

Importance of Wearing Helmet in Preventing Death due to Motor Cycle(Bike) Accidents

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ABSTRACT

Road traffic injuries are a major public health problem and a leading cause of death and injury around the world. Each year nearly 1.2 million people die as a result of road crashes, and millions more are injured or disabled. According to the National Highway Traffic Safety Administration (NHTSA), motorcycle riders are 26 times more likely to die in a traffic collision than passenger vehicle occupants, and 5 times more likely to be injured. In a study conducted by NHTSA on 104,472 motorcyclists injured in traffic crashes, 15 percent of helmeted and 21 percent of unhelmeted riders suffered TBI. A helmet aims to reduce the risk of serious head and brain injuries by reducing the impact of a force or collision to the head. A helmet works by, reducing the deceleration of the skull, spreads the forces of the impact over a greater surface area and by preventing direct contact between the skull and the impacting object. Present study was carried out in Mahadevappa Rampure Medical College, Kalaburagi with the aim to know cause of death in deaths due to bike accidents autopsied at Mahadevappa Rampure Medical College, Kalaburagi between 2011 to 2016(6-year retrospective study). Results of the study shows that out of 100 cases, in 65 cases cause of death was head injury and in 35 cases it was hemorrhagic shock, septicemia, multi organ failure and others. In 48% of cases injuries were seen in thoracic region and in 40% of cases abdominal injuries. Whereas in 34 cases except intracranial hemorrhage no other injuries were seen on the body. The present study shows that maximum deaths can be prevented by wearing a proper protective helmet.

Keywords: Head injury, Bike accident and Helmet.

INTRODUCTION

Road traffic injuries are a major public health problem and a leading cause of death and injury around the world. Each year nearly 1.2 million people die as a result of road crashes, and millions more are injured or disabled¹. In low-income and middle-income countries, car

ownership and use rates are generally much lower than in high-income countries. However, the ownership and use of motorcycles and other two-wheelers is generally relatively high - for example, in India 69% of the total number of motor vehicles are motorized two-wheelers, considerably higher than in high-

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income countries². "India tops the world in road crash deaths and injuries. It has 1 per cent of the world's vehicles but accounts for 11 per cent of all road crash deaths, witnessing 53 road crashes every hour; killing 1 person every 4 minutes," the report said. In the last decade, 13 lakh people died and another 50 lakh got injured on Indian roads, according to The 2019 World Bank report, titled 'Guide for Road Safety Opportunities and Challenges³. Motorcycles are less stable than cars and less visible to other drivers. In a crash, motorcyclists lack the protection of an enclosed vehicle. According to the National Highway Traffic Safety Administration (NHTSA), motorcycle riders are 26 times more likely to die in a traffic collision than passenger vehicle occupants, and 5 times more likely to be injured. In a study conducted by NHTSA on 104,472 motorcyclists injured in traffic crashes, 15 percent of helmeted and 21 percent of unhelmeted riders suffered TBI, Traumatic brain injury accounted for 54 percent of the riders within this group who did not survive⁴. In regard to helmet use, numerous observational studies demonstrate that motorcycle helmets reduce the risk of death and head injury up to 42% and 69%, respectively^{5,6}. According to study conducted by Alok Kumar Mathur and others, among 1,17,553 two wheelers observed, almost two-fifth drivers (39.4%) wore helmet correctly, whereas, less than three-fifth (58.7%) did not. Almost equal percentage of male (58.6%) and female (58.9%) did not wear helmet at all. As compared to drivers, two-wheeler passengers were observed lower in using helmet correctly (11.6%). Even though correct helmet use during the crash reduces the severity of head and neck injury, observed helmet use in Rajasthan was low⁷. In a study conducted by Jayadevan Sreedharan and et. al., regarding wearing of helmets 36 (11.7%) respondents

claimed ignorance about the need for a safety helmet. Ninety-seven (31.4%) riders however claimed they used a safety helmet while riding a motorcycle, but only 48 (49.5%) identified themselves as regular safety helmet wearers⁸. The present study was taken with the objectives to analyze the injuries caused in bike accidents and cause of death.

MATERIALS AND METHODS:

Present study was carried out in Mahadevappa Rampure Medical College, Kalaburagi. Cases autopsied between January 2011 to December 2016 with history of bike accidents were included in the study. (6-year retrospective study). Total 100 cases were autopsied with the history of bike accidents. In each case details of injuries were studied and cause of death was noted from the PM report. History of each case was noted from inquest report. In each case age, sex, types of injuries and cause of death is noted. Injuries were classified as Intracranial hemorrhages, injuries over head and neck region, thoracic region, abdominal region and over limbs. In cause of death it is noted whether person died due to head injury or other than head injury. Then percentage of data collected is calculated.

RESULTS

Table no 1 shows out of 100 cases studied 82 were males and remaining 18 were females. Maximum deaths due bike accidents were seen in the age group between 21 years to 40 years, 45 deaths occurred and next in age group 41 -60 years 44 deaths occurred. In age group between 11-20 years 7 deaths occurred and least seen in the age 1-10 years and above 60 years i.e. 2 cases each.

