Original Article

Indian Journal of Forensic Medicine and Pathology
Volume 10 Number 4, October - December 2017
DOI: http://dx.doi.org/10.21088/ijfmp.0974.3383.10417.5

Socio-Demographic Profile of Head Injury Victims Died in Two Wheeler Accidents: An Autopsy Based Study

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Abstract

Introduction: The development of science in various aspects of human life has evolved far more superior, sophisticated and lethal weapon of assault. The motorized transportation media like vehicles, trains, aero planes etc. with fast moving vehicular traffic, vast urbanization and changing social patterns have contributed to increase in the incidence of trauma to human body. In spite of all the advantages that motorcycles have, motorcyclists form a large proportion of those injured or killed on the roads. Socio-demographic factors play important role in deciding standard of living and safety measures available for any population group. Present study was carried out to find relation between various socio-demographic factors in head injury victims died in two wheeler accidents which will be helpful for implementation of preventive measures. *Material and Methods:* The present autopsy based study was conducted over a period of two years from 1st Oct 2012 to 30th Sept 2014 in the Department of Forensic Medicine and Toxicology, Government Medical College Latur, Maharashtra, India. All autopsy cases of head injury involved in two wheeler accidents were included in the study. Detailed history was taken and post-mortem examination was carried out. Head injury victims died in two wheeler accidents during study period selected and studied for its relation with various socio-demographic factors. *Results:* Out of total 1706 autopsies conducted by the department during study period, 95 (05.57%) cases were of death due to head injury in two wheeler accidents. Out of total 95 cases, maximum deaths i.e. 55 (47.37%) occurred between 21-40 years of age group and 78 (82.1%) were males. Married victims were 73 (76.84%). Maximum victims i.e. 89 (93.68%) were literate and most of the victims i.e. 67 (70.53%) died due to accidents occurred in urban area. Victims from lower socio-economic group were commonly involved. Not a single rider/pillion had worn helmet at the time of incidence. *Conclusion:* Legal code alone is unlikely to be effective in changing motorcyclist's behaviour. There is an urgent need of public education and awareness about safety measures to be followed while driving. Guiding and implementing traffic related rules through counselling, health education, road shows, use of electronic and print media etc will have a great effect in controlling these accidents. Strict obedience of traffic rules can save the life of most of the victims.

Keywords: Socio-Demographic Profile; Two Wheeler; Accidents; Head Injury.

Introduction

Accidents are world's most serious health problem. The development of science in various aspects of human life has evolved far more superior, sophisticated and lethal weapon of assault. The motorized transportation media like vehicles, trains, aero planes, etc with fast moving vehicular traffic, vast urbanization and changing social patterns have contributed to increase in the incidence of trauma to human body [1].

According to World Health Organization road traffic injuries are increasing, notably in low and middle-income countries, where rates are twice those in high-income countries [2]. With a rising income and greater need for mobility, the personalized mode of transport was growing in importance in the past few years. Motorcycles have increasingly become a popular means of transport in low and middle-income countries [3]. This is partly because

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Received on 14.08.2017, **Accepted on** 14.09.2017

motorcycles are relatively cheaper than other motor vehicles in terms of initial purchase and maintenance costs [4]. In spite of all the advantages that motorcycles have, motorcyclists form a large proportion of those injured or killed on the roads [3]. In India and few other developing countries the penetration level of two wheelers (two wheelers/1000 persons) is much higher compared to developed countries [5].

Present study was carried out to find relation between various socio-demographic factors in head injury victims died in two wheeler accidents which will be helpful for implementation of preventive measures.

Material and Methods

This prospective autopsy based study was conducted over a period of two years from 1st Oct 2012 to 30th Sept 2014 in the Department of Forensic Medicine and Toxicology, Government Medical College Latur, Maharashtra, India.

All autopsy cases of head injury involved in two wheeler accidents were included in the study. Detailed history was taken from police, relatives and eye witnesses and post-mortem examination was carried out. Head injury victims died in two wheeler accidents during study period selected and studied for its relation with various socio-demographic factors.

Results

During the study period total 1706 medico-legal autopsies were conducted by the department of which 448 (26.26%) cases were of RTA (Road Traffic Accidents). Out of 1706 autopsies, 95 (5.57%) cases turned out to be of head injury victims died in two wheeler accidents.

