Original Research Article

Study of Limb Injuries in Road Traffic Accident Cases-An Analytical Study in IMS And SUM Hospital, Bhubaneswar, Odisha

Srimannarayan Mishra[1] , Tapaswini Mishra[2], Pusparaj Samantsinghar[3], Nirupama Samantaray[4]

[1]Deputy Medical Superintendent, AMRI Hospital, Bhubaneswar, Odisha, India, [2]Associate Professor, Department of Physiology. [3]Professor, [4]Professor, Department of Forensic and Toxicology. IMS and SUM Hospital, Siksha 'O' Anusandhan University(Deemed to be) Bhubaneswar, Odisha, India

Abstract

Aim and Objectives: To know: i) The age and sex wise distribution of road traffic accidents (RTA) cases. ii) Pattern of limb injuries sustained. iii) Type of vehicle involved and speed of vehicle**. Materials and Methods:** The study was carried out in the department of F.M.T in association with the Department of Accident & Emergency, Department of Orthopaedics, and Department of Surgery of IMS and SUM Hospital, Bhubaneswar. Duration of study June 2015- July 2017. Study type- cross sectional study. The number of cases were 200. **Results:** Of the 200 patients in the present study 90.5%(181) were males and only 9.5%(19) were females. Two wheelers were the most unsafe in the vehicles category involved in road traffic accidents (79.5%). Vehicle travelling between 60-80 km/hr are more susceptible (58%) to injury/accident. The most common injuries were laceration & fracture (30%) . Right lower limb(38%) was mostly involved.

Key words: *Limb injuries, road traffic accidents, vehicle type, pattern of injuries*

Introduction

Travel today is an essential requirement for the present generation. Due to increase in population in urban area and there are many reasons to travel, mobility is the primary need. Road traffic accidents are a major cause of death which is occurring in developing country now a days. In the world it is ranked in 9th position by 2020[1]. Road traffic accidents cost between 1% to 2% of their gross national product in low income and middle income countries which is more than the total development aid received by these countries[2].Road traffic accidents are multifactorial in nature which involves human, environmental factors and vehicular factors. In the world, India is one of the leading country in road traffic accident. It has been seen that there is steady rise in road traffic accidents in India and every minute there is an accident and every eight minutes a death. About eighty thousand people are killed and three lakhs forty thousand are injured every year[3]. The number of accidents caused by vehicle was four lakhs thirty thousand and six hundred and death due to vehicular accidents was one lakhs thirty three thousand nine hundred thirty eight and one lakh seventy thousand six hundred injuries according to the national crime record 2010[4]. Due to the injuries which is caused by road traffic accident, leads to increase in trauma patients admission at medical college and hospital which will take many lives and resources[5].

Aim and Objectives: To know: i) The age and sex wise distribution of road traffic accidents (RTA) cases. ii) Pattern of injuries sustained. iii) Type of vehicle involved.

Materials and Methods: The study was carried out in the department of F.M.T in association with the Department of Accident & Emergency, Department of Orthopaedics, and Department of Surgery of IMS and SUM Hospital, Bhubaneswar. Duration of study June 2015- July 2017. Study type- cross sectional study. Inclusion criteria: All patients of road traffic accident who were admitted to IMS & SUM hospital with upper & lower limb injuries. Sample was selected from all the cases of RTAs with definite history of victim either pedestrian, driver or passenger of a vehicle. Only limb

injuries were taken. Exclusion criteria: Patients with only head injury. Patient with abdomen injury, back injury without limb injury. A Total number of cases were 200 which was analysed during the study period, the details of each case were entered in a standard proforma designed for the study and the details of the vehicle types were obtained by the police and the attendants. Statistical analysis was made.

Results

Of the 200 patients in the present study 90.5%(181) were males and only 9.5%(19) were females

The present study shows that the Male: Female ratio of limb injury in road traffic accidents is 9.5:1 , i.e. the males were involved more than 9 times than females which was statistically significant. ($p< 0.001$).

The present study shows that the persons driving the vehicle are more susceptible (64%) to injury than the passengers or the pedestrians which was statistically significant. ($p< 0.001$)

The present analytical study shows that road traffic accidents occur mainly in the age group 20-39 years.

Table- 1: Frequency of distribution of vehicle involved in road traffic accident

Vehicle involved	Frequency	Percentage
Heavy vehicle	17	8.5
Four wheeler	12	6%
Two Wheeler	159	79.5%
Auto Rickshaw	4	2%
Other	2	1%
Total	200	100%

The above table shows that the two wheelers are the most unsafe in the vehicles category involved in (79.5%) followed by heavy vehicle (8.5%) .

