

Profile Study of Motorcyclists Victims in Road Traffic Accidents at Jaipur Region- An Observational Antemortem Study

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Abstract

World Health Organization defined accidents as ‘an unexpected, unplanned occurrence which may involve injury’¹. Only 28 countries, covering 7% of the world’s population, have comprehensive road safety laws on all five key risk factors: drinking and driving, speeding, and failing to use helmets, seat-belts, and child restraints as per the global status report on Road Safety 2013 by World Health Organization¹. India is undergoing major economic and demographic transition coupled with increasing urbanization and motorization. Injuries on roads, at homes, and in the workplace have increased due to lack of safety-related policies and programs. The health sector bears the maximum brunt in terms of provision of acute care, and short-term and long term rehabilitation service. This study describes profile of motorcyclists’ victims in road traffic accidents observation done and they were compared with the previous studies. This study was conducted to analyze the sociodemographic profile of motorcycle crashes among total cases of RTA. During study period, a total number of 22618 patients were admitted to trauma centre, from which 10564 were road traffic accident cases, from which 25 % were two wheeler crashes.

Keywords: Road Traffic Accidents, Motorcyclist, Drinking & Drive.

Introduction

Motor vehicle crashes are the leading cause of death in adolescents and young adults², and of the estimated 856000 road deaths occurring annually worldwide³, 74% are in developing countries. Road Traffic Accident is the most common cause of death in developing countries. In India rapid urbanisation,

industrialisation, population explosion and migration of people in past two decades has resulted in enormous growth in the field of road transportation. This has resulted in increasing amount of the road traffic leading to increased risk for occurrence of road traffic accidents.

Factors predisposing to Road Traffic Injuries are classified into Agent, Human and Environmental. Analysis of this Epidemiological Triad is crucial to develop and implement mechanisms for control and prevention of fatal injuries. The major causes of accidents are drunk driving, driving over the speed limit, not using helmets and seat belts, rash and negligent driving including overconfidence,

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carelessness and thoughtlessness, failure to maintain lanes, brake failures, mishaps due to bad road conditions and curvy roads, etc. Generally, the behaviour of the younger age group involved in rash driving and enhanced acceleration capacities of the vehicles are the other contributing factors. Traffic and non traffic collisions may result between vehicles, between vehicle and pedestrian, between vehicle and animal, or between a vehicle and a living/ non living architectural obstacle. Currently two wheelers are major component of road traffic, most people prefer motorised two wheelers for various reasons with travellers opting for a powered two wheelers as a cost efficient alternative to expensive and less frequent public transport systems, their fuel efficiency, convenience in form of operation and maintenance for short distance travel with one or two persons especially at the peak hours as a means of reducing or avoiding the effects of congestion etc. Lack of systematic data generation mechanisms both at the national and state level leads to limitation in designing appropriate intervention strategies to deal with the problem in the country.

Considering the preciousness of human lives, along with financial loss that occurs during treatment, loss of earning, and many times leading to functional disability, this study had been undertaken to observe the sociodemographic profile of road accidents Involving motorcycles. An attempt was also made to probe into medicolegal aspects of these accidents so as to suggest remedial measures to traffic rules and law enforcing agencies to decrease the toll of these accidents and to minimising the morbidity and mortality statistics related to motorcycle accidents.

Aims and Objectives

1. To determine the proportion of motorcycle crashes among total cases of RTA.
2. To observe demographic profiles of these cases.

Material and Methods

It was a Hospital Based Descriptive Observational study and was done from 1st August, 2019 to 31st July, 2020 at SMS Hospital, Jaipur. Patients with history of Road accidents while riding motorcycles from Jaipur region are included.

Inclusion criteria:

1. Patients admitted to trauma centre with history of RTA while riding motorcycles during

2. Consent given by the patient/attendant.

study period

The present study was conducted at Department of Forensic Medicine, SMS Hospital and Medical College, Jaipur during 1st August, 2019 to 31st July, 2020 on cases of motorcycle accidents admitted to Trauma Centre of SMS Hospital, Jaipur.

