A Descriptive Study of Pattern of Injuries in Driver and Pillion Rider Victims of Fatal Two Wheeler Accidents

K.Prasannan, *[1] P.A. Sheeju[2]

[1] Professor, Forensic Medicine & Police Surgeon, GovernmentMedical College, Kozhikode,Kerala.

[2.] Assistant Professor, Forensic Medicine & Assistant Police Surgeon, Government Medical College, Thrissur, Kerala.

Research Article

Article Info

Recived on:10/06/2015
Accepted on: 18/06/2015
Published on: 22/06/2015

QR Code for mobile

Literati Open Access

ABSTRACT :

Background: Motor vehicle crashes are a major cause of fatality all over the world. By 2020 motor vehicle injury is projected to become the third leading contributor to the global burden of disease in the world. Motor cyclists are about 25 times more likely than car occupants to die in Road Traffic Accidents. The present study is aimed to analyse the injury pattern in driver and pillion rider victims of two wheeler accidents.

Method: In this study 135 (127 males and 8 females) cases of victims of fatal two wheeler accidents in the age group of 11 to 74 years were studied. The details of the accident were collected from police inquest, statements from investigating officers, statements from relative/witnesses. In hospitalised cases details including laboratory investigation reports are collected from case sheet. General examination findings and injuries are documented and also photographed.

Results: It was observed that majority of the victims were between 20 and 50 years. Skilled labourers constituted 18.5%. Next were students. only 38.1% were using helmet at the time of accident. In 27.4% of cases definite history regarding helmet use was not available. Probably the relatives may not disclose the non usage of helmet for obvious reasons. It was observed that majority of the vehicle involved was motorcycle. Majority of accidents were front on collisions. Type of other vehicles involved in accidents was heavy vehicles. Among 135 cases alcohol odour was present for stomach contents in11 victims, 8.3% of drivers and 7.5% of pillion riders.Maxilla was fractured in 11.9% in drivers and 17.64% in pillion riders. Mandible was fractured in in 14.28% and 13.72%. Incidence of vertebral fracture was similar in both groups. (14.28% and 14.72%). In drivers and pillion riders head injury was the leading cause of death (70.23% and 66.66%). It includes all cases where head injury was the only cause or occurred in combination with other injuries. Head injury alone was the cause of death in 47% of drivers and 52.9% of pillion riders. Chest injury was the next frequent cause of death. (32.14% and 39.21%). Abdominal injury in 26.19% and 15.68% each. Vertebral column injury in 3.57% of drivers and 7.84% of pillion riders.

Conclusion: We conclude that in majority of cases the two wheeler involved was motor cycle and the other vehicle involved were heavy vehicles. The commonest modes of accidents were front on collisions, followed by skid and fall. Only 38.1% of drivers were wearing helmet at the time of accident. Incidence of scalp contusion in pillion riders were more, may be due to helmet use in38.1% of the drivers. Scalp lacerations were more in drivers. Pillion riders showed more fissure fractures in skull vault. Base of skull fractures showed similar incidence in both groups.SDH and brain stem injuries were slightly more in pillion riders. Intra cerebral haemorrhage was seen in pillion riders only.

Key words: Head injury, Road traffic accidents, pillion rider, two wheeler accidents

INTRODUCTION:

Trauma is a major cause of morbidity and mortality worldwide for death of majority of victims in road traffic accidents (RTA). According to World Health Organization more than 90% of deaths occur in low and middle income countries [(1)]. By 2020 Road Traffic Accident injuries will rise in the 6th place as a major cause of death worldwide [(2)]. In many countries roads are planned and built to allow motor vehicles to travel faster while insufficient thought is given to the needs of two wheelers and pedestrians. Injury to the head is the commonest cause of mortality and morbidity following two wheeler crashes. Motor cyclists are about 25 times more likely than passenger car occupants to

Corresponding author:
Dr. K.Prasannan
Professor, Forensic Medicine & Police Surgeon, GovernmentMedical College, Kozhikode,Kerala.