Table 1: Age, Sex and Marital status (n=95)

Demographic Data	No. of Cases (%)
Age Groups (yrs)	
0-10	00 (0%)
11-20	05(5.26%)
21-30	27(28.42%)
31-40	28(29.47%)
41-50	16(16.84%)
51-60	09(9.47%)
61-70	07(7.37%)
>70	03(3.16%)
Sex	
Male	78(82.1%)
Female	17(17.9%)
Marital Status	
Married	73 (76.84%)
Unmarried	22 (23.16%)

Table 2: Literacy Level (n=95)

Literacy Level	No. of Cases	Percentage (%)
Illiterate	06	06.32%
Primary School	13	13.68%
Middle School	10	10.53%
High School	18	18.95%
Diploma / Intermediate	09	09.47%
Graduate / Postgraduate	36	37.90%
Professionals	03	03.16%

Table 3: Place of accident. (n=95)

Place of Accident	No. of Cases	Percentage (%)
Rural	28	29.47%
Urban	67	70.53%

Table 4: Socio-economic Group (n=95)

Socioeconomic Group	No. of Cases	Percentage (%)
Upper	08	08.42
Middle	29	30.53
Lower	34	35.79
Dependent	24	25.26

In the present study (Table 1), it was observed that out of total 95 cases, maximum deaths i.e. 55 (47.37%) occurred between 21-40 years of age group and 78 (82.1%) were males. Married victims were 73 (76.84%).

In the present study, it was found that out of total 95 cases maximum victims i.e. 89 (93.68%) were literate (Table 2) and 67 (70.53%) victims died due to accidents occurred in urban area (Table 3).

In the present study, it was observed that out of total 95 cases, victims from lower socio-economic group were commonly involved (Table 4).

In the present study, it was also observed that most of the deaths occurred during day time 56 (58.97%). Incidence of two wheeler accidental deaths was nearly same in all the three seasons i.e. 33 (34.74%) in summer & 31 (32.63%) in both rainy & winter season.

Out of total deaths i.e. 95, maximum deaths i.e. 70 (73.68%) occurred due to involvement of geared vehicles & 25 (26.32%) deaths occurred due to involvement of non-geared vehicles. Not a single rider/pillion had worn helmet at the time of incidence.

Discussion

Road Traffic Injuries (RTIs) are the sixth leading cause of death in India with a greater share of deaths, disabilities and socioeconomic losses in young populations. The growth of the motor vehicle industry, liberalized economic policies of successive governments, aggressive media promotion, increasing purchasing power of Indian people, easy availability of loans and poor public transport systems have contributed to increasing motorization and a changing transportation scenario in India. The total number of registered vehicles increased by 14 times from 5.3 million in 1981 to 72.8 million by 2004. The number of public transport buses has increased slightly from 331 000 in 1991 to 768 000 by 2004, while during the same period, motorized two wheelers (MTWs– scooters, motorcycles and mopeds) increased 4 times from 14 million to 52 million. Overall, 71% of all vehicles are MTWs, 12% are cars, jeeps and taxis, 1% buses and the remaining are other vehicles. MTWs account for a large proportion of vehicles on the roads [6]. Motorcycles have much higher risks of being involved in crashes involving fatalities than other vehicles. Socio-demographic factors play important role in deciding standard of living and safety measures available for any population group. However despite the gravity of the situation, there are very few studies dedicated to motorized two wheeler accidents.

During study period total 1706 medico-legal autopsies were conducted of which 448 (26.26%) cases were of RTAs. Out of 1706 autopsies, 95 (5.57%) cases turned out to be of head injury victims died in two wheeler accidents. Sharma BR et al (7.04%) [7], Behera C et al (4.01%) [8], Jha S et al (4.75%) [9], Surendar J and Shiva RD (5.64%) [10] and Reddy A et al (4.42%) [11] observed similar burden of deaths due to head injury in RTAs involving two wheelers.

In the present study (Table 1), maximum deaths were observed between age group 31-40 years (29.47%) followed by 21-30 years (28.42%). This shows that maximum deaths i.e. 55 (47.37%) were between 21-40 years. This finding is consistent with Sharma BR et al (53.79%) [7], Behera C et al (72.34%) [8], Jha S et al (38.33%) [9], Surendar J and Shiva RD (61.36%) [10] and Reddy A et al (45.18%) [11] Contrary to present study findings Sirathanout J and Kasantikul V [12] observed maximum deaths below 21 years of age group. Out of total 95 cases, maximum were males i.e. 78 (82.10%). Similar finding was observed in the most of other studies.

