	Frequency	Percentage
Two wheeler	1257	49.41%
Light motor vehicle	464	18.23%
Heavy motor vehicle	307	12.06%

Most of them were between the age group 20-30 years (n=458, 36.43%) as shown in Table 2. Mean age 35.6 years and median age 27 years. Skilled labourers were the most victims (n=358, 28.5%) followed by students (n=155, 12.3%). About 964 sufferers were male and 293 were females. Male to female ratio obtained as nearly 3:1.

Table 2: Age distribution.

Age group	Frequency	Percentage
< 10 years	38	3.02%
10-20 years	163	12.96%
21-30 years	458	36.43%
31-40 years	251	19.96%
41-50 years	228	18.13%
>50 years	119	9.46%

Drivers were 892 (70.96%) and pillion riders were 364 (28.95%). Helmets were used by 301 victims in whom 292 were drivers and 9 pillion riders (Table 3). Only 32.7% (292 out of 892) drivers were wearing helmet while driving. None of the females were using helmet (Table 4).

Injuries present in victims were presented in table no 8 to Table 11. Majority of patient presented with head injury. Scalp laceration was commonly associated with head injury. Focal brain injury (84.8% cases) found to be more common than diffuse brain injury (14.9%). Table 9 shows the findings obtained about head injury victims in two-wheeler victims.

Many of them were associated with poly-trauma. Maxilla was fractured in 10.19% and mandible was fractured in 12.52%. Incidence of vertebral fracture was about 9.06%.

Table 3: Helmet used among driver and pillion rider admitted.

Helmet used	Frequency (n= 1257)	Percentage	Drivers		Pillion rider	
			Frequency(n=892)	Percentage	Frequency (n=364)	percentage
Yes	301	23.9%	292	32.7%	9	2.47%
No	892	70.9%	536	60.09%	356	97.8%
Status unknown	64	5.1%	64	7.17%	0	0

External thoracic injuries are more common than the internal. Blunt force trauma to the chest can damage the organ without damaging the thoracic wall. Fractures of ribs were observed in 101 cases. Among internal thoracic injuries, lungs were the most commonly involved organ (n=128, 67.6%) followed by the heart (n=7, 3.7%). Mortality in thoracic injury was seen in 17.8% cases.

Motor bikes (n= 932, 74.14%) accidents is more common in two-wheeler RTA (Table 5).

Among 1257 cases sign of alcohol intake was present in 231 victims, 20.8% of drivers and 7.5% of pillion riders (Table 6).

Table 4: Helmet used by males and females.

Helmeted	Males		Females	
	Frequency (n= 964)	Percentage	Frequency (n=293)	Percentage
Yes	301	31.22%	0	0
No	603	62.5%	289	98.63%
Status unknown	60	6.22%	4	1.36%

Table 5: Type of two-wheeler vehicle used by the admitted RTA victims.

Vehicles	Frequency (n=1257)	Percentage
Motor bikes	932	74.14%
Mopeds	168	13.36%
Bicycle	157	12.49%

Table 6: Sign of alcohol intake.

	Frequency	Percentage
Driver (n= 892)	186	20.8%
Pillion driver (n=364)	45	12.36%
Total (n= 1257)	231	18.37%

Majority of accidents were front on collisions (n=537, 42.7%) (Table 7).

Table 7: Nature of accident (n=1257).

Accident	Percentage
Front on collision	42.70%
Rear end hit	10.21%
Skid and fall	8.42%
Hit while overtaking of another vehicle	7.37%
Two wheeler overtaking another vehicle	6.96%
Side on collision	6.91%
Fall from bike	6.23%
Attending mobile call while driving	4.36%
Hitting object/surface	4.22%
Others- female sitting sideways, stucking of pallu of saree or dupatta in rear wheel, animals on road.	2.61%

Blunt trauma abdomen 172 cases reported. Only 1 case of penetrating injury over abdomen seen. Liver was found to be the most common organ involved seen in 27.8% cases followed by spleen (19.2%) and intestine (17.3%) and kidney (13.6%). Mortality in abdominal injury was seen in 15.7% cases.

Table 8: Injury pattern.

Injury	Frequency	Percentage
Head injury	587	46.69%
Chest injury	189	14.71%
Abdomen	173	13.76%
Vertebral	114	9.06%
Pelvis	92	7.3%
Limb (include injury to muscle, tendon and bony fractures)	268	21.32%

Table 9: Head injury (n=587 cases).

Head injury	Percentage
Scalp laceration	77.3%
Scalp fracture	32.1%
Focal brain injury	84.8%
Diffuse axonal injury	14.9%
SAH	44.2%
SDH	20.7%
EDH	31.6%
Intra-parenchymal bleed	53.5%
Intra-ventricular bleed	17.9%
Mortality	24.7%

Table 10: Thoracic injury (n=189 cases).

