



Original Article

Pattern of head injury among two wheelers in road traffic accidents in Uttar Pradesh: Autopsy based retrospective study

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Abstract

Objective: To describe the pattern of head injury among two wheelers in road traffic accidents in Uttar Pradesh.

Methods: A cross sectional study of total of 312 cases of deaths due to fatal road traffic accidents involving riders and pillion riders of two wheelers have been studied. All cases of deaths due to head injuries in fatal road traffic accidents involving riders and pillion riders of two wheelers of both sexes all age groups, treated and untreated, irrespective of duration of survival was included in the study.

Results: The mortality due to two wheeler RTA was highest among the age groups of 21-30 years of age (28.5%) and was lowest in the age >60 years (3.8%). The mortality due to two wheelers RTA was found to be higher among males (63.5%) than females (36.5%). The mortality due to two wheelers RTA was found to be higher among riders (69.9%) than pillion riders (30.1%). The mortality due to two wheelers RTA was found to be higher among whom accident occurred in afternoon (39.4%) than evening (25%), morning (21.8%) and mid-night (13.8%). The mortality due to two wheelers RTA was found to be higher among urban areas (69.2%) than rural (30.8%). The mortality due to two wheelers RTA was found to be higher among Depressed fracture of vertex (31.1%) than Communated Fracture of vertex (25%), Basal Fracture (24.4%), Linear Fracture of vertex (14.1%) and Crush fracture of skull (5.4%). The mortality due to two wheelers RTA was found to be higher among EDH (46.8%) than ICH (21.2%), SDH (17.9%) and SAH (14.1%)

Conclusion: The human error is mainly responsible for fatal RTA. Though it is a most difficult task to control human errors involved, sincere efforts made in this direction can reduce the mortality.

Keywords: Road traffic accidents, Head injury, Mortality.

Introduction

Road Traffic accident is an unplanned event occurring suddenly, unexpectedly and inadvertently in an unforeseen circumstance. Incidences are more common among the two

wheeler vehicles. Head was the most common site to be injured in RTAs. As motorized two wheeler vehicles constitute a large portion of the vehicle fleet in India. The exponentially increasing number of automobile vehicles, poor adherence to

traffic rules and regulations such as maintaining lane discipline, driving in zigzag patterns by public, poorly maintained and congested roads, abuse of alcohol, and lack of awareness about helmets and new generation of high speed vehicles are altogether responsible for accidents^[1]. Head injury has been defined as “a morbid state, resulting from gross or subtle structural changes in the scalp, skull, and or the contents of the skull, produced by mechanical forces”^[2]. Head injury is the major contributing factor in all trauma cases causing mortality and is the commonest cause of mortality and morbidity following two-wheeler crashes^[3].

The World Health Organization (WHO) puts Road Traffic Accident (RTA) as the sixth leading cause of deaths in India that is 4 times more than in some developed countries such as the United Kingdom and Sweden and still increasing rapidly. Fatalities of RTAs in India are estimated to increase up to 150% by 2020^[4]. Some of the factors that increase the risk of road crashes in India are unsafe traffic environment, poor road infrastructure, and encroachments^[5].

Due to lack of protection around the riders and pillion riders, they come into direct contact with hitting objects, thus motorcycle is the least safe form of transportation. Of particular significance are motorcycle accidents that involve passengers without wearing helmets, which result in severe injuries. However, helmet regulation in India is not uniform and poorly enforced^[6]. Few reports have shown the differential analysis of injuries and their severity among riders and passengers, especially the pattern of injuries in pillion riders are not well studied^[7,8].

The present study was conducted to describe the pattern of head injury among two wheelers in road traffic accidents in Uttar Pradesh.

Material and Methods

A cross sectional study of total of 312 cases of deaths due to fatal road traffic accidents involving riders and pillion riders of two wheelers have been studied. All cases of deaths due to head injuries in

fatal road traffic accidents involving riders and pillion riders of two wheelers of both sexes all age groups, treated and untreated, irrespective of duration of survival was included in the study.

Cases other than two wheeler road traffic accidents were not included in this study. Detailed autopsy examination was done. Relevant information was collected from police, relatives and friends of deceased. Rokitansky en-mass evisceration technique was followed in conducting the autopsy. Then with all these findings, post-mortem conclusion as to the cause of death in each case was drawn and analyzed.

The results are presented in frequencies and percentages.

Results

The mortality due to two wheeler RTA was highest among the age groups of 21-30 years of age (28.5%) and was lowest in the age >60 years (3.8%) (Table-1).

The mortality due to two wheelers RTA was found to be higher among males (63.5%) than females (36.5%) (Table-2).

The mortality due to two wheelers RTA was found to be higher among riders (69.9%) than pillion riders (30.1%) (Table-3).

The mortality due to two wheelers RTA was found to be higher among whom accident occurred in afternoon (39.4%) than evening (25%), morning (21.8%) and mid-night (13.8%) (Table-4).

The mortality due to two wheelers RTA was found to be higher among urban areas (69.2%) than rural (30.8%) (Table-5).

The mortality due to two wheelers RTA was found to be higher among Depressed fracture of vertex (31.1%) than Communated Fracture of vertex (25%), Basal Fracture (24.4%), Linear Fracture of vertex (14.1%) and Crush fracture of skull (5.4%) (Table-6).