doi: 10.15272/ajbps.v5i45.715

Conflict of interest: Authors reported none

die in traffic crashes [3]. About 20% of deaths in RTA are in motor cycle accidents [4,5].Most of the people were young males who are in the productive period of life. This places heavy burden on the family social and medical resources. Two wheeler riders are more vulnerable to RTA and for sustaining injuries. This group of road users do not have protective shell around them and therefore are more at risk than those inside vehicles. They are at additional risk when their needs have not been taken into consideration during the planning of road construction. The present study was undertaken to compare the injury pattern in drivers and pillion riders in two wheeler accidents.

MATERIALS AND METHODS:

Participants

In this study 135 (127 males and 8 females) cases of victims of fatal two wheeler accidents in the age group of 11 to 74 years, brought for autopsy in the Department of Forensic Medicine, Medical College Kozhikode were studied. The present study was conducted from Oct 2010 to August 2011.

Inclusion and exclusion criteria

All persons dying following two wheeler accidents are considered for the study. Two wheelers include motor cycles, scooters and mopeds. All the females were pillion riders Bicycles were excluded from the study. Accidents include all types, against all types of vehicles running on the road, collision with any object, surface or any animal or fall from vehicle.

Methods

The details of the accident were collected from police inquest, statements from investigating officers, statements from relative/witnesses. In hospitalised cases details including laboratory investigation reports are collected from case sheet. General examination findings and injuries are documented and also photographed.

Ethical considerations

The present study was approved by Institutional ethics committee, Government Medical College, Kozhikode.

Data analysis

Data was analysed by SPSS 20.0

RESULTS

Results were presented in table no1 to table no13.

It was observed that majority of the victims were between 20 and 50 years (table-1). Skilled labourers constituted 18.5%. Next were students (table no: 2). only 38.1% were using helmet at the time of accident. In 27.4% of cases definite history regarding helmet use was not available. Probably the relatives may not disclose the non usage of helmet for obvious reasons (table no:3). It was observed that Majority of the vehicle involved was motorcycle (table no:4). Majority of accidents were front on collisions (table-5). Type of other vehicles involved in accidents were heavy vehicles (table no: 6). Among 135 cases alcohol odour was present for stomach contents in11 victims, 8.3% of drivers and 7.5% of pillion riders (table no:7). Injuries present in victims were presented in table no 8 to table no 13. Maxilla was fractured in 11.9% in drivers and 17.64% in pillion riders. Mandible was fractured in in 14.28% and 13.72%. Incidence of vertebral fracture was similar in both groups.(14.28% and 14.72%). In drivers and pillion riders head injury was the leading cause of death (70.23% and 66.66%). It includes all cases where head injury was the only cause or occurred in combination with other injuries. Head injury alone was the cause of death in 47% of drivers and 52.9% of pillion riders. Chest injury was the next frequent cause of death. (32.14% and 39.21%). Abdominal injury in 26.19% and 15.68% each. Vertebral column injury in 3.57% of drivers and 7.84% of pillion riders.

Age-years	Frequency	%
10-19	14	10.37
20-29	55	40.74
30-39	26	19.25
40-49	21	15.55
50-59	8	5.95
60-69	10	7.40
70-79	1	0.74

Table- 1: Distribution of accidents according to the age of the victim (n=135)

Occupation	frequency	%
Student	18	13.3
Business	9	6.7
Govt. Service	4	3
Skilled Labourer	25	18.5
Executive	2	1.5
Sales man	9	6.7
Manual Labourer	17	12.6
Professional	4	3
Others	47	34.8

Table-2: Occupation of the victims:. (n=135)

	Driver N=84	%	Pillion Rider N=51
Helmetted	32	38.1	0
Non Helmetted	29	34.5	51
Not known	23	27.4	0
Total	84	100	51

Table-3 Helmet use (n=135)

