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Study of pattern of injuries sustained by two-wheeler drivers in a tertiary care hospital of Bhopal city

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ABSTRACT

Background: Road Traffic Accident (RTA) is one of the major causes of death and disability in India, especially among two-wheeler drivers due to over speeding, carelessness, stunts on road, ignorance of safety measures and alcohol. It accounts for considerable loss of the nation in terms of life and property.
Objectives: To study the pattern of injuries among two-wheeler drivers in relation to different parameters in a Tertiary Care Hospital of Bhopal City.
Material and Methods: The present study was carried out at a tertiary care hospital of Bhopal city. All the 2-wheeler drivers who were victims of Road traffic accidents & who reported to the emergency department of the study place during study period (from 1st January to 31st December 2017) were included in the study. Various parameters like age, gender of the victims, time of accident, seasonal variations, factor responsible for accident, types of injury sustained by the victims in relation to the use of helmet while driving and consumption of alcohol, duration of stay in the hospital and outcome of different injuries were considered.
Results: There was a clear-cut male preponderance (85.21%) with maximum involvement of younger age groups (21- 30 Years). Most of the accidents have been taken place in evening hours (6 pm to 12 midnight). The type of injury sustained in majority of cases was multiple injuries followed by head injury, among them most of the victims (79.68%) were not wearing the helmet. The most common factor responsible for the accidents (34.25%) was Rash Driving.
Conclusion: Due to increasing population, increasing number of vehicles and over-burdened traffic, the incidence of RTA is rising especially in two-wheeler drivers and passengers. There is loss of productive and young lives of Country. It is very common to consume alcohol, not using protective measures, reckless driving, crossing the red signal especially in younger generation due to increasing work load of education and employment.

1. Introduction

According to a study conducted by the National Transportation Planning and Research Centre (NTPRC) every four minutes a person is killed or injured in road accidents in India[1]. The spectrum of injuries depends on site, direction & force of impact, design of vehicle, ejection of victim and supervening factors like overturning or fire.[1]

Road Traffic accidents (RTAs) have emerged as a major global public health problem of this century and are now recognised as "veritable neglected pandemic".[2] Motor vehicle crashes are a common cause of death, disability and demand for emergency medical care.[2]

Globally, about 1 million people die each year from traffic crashes and about 20-50 million are injured or permanently disabled.[3] In 2000, road traffic injuries were ranked as the ninth leading cause of death and the eighth leading cause of disability-adjusted life-years (DALYs) lost globally by the Global Burden of Disease Study.[4] Accidents, tragically, are not often due to ignorance, but are due to carelessness, thoughtlessness and over confidence.[5]

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With increasing population, increasing vehicular density and meager infrastructure amenities, the 21st century is plagued by yet another important issue, Road Traffic Accidents (RTA) which has in fact become a slow modern pandemic and prescribing to a pattern of a secular trend of disease epidemiology.[6] A majority of victims of road traffic injuries are men in the age group of 15-44 years and belong to the poorer sections of society.[7] Also, a vast majority of those killed and injured are pedestrians, motorcyclists and pillions riders, and bicyclists.[7]

The magnitude of Road traffic accidents and fatalities in India is alarming. In 2009, 4.22 lakh road traffic accidents and 1.27 lakh road traffic fatalities were reported. These numbers translate into one road accident every minute and one road accident death every four minutes. However, this is an underestimate, as not all injuries are reported to the police.[8]

The main aim of the study is to study the pattern of injuries among two-wheeler drivers involved in road traffic accidents, in relation to different parameters in a Tertiary Care Hospital of Bhopal City.

2. Materials and Methods

It is a prospective observational study carried out at a tertiary care hospital in Bhopal, during the one year period from 1st January 2017 to 31st December 2017.

Study population were two-wheeler drivers who came to emergency department of the hospital for treatment after sustaining injuries due to RTA.

2.1. Inclusion criteria

All victims of different age groups from 11 to 60 years of road traffic accidents who were driving two-wheeler brought to the study place directly after accident.

2.2. Exclusion criteria

Victims of less than 11 years and more than 60 years**,** pillion riders of two-wheeler, pedestrians or drivers/passengers of Four/Three wheelers, patients shifted from other hospitals.

3. Results

The total numbers of victim were 832 during the study period, among them 709 (85.21%) were male and 123 (14.78%) were female. Most of the victims were of younger age group (21- 30 years). The time of accident was evening (6 pm to 12 midnight) in the majority (43.62%) of cases. Most of the accidents (33.65%) have been taken place in rainy season (July to Sept.). In most of the cases (34.25%) the cause of accident was “Rash Driving”. The injury sustained in majority of cases was multiple injuries (37.86%) followed by head injury (29.32%). In majority of cases the victims who sustained different injuries were not wearing the helmet (79.68%). The duration of stay in hospital was 1 to 2 weeks in majority (44.95%) of cases. Partial recovery has been observed in 28.12% of cases while 67.06% of victims were completely recovered of their injuries. Deaths were observed in 4.80% of victims.

