



STUDY OF PATTERN OF INJURIES IN ROAD TRAFFIC ACCIDENTS INVOLVING TWO WHEELERS

Forensic Medicine

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ABSTRACT

Traffic accidents especially in urban setting has emerged as leading cause of death in young people, who are in the prime of their lives leading to not only loss of precious lives but also loss of many economical productive years. Maximum fatalities which occur by traffic accidents are caused by two - wheelers. The present study was done on cases received for medico legal autopsy at the mortuary of Department of Forensic medicine, Sanjay Gandhi Memorial Hospital, New Delhi. It was observed that males (76%) outnumbered females (24%) as victims of two wheeler accidents. Majority of victims (32%) were in the age group of 21-30 years. Only 26% of victims were wearing helmets and 70% were wearing no protective gear and 4% were wearing turban. The commonest cause of death was head injuries, which are preventable by use of helmet and other protective gears.

KEYWORDS

Two wheelers, Accident, Head injury, Helmet.

Introduction:

Road traffic accidents are a major cause of death and disability in developing nations. The accidents lead to personal as well as national loss especially in young as it leads to loss of many productive years which the victims of these horrible tragedies could have provided to the nation. Accidents have become the single most serious health problem especially in a fast moving urban city like Delhi. Out of all the vehicles present on the road, two-wheelers cause maximum fatalities in traffic accidents as a rider on two-wheeler is fully exposed to nature and has very little protection, if any. Yet two-wheelers are the most popular means of transport in young and middle class. The motorized two wheeler population in Delhi has increased very rapidly in the past two decades which in itself is due to the growing population and increasing affordability of middle class and also due to increase in the production of these vehicles in India. This growing numbers of vehicles on the road as fast outpaced the development of roads infrastructure in the cities thus leading to even more congestion and accidents. According to Solanki et al all accidents represent a major epidemic of non-communicable disease in the present century. Road traffic accident cause economic loss to nation, society and victim. In remote past, incidence of head injuries were more due to falls, hunting and military operations rather than vehicular accidents. However in the last century, vehicular accidents have surpassed all other causes of head injuries. In study done by Chandra J2, head injuries were responsible for 71.9% of vehicular accidents deaths. The present study has been aimed to analyse various factors related to road traffic accidents in Delhi. This may help in formulating preventive measures to reduce their incidence.

Materials and Method:

The study was done on cases received for medico legal autopsy at the mortuary of Department of Forensic Medicine, Sanjay Gandhi Memorial Hospital, New Delhi. In the study we have analysed the pattern of injuries sustained in fatal two-wheeler motor vehicular accidents and their relationship with various factors like age, sex, time, traffic situations, type of vehicle, use of protective gear like helmets and quality of helmets used so as to understand the role of protective gears in prevention of fatalities. Information regarding the particulars of the victim, the date, time and place of accident, type of offending vehicle were collected by examining the inquest papers, hospital records, and also interviewing the relatives of victim.

Observations:

It was observed that age group of 21-30 yrs was the most vulnerable group. (Table no. 1). Majority of victims (76%) were males. Males were predominantly affected as males mostly drive motorcycles, which were involved in majority of crashes (Table no. 2). Motorcycles involved in accidents were 68% of total cases followed by scooter in 28% of cases and cyclist in 4% of cases (Table no. 3). Out of 160 cases studied, 74% were drivers, 22% were pillion riders and 4% were cyclists (Table no. 4). Majority of victims 70% were not wearing any

helmet, 4% were wearing turban, followed by 26% victims wearing helmet (Table no. 5). Maximum number of cases coincided with peak hours of traffic from 12 noon to 6PM (Table no. 6). It was found that fatality rate was maximum (76%) in the group not wearing any helmet, followed by in those wearing non ISI helmets (22%). The fatality rate was lowest (4%) in the group wearing ISI marked helmets. It was observed that the most common cause of death in groups not wearing helmet and those wearing non ISI helmets was head and brain injuries, resulting from trauma to head. In the group which was wearing ISI marked helmet, most common cause of death were injuries other than head injuries (Table no.7). It was observed that pattern of cranial injuries, did not differ much in those not wearing helmet and those wearing non ISI marked helmets. But cranial injuries were significantly lower in group wearing ISI marked helmets (Table no.8).