The young adult males are the prime bread earners of the family who remains outdoors during most of the day and have a tendency to take undue work so they are more commonly exposed to outdoor activities travelling between the home and place of work whereas old age peoples and women usually remain indoors and children are confined to the residential premises.

In the present study (Table 2), it was observed that most of the victims were literate i.e. 89 (93.68%) while 6 (6.32%) were illiterate. Graduates and postgraduates were maximum i.e. 36(37.90%). This study finding is in consistence with Jha S et al (74%)

[9] and Radha PK et al (82.5%) [13] where most of the victims were literate. This may be due to unawareness about traffic rules & inadequate use of safety measures even by the literate people and may be due to non stringent action by the government for violation of traffic rules.

In the present study (Table 3), it was observed that 67 (70.53%) victims died due to accidents occurred in urban area and 28 (29.47%) occurred in rural area. Present study finding is in consistent with Radha PK et al (80%) [13], Ravikumar R (74.29%) [14] and Kumar S and Singh RKP (72%) [15]. Industrialization, urbanization and changing life style of people has created heavy traffic burden in urban area which results in disproportion in traffic density and safety measures provided which results in more accidents & deaths.

In the present study (Table 4), it was observed that out of total 95 cases, victims from lower socio-economic group i.e. 34 (35.79%) were commonly involved followed by middle socio-economic group i.e. 29 (30.53%). This may be due to economic problems faced by the lower socio-economic group people compromising safety measures & treatment.

It was also observed that most of the deaths i.e. 56 (58.97%) occurred during day time. Similar finding is observed by Behera C et al (55.32%) [8], Reddy A et al (70%) [11], Sirathanout J and Kasantikul V [12], Ding SL et al [16] and Kakeri SR et al (68.1%) [17] . This may be probably due to heavy and congested traffic during day time while reaching to destination.

Incidence of two wheeler accidental deaths was nearly same in all the three seasons i.e. 33 (34.74%) in summer & 31 (32.63%) in both rainy & winter season in the present study. This is consistent with Reddy A et al [11] and Kumar S and Singh RKP [15]. Whereas Jha S et al [9]and Honnungar RS et al [18] observed more fatal accidents during summer season and rainy season respectively in their study. There is no direct relation found between season & two wheeler accidents. It is mostly dependant on road condition, safety measures & driving skills rather than seasonal variations.

Out of total deaths i.e. 95, maximum deaths i.e. 70 (73.68%) occurred due to involvement of geared vehicles & 25 (26.32%) deaths occurred due to involvement of non-geared vehicles. Reddy A et al (80%) [11] and Fitzharris M et al (56.1%) [19] also found maximum deaths due to involvement of geared vehicles in their study. This may be due to better control and easy handling of non-geared vehicles as compared to geared one. Also the geared vehicles are more in weight and can attain high speed compared to non-geared vehicles. Mass and velocity increases kinetic energy which in turn causes more damage at the time of accident.

In the present study, not a single rider/pillion had worn helmet at the time of incidence. In other similar studies maximum riders/pillions had not worn the helmet at the time of accident. Simply use of helmet as a safety measure could have been saved most of the lives.

Conclusions

Middle aged males of low socioeconomic group being most accident prone who was perhaps the bread earner of his family. Majority of the cases occurred during daylight which indicates faulty traffic management system where traffic rules are always over looked and poor sense of safe driving methods among victims (e.g. use of helmet). These accidents are responsible for loss of life, disability and undefined impact on socioeconomic resources (due to loss of productive population). It can be preventable. Legal code alone is unlikely to be effective in changing motorcyclist's behaviour. There is an urgent need of public education and awareness about safety measures to be followed while driving. Guiding and implementing traffic related rules through counselling, health education, road shows, use of electronic and print media etc., will have a great effect in controlling these accidents.