Observation and Results

A total of 22618 Medico-legal Cases were admitted at the trauma Centre out of which 46.7% cases amongst them were cases of Road traffic accidents (RTA). Further, out of them, 816 cases of RTA (25%) injured in motorised two wheeler accidents including occupants of motorcycles, mopeds, scooters, Activa and pedestrians. 243 cases (29.8%) cases injured in motorised two wheeler accidents were fatal amongst these but majority of them were either brought dead or fatal within 24 hours. The occupants of two wheelers other than motorcycles and pedestrians, cases with ambiguous history and those who did not consent for the participation in the study were excluded and 100 cases were included in the study on first come and first serve basis. Majority of victims of motorcycle accidents in the present study were between 20-40 years of age (69%) which shows that the active population of the society was suffering most consequent to the menace of casualties on the roads while riding motorcycles (Table no -1). Least number of victims was senior citizens followed by the persons between 40-60 years of age.(Table-2) The

observations are quite obvious as the active proportion of society is the most vulnerable to such events of mishaps on the roads owing to many reasons. Mean age of victims of motorcycle accidents in the present study was 29.848±236 years. This is an obvious observation, males being the majorly productive members of the Indian society are more involved with commuting from one place to another especially using two wheelers, motorcycles being the most commonly used two wheeled vehicle in the country. Although more common in rural settings, it is also commonly used in urban and sub-urban settings in recent times; almost wiping off mopeds and scooters from the Indian roads. 89% victims of motorcycle accidents were males and rest 11% were females. 69.7% males and 63.6% females were from 20-40 years age group the active and productive population of the society participating in tasks requiring commuting from one place to another and thus more vulnerable to arias accidents (Table-3). The next age group to suffer trauma due to motorcycle accidents in males was 0-20 years in comparison to 40-60 year old females which is well explained on basis of the gender wise activity statue of population of Indian society where young and adolescent boys start participating in family tasks and also start riding motorbikes whereas females of this age group are neither allowed to participate in outdoor family tasks nor encouraged to move out of

houses, whereas the female population of 40-60 years is still engaged in societal and cultural chores actively thus more prone to road accidents.

78% victims of motorcycle accidents included in the present study were drivers or riders or fresh riders and rest 22% were pillion riders. Majority of victims in the study were first riders as in majority of the cases were riding alone. There were seven cases (8.9%) in which the pillion riders suffered minor injuries not requiring admission for the same.

A higher proportion of riders (76.9%) were victimised with motorcycle accidents in 21-40 years age group in comparison to 40.9% pillion riders of the same age group (Table-4). Whereas there were 31.9% pillion riders and 7.7% riders; and, 22.7% pillion riders and 11.2% riders respectively in 41-60 years and less than 20 years age groups. This reflects that the pillion riders of more than 40 years age were most affected. The age group was significantly related to the occupant status of the accident victims. All the motorcycle riders i.e. first riders were males. No female victim was injured while driving the motorcycle in the present study which is an obvious observation as females are rarely seen driving motorbikes in Jaipur and the trend has recently changed with the practice recently being picked up by very few young girls. Occupant status was significantly related to the gender(Table-5).

Table 1: Proportion of motorcycle crashes among Road Traffic Accidents admitted at Trauma Center of SMS Hospital, Jaipur during study period

	No.	Percentage
Total no. of cases admitted to Trauma Center SMSH	22618	100%
No. of cases of Road Traffic accidents among them	10564	46.7%
No. of cases of Road Traffic accidents of Jaipur region	3264	30.9%
No. of cases of motorised two wheeler crashes of Jaipur region	816	25%
No. of fatalities among motorised two wheeler accidents	243	29.8%

Table 2: Age-wise distribution of cases of motorcycle accidents

n=100

Age group (in yrs.)	Number of cases	Percentage
0-20	16	16%
21-40	69	69%
41-60	13	13%
>60	02	2%
Total (%)	100	100%