Type	frequency	%
Motor bike	129	95.6
Scooter	6	4.4
Total	135	100

Table-4: Type of Vehicle used by victims involved in the accident

Accident	%
Front on Collision	46.70
Rear end hit	11.10
Skid and fall	10.40
Hitting object/surface	6.70
Hit while overtaking of Another vehicle	5.90
Side on collision	5.90
Two wheeler overtaking Another vehicle	4.40
Tail gaiting	2.20
Giddiness and fall	1.50
Trying to open umbrella	1.50
Others	1.50
Not known	1.50

Table-5: Nature of accidents (n=135)

Vehicle type	Frequency	%
Bus	29	21.5
Lorry	23	17
Tipper	15	11.1
Bike	14	10.4
Car	13	9.6
Jeep	3	2.2
Omni van	3	2.2
Pick up van	2	1.5
Auto	1	0.7
Tempo	1	0.7
Hit a bike & run over lorry	1	0.7
Bicycle	1	0.7
Not Known	1	0.7

Table-6: Type of other vehicles involved in the accident

	Present	%
Drivers NN=84	7	8.3
Pillion riders N=51	4	4
Total N=135	11	8.1

Table 7: Sign of alcohol intake

Injury	Frequency %
Contusion	47.4
Laceration	14.8
Contusion+ Laceration	9.6
Abrasion	5.2
Abrasion+ Contusion	2.2
Abrasion+ Contusion+ Laceration	1.5
Abrasion+ Laceration	0.7

Table-8: Injuries to scalp

Injury	Driver N=84 %	Pillion rider N=51 %
Contusion	61.9	62.75
Laceration	29	23.5
Abrasion	8.33	11.76

Table-9: Scalp injuries in drivers and pillion riders

Fracture	Driver N=84 %	Pillion rider N=51 %
Fissure Fracture Vault	29.76	37.25
Comminuted Fracture vault	21.43	15.69
Depressed Fracture	7.14	9.8
Diastatic Fracture	3.57	5.88
Fissure Fracture base	35.71	37.25
Comminuted Fracture Base	23.81	39.22

Table- 10 Skull fractures in drivers and pillion riders

Injury	Driver %	Pillion rider %
Focal brain injury	83.33	70.59
Diffuse brain injury	14.28	19.6

Table-11: Brain injury in drivers and pillion riders

Haemorrhage	Driver %	Pillion rider %
SAH	67.86	65
SDH	30	35.29
Brain stem	20	24
Intra ventricular	15.48	16
Intra cerebral	10	0
Cerebellar	2	2
EDH	2	2

Table -12: Intra cranial haemorrhages in drivers and pillion riders

Injury	Driver %	Pillion rider %
Chest	51.19	43.13
Abdomen	35.71	33.33
Pelvis	13.09	11.76
Limbs	27.38	19.6

Table -13 Other injuries in drivers and pillion riders

DISCUSSION:

Injuries to the victims of two wheeler accidents constitute a significant proportion of severe traffic accident injuries. In the present study pattern of injuries especially injuries to head was based on 135 cases of autopsy done in Department of Forensic Medicine, Government Medical college, Kozhikode from October 2010 to August 2011. The objective of the study was to find the pattern of injuries especially head injury in victims of fatal two wheeler accidents in drivers and pillion riders.

The majority of the vehicles driven by the victims were motor cycles (95.6%). Skilled labourers were the most victims (18.5%) followed by students (13.3%). In African and western countries majority of the victims were students [6]. The majority of the vehicles involved in collision were heavy vehicles - bus, lorry and tipper, together form about 50%. In a study by Harnam Sigh et alit constituted 36.6% [7]. In the study by Martinus Ritcher cars were the major collision opponents [8].The common mode of accident involving riders and pillion riders were front on collision. Drivers 50% and pillion riders 41.2%. Skid and fall was marginally high in pillion riders (11.8%) compared to riders (9.5%). The commonest mode as per study by Nupur pruthi et al was skid and fall, 45.5%[9]. Only 38.1% were wearing helmet in spite of helmet wearing being made a statutory requirement.