4. Discussion

RTA is a major preventable cause of mortality and morbidity in India. The 2-wheeler drivers are 2nd most common group affected, preceded only by pedestrians. They are more prone owing to inherent instability of the vehicle, poor roads, rash & negligent driving, non-usage of helmets & with recent frequent fuel hikes people prefer to use a 2-wheeler as much as possible.

In the present study the maximum victims were found to be male (85.21% of total 832 cases) as in case of studies by Saumil P. Merchant et al[1] (86.3%), Dandona R and Mishra A[2] (>80%), Nilambar Jha et al[5](83%) Dr. E. Ravi Kiran et al[6] (85.71%), Abhishek Singh et al[8] (88.71%), Dileep Kumar R. et al[9] (87%), Rakesh Kakkar et al[10] (80.5%), and Harnam Singh & A.D. Aggaewal[11] (83.1%).

The age group most commonly affected in present study was 21 to 30 years (43.75%), possibly due to greater exposure of males of younger age group to outdoor activities and also due to ignorance of traffic rules and safety measures, similar results were found in studies by Nilambar Jha et al[5] (31.3%), Dr. E. Ravi Kiran et al[6] (25.5%) and Dileep Kumar R. et al.[9] The commonest age group affected was 13-16 years (30.5%) in the study by Harnam Singh and A.D. Aggarwal.[11]

The time of accident was in evening hours (from 6 pm to 12 midnight) in maximum number (43.62%) of cases, due to high traffic load on roads in evening hours similar to studies by Dr. E. Ravi Kiran et al[6](33.5%) and Abhishek Singh et al.[8]

Maximum number of accidents (33.65%) were found in rainy season (July to September) probably due to slippery roads, as also found in study by E. Ravi Kiran et al[6] but according to study by Saumil P. Merchanr[1] and Harnam Singh & A.D. Aggarwal[11] maximum cases of RTA were found in summer (40.3%) and winter (54.2%) respectively.

Among various factors responsible for road traffic accidents, in present study most common cause (34.25%) of RTA was rash driving as in case of study by Rakesh Kakkar et al,[10] alcohol was the cause of accident in only 11.05% of cases in present study; almost similar results (13%) was found in the study by E. Ravi Kiran et al.[6] Alcohol impairs judgment, increases reaction time and diminishes visual acuity, hence increasing chances of an accident.

Multiple injuries were sustained in maximum (37.86%) number of cases. The duration of stay in hospital was 1 to 2 weeks in maximum number (44.95%) of cases. Although survival rate has been improved in the recent times due to availability of emergency treatment but still the mortality is

Table 1: Age and gender wise distribution

Age	Male (85.21%)	Female (14.78%)	Total
11- 20 years	222 (31.31%)	51 (41.46%)	273 (32.81%)
21- 30 years	302 (42.59%)	62 (50.40%)	364 (43.75%)
31- 40 years	113 (15.93%)	07 (5.69%)	120 (14.42%)
41- 50 years	38 (05.35%)	03 (2.43%)	41 (04.92%)
51- 60 years	34 (04.79%)	00 (00.00%)	34 (04.08%)
Total	709	123	832

Table 2: Time of Accident

Time	11-20 years		21-30 years		31-40 years		41-50 years		51-60 years		Total		Grand Total
	M	F	M	F	M	F	M	F	M	F	M	F	
06 am-12 pm	38	18	85	19	33	02	08	00	11	00	175 (24.68%)	39 (31.70%)	214 (25.72%)
12- 06 pm	67	11	57	12	24	01	09	01	07	00	164 (23.13%)	25 (20.32%)	189 (22.71%)
06 pm-12 am	98	22	133	29	44	04	18	02	13	00	306 (43.15%)	57 (46.34%)	363 (43.62%)
12 am-06 am	19	00	27	02	12	00	3	00	03	00	64 (9.02%)	02 (1.62%)	66 (7.93%)
Total	222	51	302	62	113	07	38	03	34	00	709	123	832

Table 3: Seasonal Variations

Month	11- 20 years		21- 30 years		31- 40 years		41- 50 years		51- 60 years		Total		Grand Total
	M	F	M	F	M	F	M	F	M	F	M	F	
Jan.-March	38	13	71	17	26	02	06	01	09	00	150 (21.15%)	33 (26.82%)	183 (21.99%)
Apr.-June	47	04	65	11	22	01	12	00	07	00	153 (21.57%)	16 (13.00%)	169 (20.31%)
July-Sept.	83	19	94	19	37	03	11	02	12	00	237 (33.42%	43 (34.95%)	280 (33.65%)
Oct.-Dec.	54	15	72	15	28	01	09	00	06	00	169 (23.83%)	31 (25.20%)	200 (24.03%)
Total	222	51	302	62	113	07	38	03	34	00	709	123	832