Table 3: Age and Gender -wise distribution of cases of motorcycle accidents

n=100

Age group (in yrs.)	Male (%)	Female (%)	Total (%)
0-20	16 (17.9%)	0	16 (16%)
21-40	62 (69.7%)	07 (63.6%)	69 (69%)
41-60	10 (11.2%)	03 (27.3%)	13 (13%)
>60	01(1.2%)	01 (9.1%)	02 (2%)
Total (%)	89 (100%)	11 (100%)	100 (100%)

$X^2 (5, N=100) = 5.1151$, p value=0.163557; $p > 0.5$ Not Significant

Table 4: Age-wise and occupant status wise distribution of cases of motorcycle accidents

n=100

Age group (in yrs.)	Rider (%)	Pillion Rider (%)	Total (%)
0-20	11 (11.2%)	05 (22.7%)	16 (16%)
21-40	60 (76.9%)	09 (40.9%)	69 (69%)
41-60	06 (7.7%)	07 (31.9%)	13 (13%)
>60	01 (1.2%)	01 (4.5%)	02 (2%)
Total (%)	78 (100%)	22 (100%)	100 (100%)

$X^2 (5, N=100) = 12.6203$, p value=0.005534; $p < 0.05$ Significant

Table 5: Occupant status and sex-wise distribution of cases of motorcycle accidents**n=100**

Gender	Rider (%)	Pillion rider (%)	Total (%)
Male	78 (100%)	11 (50%)	89 (89%)
Female	0	11 (50%)	11 (11%)
Total (%)	78 (100%)	22 (100%)	100 (100%)

$\chi^2 (3, N=100) = 38.5684, p \text{ value} < 0.001$ Most Significant

Discussion

22618 Medicolegal Cases were admitted at the trauma Centre of SMS Hospital during the study period from 1st August, 2019 to 31st July, 2020. 46.7% cases (10,564) from amongst them were cases of Road traffic accidents (RTA). Further, out of them, 816 cases of RTA (25%) injured in motorised two wheeler accidents including occupants of motorcycles, mopeds, scooters, activa and pedestrians. 243 cases (29.8%) cases of motorised two wheeler accidents were fatal amongst these but majority of them were either brought dead or fatal within 24 hours. The above data reflects that approximately about half of the traumatic casualties requiring admissions to hospitals and emergency care result from road traffic accidents. Although, motorised vehicles have changed the face of the society making transportation easy and thus, saving much time for other productive tasks and making life comfortable, turning the world into a smaller place with enhanced accessibility even to much remote and interior places; yet, this facility becomes menace when mishandled and results in mishaps. With the advancement of technology in the automobile industry, the world has been blessed with high speed automatic vehicles in attractive designs and speed has become the symbol of today's society. Motorcycles have seen an upsurge in past few years as replaced almost all other two wheelers. Young adults use them not only as a means of transportation but also as a sports equipment to gain fun from speeding, racing and stunts with an associated risk of

traffic accidents. There are many factors that increase the risk of accidents like over-speeding, violation of traffic rules, bad roads, untrained drivers, faulty licensing, poorly maintained vehicles etc. Overall, road accidents are one of most common causes of untimely fatalities and also a preventable cause of mortality. Morbidity and mortality resulting from vehicular accidents, especially motorcycle accidents is increasing day by day and must be monitored regularly to observe the pattern of injuries resulting from the changing trends of vehicles and traffic sense. An alarming rise in fatalities of motorcyclists compelled us to plan this study with this purpose to elaborate upon the pattern of injuries suffered in these cases to recommend ways for preventing accidents as well as to suggest measures to prevent the proportion of mortalities. The present study revealed that 25% cases of road accidents in Jaipur region resulted from motorcycle crashes and 29.8% of them resulted in fatality. This is a significant proportion in the era of COVID-19 pandemic full of lockdowns and restrictions on travel.