The mortality due to two wheelers RTA was found to be higher among EDH (46.8%) than ICH (21.2%), SDH (17.9%) and SAH (14.1%) (Table-7).

Table 1: Distribution of mortality according to the age

Age in years	No. (n=312)	%
0-10	24	7.7
11-20	56	17.9
21-30	89	28.5
31-40	81	26.0
41-50	36	11.5
51-60	14	4.5
>60	12	3.8

Table-2: Distribution mortality according to gender

Gender	No. (n=312)	%
Male	198	63.5
Female	114	36.5

Table-3: Distribution mortality due to Fatal RTA involving Riders/Pillion Riders of Two Wheelers

Riders/Pillion Riders	No. (n=312)	%
Riders	218	69.9
Pillion Riders	94	30.1

Table-4: Distribution of mortality according time of Accident

Time of Accident	No. (n=312)	%
Morning	68	21.8
Afternoon	123	39.4
Evening	78	25.0
Mid-night	43	13.8

Table-5: Distribution mortality according to place of accident

Riders/Pillion Riders	No. (n=312)	%
Urban	216	69.2
Rural	96	30.8

Table 6: Types of Skull fractures in RTA Involving Riders & Pillion Riders

Types of Skull Fracture	No. (n=312)	%
Linear Fracture of vertex	44	14.1
Communated Fracture of vertex	78	25.0
Depressed fracture of vertex	97	31.1
Basal Fracture	76	24.4
Crush fracture of skull	17	5.4

Table 7: Distribution of mortality according to Intra Cranial Hemorrhages

Intra Cranial Hemorrhages	No. (n=312)	%
EDH	146	46.8
SDH	56	17.9
SAH	44	14.1
ICH	66	21.2

Discussion

In this study, the mortality due to two wheeler RTA was highest among the age groups of 21-30 years of age (28.5%) and was lowest in the age >60 years (3.8%). In the study by Sanjay^[9], out of 34 cases, the highest number of victims were in the age group of more than 50 years in 12(35%) cases followed by age group between 21 to 30 years in 10(29%) cases and age group between 31 to 40 years in 6(11%) cases. Another study^[11] showed that the two wheeler RTAs are more in the third (115cases) & fourth decades (55 cases) constituting 47.8% and 22.4% of total 245 victims. It was followed by 20 to 39 years constitutes 70.2% of total victims. The present study found that the mortality due to two wheelers RTA was found to be higher among males (63.5%) than females (36.5%). Sanjay^[9] showed that most of the victims were males with 20(59%) cases, the number of female fatalities were also quite high accounting for 14(41%) cases. The findings of this study contradict a study which states that females who sat sideways had fewer injuries and lesser mortality as compared to male passengers who sat astride^[10]. However, similar to the findings of this study, Kumar et al^[11] were males belonging to 88.2% and females 11.8% and in the study of Singh et al^[12] males belong to 86.96% and females belong to 13%.

In this study, mortality was higher among riders (69.9%) than pillion riders (30.1%). Ravikumar^[11] reported motorcycle riders were 187(76.3%) and pillion riders comprised 58(23.7%) of 245 cases. This study found that most of the cases were those who got accident in afternoon. Sirathanont and Kasantikul^[13] demonstrated most of motorcycle crashes were between 06.00 PM – 09.00 PM. Ding et al^[14] reported most of the head

injuries occurred between 04.00 PM – 11.00 PM peaking at 9.00 PM. In the present study, the mortality due to two wheelers RTA was found to be higher among urban areas (69.2%) than rural (30.8%). Findings observed in Singh et al^[12] found 16.98% of victims from rural areas.

In the present study, the mortality due to two wheeler RTA was found to be higher among Depressed fracture of vertex (31.1%) than Communated Fracture of vertex (25%), Basal Fracture (24.4%), Linear Fracture of vertex (14.1%) and Crush fracture of skull (5.4%). The mortality due to two wheelers RTA was found to be higher among EDH (46.8%) than ICH (21.2%), SDH (17.9%) and SAH (14.1%). Ravikumar^[11] found that skull fractures are not a dictum to be present in all fatal head injury cases. In this study skull fractures were present in 166 (67.8%) cases. The dominant type of skull fractures found was the linear (fissured) fracture in 55.43% cases followed by basilar fracture in 17.5%, Crushes fracture in 18.1%, Communated fracture in 5.4% and depressed fracture in 3.6%. Fissured fracture was the most commonly observed fracture (57%) in study of Menon and Nagesh^[15](2005) and Shivakumar et al^[16].

Ravikumar^[11] reported that the commonest variety of Intra Cranial Hemorrhage found was subdural haemorrhage 90.8%, followed by sub arachnoid haemorrhage 70.5%, Intra cerebral hemorrhage 20.6% and least is extra dural hemorrhage found in 4.8% of cases. The most common cause of death which was Intra Cranial Haemorrhage from head injury was reported in the study by Nzegwu et al^[17].

Conclusion

The human error is mainly responsible for fatal RTA. Though it is a most difficult task to control human errors involved, sincere efforts made in this direction can reduce the mortality and morbidity. Preventive measures of all epidemic diseases are based on the cause. Similarly, for reducing fatalities among victims of two wheeler road traffic accidents, it is essential to study the

cause of RTAs, which revolve around factors responsible as Human errors, Machine (Vehicle) errors, and environment.

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