Table no. 1: Age wise distribution:

S. No.	Age Group(years)	Number of deceased	Percentage (%)
1	0-10	6	4
2	11-20	16	10
3	21-30	52	32
4	31-40	34	21
5	41-50	28	17
6	51-60	14	9
7	> 60	10	7

Table no. 2: Sex wise distribution:

Sex	Number of deceased	Percentage (%)
Males	122	76
Female	38	24
Total	160	100

Table no. 3: Vehicles involved:

S. No.	Type of vehicle	Number of victims	Percentage (%)
1	Motorcycle	110	68%
2	Scooter	44	28%
3	Bicycle	6	4%

Table no. 4: Type of victims:

Type of victims	Number of victims	Percentage
Drivers	118	74%
Pillion Riders	36	22%
Cyclist	6	4%

Table no. 5: Incidence of helmeted and non-helmeted victims

S. No.	Type of victims	Number of victims	Percentage
1	Victims with non ISI helmets	36	22%
2	Victims with ISI helmets	6	4%

3	Victims without helmets	112	70%
4	Victims with turban	6	4%

Table no. 6: Diurnal Variation

Time	Number of deceased	Percentage (%)
12 midnight- 6AM	4	2
6AM- 12 Noon	42	27
12 Noon- 6 PM	90	56
6PM- 12 midnight	24	15
Total	160	100

Table no.7: Cause of death

S. No.	Cause of death	Victims without helmets (118)	Percentage	Victims with non ISI helmets (36)	Percentage	Victims with ISI helmets (6)	Percentage
1	Head injury alone	96	81%	22	61%	1	17%
2	Head injury and other injuries	20	17%	14	39%	1	17%
3	Other injuries	2	2%	0	0	4	67%

Table no. 8: Pattern of Cranial Injuries

S. No.	Injuries	Victims without helmets (118)	Percentage	Victims with non ISI helmets (36)	Percentage	Victims with ISI helmets (6)	Percentage
1	Scalp injuries	57	96%	34	94%	4	67%
2	Skull fractures	50	85%	30	83%	1	17%
3	Brain injuries	53	90%	26	72%	2	33%
4	Intracranial hemorrhage	54	91%	31	86%	0	0%
5	Brain stem hemorrhage	47	80%	26	72%	0	0%

Discussion:

In the age group analysis of the victims, maximum incidence was in the age group 21- 30 years followed by 31–40 years. Similar findings were reported in studies by Pathak SM. et al⁴, Mehta⁵ and Jha⁶, Jain A et al⁷. In our study males (76%) outnumbered females (24%) as victims of two wheeler accidents which is consistent with the study done by Tandle and Keoliya³, Jain A et al⁷ and Singh SK⁸. In our study, Motorcycles were involved in 68% of cases followed by scooter in 28% of cases and cyclist in 4% of cases. Number of scooters involved in accidents, are steadily increasing due to availability of new gearless models which are very easy to operate. Similar findings were reported by Tandle and Keoliya³ and Singh et al⁹. Driver was the victim in majority of cases (74%) as also reported by Jain A et al⁷. Most of time two-wheeler is driven by driver alone and even when there is a pillion rider driver is most commonly fatally injured in accidents because they face the front impact. Majority of accidents were recorded between 12 noon to 6 PM, comprising (56%) of cases, followed by between 6 AM to 12 noon (27%). These findings were similar with the findings of Tandle and Keoliya³, Pathak SM et al⁴ and Singh et al⁹. Commonest cause of death in our study was head injury followed by combination of head and other injuries. This is consistent with findings of Chandra J², Hitosugi et al¹². In group not wearing helmets, head injury as cause of death was seen in (81%) of cases. Head injury was the cause of death in 61% of cases in group wearing non ISI marked helmets whereas 17% of cases constituted those who are wearing ISI marked helmet. Thus not only wearing helmets is important but the quality of helmet is also important. If helmet is not strong enough to absorb the force of impact at the time of accident, it will lead to injuries to head and brain. The findings are consistent with findings of Lin et al¹⁰, Hundley et al¹¹ and Hitosugi et al¹².

Conclusion:

Two-wheelers are less safe as they rest on two points thus there is less stability and more chances of skidding. The two-wheelers have no

shields around the riders as the four-wheelers have. So, the riders are much more exposed to the environment and can be easily hit by the large vehicles as they are less conspicuous on the roads. Head is the most vulnerable part of the motorcycle riders. Most of fatalities occur due to trauma to head and injuries to the brain. As evident from our study, use of ISI marked helmet and other protective gear reduces the fatalities significantly. Thus there is a need to educate people regarding usage of good quality (Indian Standards Institute approved) helmets while driving two wheelers.

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