Table 4: Causes of Accident

Cause	11- 20 yrs.		21- 30 yrs.		31- 40 yrs.		41- 50 yrs.		51- 60 yrs.		Total		Grand Total
	M	F	M	F	M	F	M	F	M	F	M	F	
Rash Driving	103	09	114	20	31	00	08	00	00	00	256 (36.10%)	29 (23.57%)	285 (34.25%)
Wrong Signal Crossing	78	04	88	05	45	02	11	00	03	00	225 (31.73%)	11 (8.94%)	236 (28.36%)
Alcohol	07	00	51	01	23	00	06	00	04	00	91 (12.83%)	01 (0.81%)	92 (11.05%)
Other	34	38	49	36	14	05	13	03	27	00	137 (19.32%)	82 (66.66%)	219 (26.32%)
Total	222	51	302	62	113	07	38	03	34	00	709	123	832

Table 5: Type of Injuries Sustained by Victims

Injuries	With Helmet	Without Helmet	Total
Head Injuries	16 (6.55%)	228 (93.44%)	244 (29.32%)
Limb Injuries	27 (15.42%)	148 (84.57%)	175 (21.03%)
Chest Injuries	13 (24.07%)	41 (75.92%)	54 (6.49%)
Abdominal Injuries	03 (9.67%)	28 (90.32%)	31 (3.72%)
Spinal Injuries	05 (38.46%)	08 (61.53%)	13 (1.56%)
Multiple Injuries	105 (33.33%)	210 (66.66%)	315 (37.86%)
Total	169 (20.31%)	663 (79.68%)	832 (100%)

Table 6: Duration of Stay in Hospital-

Injury ↓ / Stay →	<24 Hours	1 day to 1 week	1 to 2 weeks	2 weeks to 1 month	>1 Month	Total
Head Injury	05 (2.04%)	49 (20.08%)	81 (33.19%)	96 (39.34%)	13 (5.32%)	244 (29.32%)
Limb Injury	12 (6.85%)	78 (44.57%)	45 (25.71%)	32 (18.28%)	08 (4.57%)	175 (21.03%)
Chest Injury	03 (5.55%)	16 (29.62%)	22 (40.74%)	11 (20.37%)	02 (3.70%)	54 (6.49%)
Abdominal Injury	00 (00%)	04 (12.90%)	09 (29.03%)	17 (54.83%)	01 (3.22%)	31 (3.72%)
Spinal Injury	00 (00%)	00 (00%)	02 (15.38%)	08 (61.53%)	03 (23.07%)	13 (1.56%)
Multiple Injuries	07 (2.22%)	71 (22.53%)	215 (68.25%)	19 (6.03%)	03 (0.95%)	315 (37.86%)
Total	27 (3.24%)	218 (26.20%)	374 (44.95%)	183 (21.99%)	30 (3.61%)	832

Table 7: Outcome of Different Injuries

Injury ↓ / Outcome →	Death	Partial Recovery	Complete Recovery	Total
Head Injury	14 (5.73%)	51 (20.90%)	179 (73.36%)	244 (29.32%)
Limb Injury	01 (0.57%)	131 (74.85%)	43 (24.57%)	175 (21.03%)
Chest Injury	03 (5.55%)	09 (16.66%)	42 (77.77%)	54 (6.49%)
Abdominal Injury	01 (3.22%)	03 (9.67%)	27 (87.09%)	31 (3.72%)
Spinal Injury	00 (00%)	05 (38.46%)	08 (61.53%)	13 (1.56%)
Multiple Injuries	21 (6.66%)	35 (11.11%)	259 (82.22%)	315 (37.86%)
Total	40 (4.80%)	234 (28.12%)	558 (67.06%)	832

very high. Along with it, there is a high rate of morbidity, leading to very poor quality of life in the survivors due to the devastating consequences.

Complete recovery was observed in maximum number (67.06%) of cases. 4.80% of cases proved to be fatal. Partial recovery has been observed in 28.12% of cases. Even in these cases there is loss of productive capacity of a family along with decrease in quality of life.

5. Conclusion

The incidence of RTA is rising, especially involving two-wheelers leading to loss of productive and young lives of Country. It is very common to consume alcohol, lack of protective measures, reckless driving etc. especially in younger generation. Keeping all these factors in mind some steps should be taken to formulate policies with a view of reducing mortality & morbidity due to RTA.

6. Source of Funding

None.

7. Conflict of Interest

None.

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