Thoracic injury	Percentage
Rib fracture	53.3%
Lung injury	67.6%
Pleura	18.2%
Heart and pericardium	3.7%
Airway	3.4%
Esophagus	0%
Mortality	17.8%

Table 11: Abdominal injury (n= 173 cases).

Abdominal injury	Percentage
Blunt trauma	99.7%
Penetrating injury	0.3%
Liver	27.8%
Spleen	19.2%
Kidney	13.6%
Pancreas	1.1%
Intestine	17.3%
Mortality	15.7%

DISCUSSION

Since man created wheel, he is sitting wheels and doing accidents. Injuries to the victims of two wheeler accidents share a significant proportion of severe traffic accident injuries. The mortality rate in road traffic accident in India is one of the highest in the world and reported to be nearly 20 times more than that reported in developed countries. The majority of the vehicles driven by the victims were motor cycles (74.14%). Skilled labourers were the most victims (28.5%) followed by students (12.3%). In African and western countries majority of the victims were students.^{4,5}

The study observed that the age group of 21-30 years was most susceptible to trauma injuries. Male predominance has been observed. In our study, the male to female ratio was reported as 3:1. Similar finding has been reported in the studies done by Husaini et al. And Wong et al, Jha et al, And Kaul et al.⁶⁻⁹ Have reported a lower male-female ratio of 3:1 while a higher male-female ratio of 9:1 was reported by Singh and Dhattarwal.¹⁰ The increase in population and vehicles in general leading to increased congestion on the Indian roads can be directly related to the number of RTA. The common mode of accident involving riders was front on collision (42.7%) followed by rare end hit (10.21%). The commonest mode as per study by Nupur pruthi et al was skid and fall (45.5%).¹¹ Only (23.9%) were wearing helmet in spite of helmet wearing being made a statutory requirement. None of the females were wearing helmet. Also results showed majority of victim suffered from head injury (46.69%), which is obvious in the absence of helmet use.

Females sitting side ways as pillion rider increases the chances for the two-wheeler disbalance and many times resulting in accidents. As per social customs, female wearing Sarees or Dupatta in this region. Cases has been seen where the Pallu of the Saree or the end of the Dupatta get stuck into the rear wheel of the two-wheeler leading to accidents. The above as a cause has been reported in 2.61% which is quite significant. It has been observed the most of the accidents took place at night. Absence of tail lights in bicycle increase their chance of being the victims. Mainly elderly age group ride bicycle at night in this region. During daytime victims who were bicycle rider were mainly females of student section.

In modern day civilian trauma centers, thoracic injury directly accounts for 20-25% of deaths due to trauma; and thoracic injury or its complications are a contributing factor in a further 25% of trauma deaths.¹² But our study showed 17.8% fatality cases associated with thoracic injury in two-wheeler accidents. Blunt force trauma to the chest can damage the organ without damaging the thoracic wall. External thoracic injuries are more common than the internal thoracic injury.¹³ Injury to the lungs and heart may be due to impact of these organs to the solid rib cage and the shearing forces to the hilum of the lungs and the heart by the impact of a moving or due to a direct impact of the fractured ribs to the heart and lungs. The lungs occupy most of the rib cage, and thus are probably more vulnerable to injury when compared to the heart. The findings of our study are in agreement with the earlier studies by other researchers.^{6,14}

Our study significantly reported that blunt trauma abdomen incidence is largely seen in trauma due to two-wheeler accidents. Liver was the most commonly affected organ followed by the spleen. Liver being the largest internal organ and owing to its anterior location is more often the target of blunt force trauma as reported in the earlier studies.^{6,9} Our study also showed similar results. This present study showed mortality is mainly associated with head injury (24.7%) then followed by thoracic injury (17.8%) and abdominal injury (15.7%).

The victims when inquired many were not having driving license and also were unaware about the traffic rules. Other causes, such as driving in effect of alcohol and attending mobile call while driving result in road accidents. Incidence of trauma due to these things is rising in this area. There is no control over the animals present in this area. Road stray animals' occasional collision with two-wheeler also increases accidental incidence as compared to four wheeler in which minor or no trauma occurs to passengers. These injuries are largely preventable and hence remedies should be taken to reduce it incidence of RTA in this area.

CONCLUSION

A total of 1257 victims of two-wheeler road traffic accident in this part of world were studied. The whole data was analyzed for pattern and distribution Of injuries in cases of two wheeler road accidents and cause of death. This may be due to lack of road driving sense and lack of knowledge of traffic rules. Regarding the type of vehicles involved in these accidents, the maximum number of accidents was due to two wheeler vehicles (scooter/motorcycle).

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Ethical approval: The study was approved by the institutional ethics committee

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