Scalp injuries were present in 81.48% of cases. The victim's sustained contusion more than any other injury (47.4%), followed by laceration (14.8%). Incidence of contusion in pillion riders was more, may be due to the protection by helmet in drivers. Scalp laceration was more in drivers. In facial injuries abrasion was more in drivers (27.4%) than in pillion riders (19.6%).

In skull fractures fissure fracture was present in 32.59% of cases. Pillion riders showed more incidence than drivers, may be due to the protection by helmet.Incidence of skull base fissure fracture was almost same in both groups.Of all victims 78.51% presented with focal brain injury. Sub dural haemorrhage and brain stem haemorrhage were slightly higher in pillion riders. Intra cerebral haemorrhage as seen in drivers only (10%). Incidence of brain contusions were almost same in both groups. Vertebral fracture was seen in 14.07% of cases.horacic vertebral fracture was more in pillion riders.In the present study in 135 victims other than head injury, chest injury was the common injury. It was present in 48.14%, followed by abdomen (36%) limbs (24%) and pelvis (13%). Out of 135 cases head injury was the cause of death in 49.6%. Incidence of head injury was slightly more in pillion riders, may be due to helmet use by drivers.

Conclusion

We conclude that in majority of cases the two wheeler involved was motor cycle and the other vehicle involved were heavy vehicles. The commonest modes of accidents were front on collisions, followed by skid and fall. Only 38.1% of drivers were wearing helmet at the time of accident. Incidence of scalp contusion in pillion riders were more, may be due to helmet use in38.1% of the drivers. Scalp lacerations were more in drivers. Pillion riders showed more fissure fractures in skull vault. Base of skull fractures showed similar incidence in both groups.SDH and brain stem injuries were slightly more in pillion riders. Intra cerebral haemorrhage was seen in pillion riders only.

REFERENCES:

1. Global status report on road safety. Time for action.2009.WHO. (www.who.int/violence-injury-prevention/road safety status/2009 accessed 31 December 2010.

2. Global burden of disease: 2004 update. Ganeva, World Health Organization,2008(http://www.who.int/healthinfo/global_burden_disease/GBD report_2004 update_AnnexeA.pdf,accessed 22 November2010.

3. Traffic safety facts.2009 Data. National Highway Traffic Safety . U.S Department of transportation. October 2011, accessed 20 December 2011.

4. National Crime records bureau. Death and suicides in India.2008

5.Gupta S, Roy Choudhury U.B,Deb P.K et al. Demographic study of fatal craniocerebral Road Traffic injuries in North Bengal region. Medicine Science and Law 1979;19(3):186-194

6. B.A Solagberu, C K P Ofoegbu,A A Nasir et al. Motor cycle injuries in a developing country and vulnerability of riders, passengers and pedestrians. Injury prevention 2006;12:266-8

7. Harnam Singh, A.D Aggarwal. Fatal road traffic accident in motor cyclists not wearing helmets. J Punjab Academy of Forensic Medicine Toxicology 2011;11(1): 9-11

8. Martius Ritcher, Dietmar Otte, UUwe Lehmann et al. Head injury mechanisms in hlmet protected motor cyclists: Prospective multicentric

study. Journal of Trauma, Injury, infection, and Critical care 2001;51:949-958

9. Nupur Pruthi, BA Chandramouli, Sampath S, B I Devi. Patterns of head injury among drivers and pillion riders of motorised two wheeler vehicles in Indian Journal of Neurotrauma 2010;7(2):123-128

Cite this article as:
K.Prasannan, P.A. Sheeju. A Descriptive Study of Pattern of Injuries in Driver and Pillion Rider Victims of Fatal Two Wheeler Accidents. Asian Journal of Biomedical and Pharmaceutical Sciences, 5(45), 2015, 29-32.