Conflict of Interest: None to declare

Source of Funding: Nil

References

1. Two Wheelers, Evolution, History [Internet]. 2014 [cited 2014 Nov 4]. Available from URL: http://autob.indiamart.com/two-wheelers/history-2w.html.
2. World Health Organization. Global status report on road safety 2013: Supporting a decade of action. 2013; .p.1,7,18. Available from URL: http://www.who.int/violence_injury_prevention/road_ safety_status/2013/report/cover_and_ front.pdf.
3. World Health Organization. Helmets: A road safety manual for decision- makers and practitioners. WHO, Geneva, Switzerland.2006. Available from URL:http://www.who.int/violence_injury_prevention/publications/road_traffic/hel met_manual.pdf.
4. Solagberu BA, Ofoegbu CKP, Nasir AA, Ogundipe OK, Adekanye AO, Abdur-Rahman L. Motorcycle

injuries in A developing country and the vulnerability of riders, passengers and pedestrians. Injury Prevention 2006;12:266-8.

5. Government of India. Road transport year book (2011-12). Ministry of shipping, road transport & highways. Transport research wing. New Delhi 2013 Nov; P. i, ii. Available from URL: http://morth.nic.in /showfile.asp?lid=1131.
6. Pruthi N, Chandramouli BA, Sampath S, Devi BI. Patterns of head injury among drivers and pillion riders of motorized two-wheeled vehicles in Bangalore. Indian Journal of Neurotrauma 2010:7(2); 123-8.
7. Sharma BR, Harish D, Singh G, Vij K. Patterns of fatal head injury in road traffic accidents. Bahrain Med Bull 2003;25(1):22-5.
8. Behera C, Rautji R, Lalwani S, Dogra TD. A comprehensive study of motorcycle fatalities in South Delhi. J Indian Acad Forensic Med 2009;31(1):6-10.
9. Jha S, Yadav BN, Karn A, Aggrawal A, Gautam AP. Epidemiological study of fatal head injury in road traffic accident cases: a study from BPKIHS, Dharan. Health Renaissance 2010 May-Aug;8(2):97-101.
10. Surendar J, Siva Ranjan D. A Comprehensive study of fatal head injuries among motorcyclists: a one year prospective study. IOSR Journal of Dental and Medical Sciences (IOSR-JDMS) 2013;10(4):88-101.
11. Reddy A., Kagne R.N., Balaraman R., Sivaraman V., Diwakar S. Profiling of two-wheeler related fatal accident cases autopsied at the union territory of India–Puducherry. International Journal of Recent Trends in Science and Technology 2014;11(2):200-4.
12. Sirathanout J, Kasantikul V. Mortality and injury from motorcycle collision in Phetchaburi Province. J. of Med Assoc of Thailand 2003;86:97-102.
13. Radha PK, Sreegiri S, K JVS. Pattern of mortality and morbidity amongst motorized two wheeled vehicle (MTV) riders and pillions in King George hospital, Visakhapatnam. Int J Res Health Sci [Internet] 2014 Apr 30; 2(2): 501-6. Available from URL: http://www.ijrhs.com/issues.php?val=Volume2 &iss=Issue2.
14. Ravikumar R. Patterns of head injuries in road traffic accidents involving two wheelers: an autopsy study. J Indian Acad Forensic Med 2013;35(4):349-52.
15. Kumar S, Singh RKP. Pattern of craniocerebral injuries in fatal vehicular accidents in Patna (Bihar). J Indian Acad Forensic Med 2014;36(2):125-9.
16. Ding SL, Pai L, Wang JD, Chen KT. Head injuries in traffic accidents with emphasis on the comparisons between motorcycle-helmet users and non-users, J Formos Med Assoc 1994 Mar;93(1):42-8.
17. Kakeri SR, Bagali MA, Goudar ES, Qadri SY. Pattern of injuries and death sustained by the occupants of the two-wheeler during road traffic accidents. Al Ameen J Med Sci 2014;7(2):118-24.
18. Honnungar RS, Aramani SC, Vijay Kumar AG, Ajay Kumar TS, Jirli PS. An epidemiological survey of fatal road traffic accidents and their relationship with head injuries. J Indian Acad Forensic Med 2011; 33(2):41-3.
19. Fitzharris M, Dandona R, Kumar GA, Dandona L. Crash characteristics and patterns of injury among hospitalized motorized two-wheeled vehicle users in urban India. BMC Public Health 2009;9:11. Available from URL: http://www.biomed central.com/1471-2458/9/11.