Table no. 2 shows injuries seen over different part of the body, in 68 cases

Table 1: Sex and Age wise distribution of RTA (Bike Accidents)

Sex		Age in years				
Male	Female	1-10	11-20	21-40	41-60	60+
82	18	2	7	45	44	2
82%	18%	2%	7%	45%	44%	2%

Table 2: Regional wise injuries seen in RTA (Bike Accidents)

ICH	Head & Neck	Thoracic	Abdomen	Upper Limb	Lower Limb
68	36	48	40	21	35
68%	36%	48%	40%	21%	35%

Table 3: Cause of Death in RTA (Bike Accidents)

Head Injury	Others
65	35
65%	35%

intracranial hemorrhage is seen, in 48 cases injuries were seen over thoracic region, in 40 cases injuries were seen over abdomen region, in 36 cases injuries were seen over head and neck region, in 35 cases over lower limb and in 21 cases injuries were seen over lower limb. In 34 cases except head injuries no other injuries were seen over the body.

Table no. 3 shows cause of death, in 65 cases death was head injuries and remaining 35 cases cause of death were other than head injury like hemorrhagic shock, septicemia, multi organ failure and others.

DISCUSSION

Motorcycles crashes are considerable causes of injury related fatality and disability⁹. Common cause of death in bike accident is head injury. Many previous studies show significant relationship between head injuries and death^{10,11}. In the present study maximum deaths occurred between age group 21-60 years 89% of deaths occurred, males were 82% and females were 18%. In 65 cases cause of death was head injury, whereas in remaining 35 cases it was others like injuries to thoracic region, abdominal regions and others. When we study mechanism of head injury, it is because when a motorcycle or bicycle is involved in a collision, the rider is often thrown from the cycle. If the rider's head hits an object, such as the ground, the head's forward motion is stopped, but the brain, having its own mass, continues to move forward until it strikes the inside of the skull. It then rebounds, striking the opposite side of the skull. This type of injury can result in anything from a minor

head injury, such as concussion, to a fatal head injury. A helmet aims to reduce the risk of serious head and brain injuries by reducing the impact of a force or collision to the head. A helmet works in three ways, one by reducing the deceleration of the skull, by spreading the forces of the impact over a greater surface area and by preventing direct contact between the skull and the impacting object¹². In the present study, in 65 cases cause of death is head injury, if proper protective helmet was worn these deaths can be prevented. Whereas in 35 cases except head injuries no other injuries were seen on body in these cases if proper helmet was worn both morbidity and mortality can be prevented. In a study of fatally injured riders, Sarkar et al. (1995) noted that 36% of deaths among helmeted riders were due to the trunk, as compared to 19% among the non-helmeted. Similar findings were noted in a California study of fatalities before and after a mandatory helmet law (Kraus et al., 1994). Thus, among helmeted motorcyclists, a substantial proportion of fatalities that occur will involve serious chest and abdominal trauma¹³.

CONCLUSION

From the present study we can conclude that maximum deaths can be prevented by wearing proper protective helmet, because in the present study in 65% of cause of death is head injury. Whereas in 35% cases except head injury no other injuries were seen on the body. Though wearing helmet is compulsory by law, but people are unaware of its genuine benefits. So multiple awareness programmes have to be organized according to local language and culture.

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REFERENCES

1. Peden M et al, eds. World report on road traffic injury prevention. Geneva: World Health Organization, 2004 (www.who.int/world-health-day/2004/infomaterials/world_report/en/, accessed 4 July 2006).
2. Mohan D. Traffic safety and health in Indian cities. *Journal of Transport and Infrastructure*, 2002;9:79-94.
3. <https://www.thehindubusinessline.com/news/india-accounts-for-11-per-cent-of-global-death-in-road-accidents-world-bank/article33834556.ece>.
4. <https://www.kraftlaw.com/motorcycle-injury-attorney/injuries-in-motorcycle-accidents>.
5. Center for Health Information Management and Epidemiology. Crash Outcome Data Evaluation System (CODES), 1993. Jefferson City, MO: The Center; 1997
6. Liu BC, Ivers R, Norton R, Boufous S, Blows S, Lo SK. Helmets for preventing injury in motorcycle riders. *Cochrane Database Syst Rev*. 2008;(1):CD004333.
7. Mathur AK, Gupta S, Bandhu A. A Baseline Study on Pattern of Helmet Use in the State of Rajasthan, India. *Journal of Health Management*. 2017;19(3):417-434.
8. Sreedharan J., Muttappillymyalil J., Jeesha B.D., Haran C., Determinants of safety helmet use among motorcyclists in Kerala, India. *J Inj Violence Res*. 2010 Jan; 2(1): 49-54.
9. MacLeod JB, Digiacomio JC, Tinkoff G. An evidence-based review: helmet efficacy to reduce head injury and mortality in motorcycle crashes: EAST practice management guidelines. *J Trauma*. 2010;69(5):1101-11.
10. Paravar M, Hosseinpour M, Salehi S, Mohammadzadeh M, Shojaee A, Akbari H, et al. Pre-hospital trauma care in road traffic accidents in kashan, iran. *Arch Trauma Res*. 2013;1(4):166-71.
11. Gennarelli TA, Champion HR, Sacco WJ, Copes WS, Alves WM. Mortality of patients with head injury and extracranial injury treated in trauma centers. *J Trauma*. 1989;29(9):1193-201.
12. Helmets: a road safety manual for decision-makers and practitioners. Geneva, World Health Organization, 2006.
13. Dischinger P.C., Gabriel E. R., Shiu M. Ho, Braver E.R., Injury Patterns and Severity Among Hospitalized Motorcyclists: A Comparison of Younger and Older Riders *Annu Proc Assoc Adv Automot Med*. 2006; 50: 237-249.