The present study reported that the maximum number of victims of motorcycle accidents were in their third and fourth decades of life, the active population of the society. 16% victims were less than twenty years of age and 15% were of more than forty years. The results show that the most affected age group was 20-40 years which is well known to be the most vulnerable age group for unnatural incidents resulting in trauma. 89% of the admissions due to

motorcycle accidents were of males. Jain A, et al (2009)⁴ also observed same results 81 % male were the victims and maximum deaths occurred in age groups of 18-44 years, 77%, Sharma BR, et al (2007)⁵ also found same results. Ogunlusi JD and Nathaniel C (2011)⁶ said that males (M) were 127 while females (F) were 9, with M:F ratio of 14.1:1.0. It is due to that obvious as men are more actively engaged in outdoor works in comparison to women who are more involved with household chores as per sociocultural norms of Indian society. Thus, the most commonly affected population of the study comprises of the most productive sections of the society thus resulting in exponential consequences of victimisation by not just causing physical harm to the victims but also resulting in socioeconomic setback to their families.

In the present study, 78% of the accident victims were riders and rest 22% were pillion riders. Comparison of occupant status to the affected age group, it was observed that, 76.9% riders were of 21-40 years age in comparison to 40.9% pillion riders; whereas, 36.4% pillion riders were more than forty years of age in comparison to 8.9% riders. Children, adolescents and young adult pillion riders contributed twice as much than the riders in the same age groups. **Chichom-Mefire A, et al (2015)**⁷ results said that 405 motorcycle crashes were out of total 621 injury victims This distribution is an obvious one considering the age wise activities of both groups, young males mostly riding the vehicle to assist the older people in the family for their outdoor activities and societal roles. **Sukumar S (2018)**⁸ studied a total of 34 cases of pillion rider fatalities they said almost all were involved the injuries. In our study 78 % were riders it may be due to that Sukumar S⁸ conducted the study only on pillion riders. people from extremes of ages and less active age groups are generally dependent on younger family members and friends for their daily chores as regards to transportation which is also true for females, very few drivers proportionate to men of same age group, especially for motorcycles which also reflects in the present study where no female rider

was observed. All the riders in the present study were males whereas equal numbers of pillion riders were affected from both genders although they contributed towards 100% female population and 12.3% male population of the study.

Suggestion

1. Adoption of the appropriate road safety policy is the main driving force essentially needed for the major reduction in road traffic fatalities.
2. Education of traffic rules and road safety should be implemented in school curriculum to inculcate road safety practices since childhood.
3. RTA must be considered like other notifiable diseases.
4. Fine on those persons not wearing helmet and not following rules.

Ethical Clearance- Taken from The Ethics Committee, S.M.S. Medical college and attached hospital, Jaipur.

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Conflict of Interest- Nil.

References

1. World Health Organization, Regional Office for South-East Asia, New Delhi. Injury prevention and control in South-East Asia Region 2002.
2. Taket A (1986A) accident mortality in children, adolescents and young adults. *World Health Statistics Quarterly* 39, 232-256.
3. Feachem RGA, Kjellstrom T, Murray CJL, Over M & Phillips MA (1992) *The Health of Adults in the Developing World*, London: Oxford University Press.
4. Jain A, Menezes RG, Kanchan T, Gagan S, Jain R. Two wheeler accidents on Indian roads- a study from Mangalore, India. *J Forensic Leg Med.* 2009 Apr; 16(3):130-3.
5. Sharma BR, Gupta N, Sharma AK, Sharma S.

Pattern of fatal motorized two-wheeler crash injuries in Northern India: Is safety Helmet adequate prevention. *Trends in Medical Research*. 2007,2(1):27-36.

6. Ogunlusi JD, Nathaniel C. Motorcycle Trauma in a St Lucian Hospital. *West Indian Med J* 2011;60(5):557.
7. Chichom-Mefire A, Atashili J, Tsiagadigui JG, Fon-Awah C, Ngowe-Nigerian M. A prospective pilot cohort analysis of crash characteristics and pattern of injuries in riders and pillion passengers involved in motorcycle crashes in an urban area in Cameroon: lessons for prevention. *BMC Public Health*. 2015;15:915. <https://doi.org/10.1186/s12889-015-2290-4>
8. Sukumar S. A Retrospective Autopsy Based Study On the Pattern of Head Injuries in Pillion Riders Involved in Fatal Road Traffic Accidents. *Int J Med Toxicol Forensic Med*. 2018 Apr;8(2):71-8.