Table-2: Frequency of distribution of speed of the vehicle in relation to road traffic accident

Speed of the vehicle	Frequency	Percentage
0-19 Km/hr	1	0.5%
20-39 Km/hr	1	0.5%
40-59 Km/hr	62	31%
60-79 Km/hr	116	58%
>80 Km/hr	20	10%

The above table shows that the .than other vehicles which was statistically significant. As the roads involved were mainly city roads there could have been less scope of travelling beyond 80 km/hr.

Table-3: Distribution of Type of Injury in road traffic accident

Type of injury	Frequency	Percentage
Abrasion	21	10.5%
Fracture	50	25%
Lacerated	12	6%
Abrasion & contusion	4	2%
Abrasion& dislocation	2	1%
Abrasion & laceration	8	4%
Abrasion & fracture	8	4%
Contusion & laceration	6	3%
Contusion & fracture	2	1%
Laceration & fracture	60	30%
Abrasion & laceration & fracture	17%	8.5
Contusion , laceration & fracture	3	1.5%
Laceration , fracture & dislocation	2	1%
Laceration , fracture & others	1	0.5%
Others	4	2%
Total	200	100%

The above table shows that the accident victims mostly suffered from laceration & fracture (30%) followed by fracture (25%). This could be due to hard surface of bitumen clad city roads and most vehicles travelling between 60-80km/hr that were involved in accidents.

Table-4: Frequency of Site of injury in road traffic accident

Site of injury	Frequency	Percentage
Right upper limb	32	16%
Right lower limb	76	38%
Left upper limb	13	6.5%
Left lower limb	38	19%
Right lower limb & left lower limb	6	3%
Right upper and lower limb	19	9.5%
Right upper limb and left upper limb	4	2%
Right lower limb and left upper limb	2	1%
Right upper limb, left upper limb and left lower limb	2	1%
Left upper limb and left lower limb	6	3%
Right upper limb and left lower limb	2	1%
Total	200	100%

The above table shows that in 38% cases right lower limb was involved. This combined with the fact that 2 wheelers were the most common vehicles involved indicates the struggle by the right handed driver to stop the vehicle at high speed resulting in fracture and laceration of the affected lower limb

Discussion

In the present study 181(90.5%) were males and 19(9.5%) were females, male to female ratio was found to be 9.5:1. The males are involved more than 9 times in road traffic accidents as than females. This is due to fact that male travel a lot more than females do, engage more in risk taking behaviour and are involved in outdoor activities of the family. This is also in accordance with the report of Rajnarayan R. Tiwari et al(2005)[6]. According to Frank et al males outnumbered females[7]. According to Nilambar et al the accident rates in males were 4.9 times higher than in females. In other study[8] male female ratio was found to be 9:1[9]. Abdul N. Batouk, et al also found that male female ratio was higher i.e 14:1[10]. M Ranjitet. al[11]also corroborates with the present study. The males outnumbered females in the ratio of 9:1[12,13,14,15,16,17,18,19,20,21,9].

The present analytical study shows that road traffic accidents occur mainly in the age group 20-39 years which resulted in the loss of expenditure in treating the patient as well as the productive age group. This is in accordance with Rajnarayan R. Tiwari et al[6]. Studies have reported that the high incident of road traffic accident in age group of 20-39years, this is due to the risk taking behaviour of the age group[22-25,26]. According to Abdul N. Batouk, the highest accidents were seen in the age group 21 – 49 years[10]. This shows that the people who are most active and productive age group are involved in road traffic accidents, which add a serious economic loss to the community[25,27]. Basu Nandy Mukhopadhyay and Majumdar et. al 1977-78. Maximum involvement (29.5%) in road accidents were seen in the age group 26-40 years, followed by age range 16-25 years (22.5%) and 41-55 years (16.5%). There were 87% male victims in road accident against 13% in females[28]. Rao D analyzed 254 cases and found that major age group between 21-30 years were affected (31.51%)[29]

G Gururaj (2008) Analyzed cases of road traffic accident in the year of 2005 and found that majority of the victims were of the age group15-44 years and belongs to the poorer section of the society[30]. Behera C et al 2009studied commonest age group involved was 21 to 30years (44.67%)[18]. Most common age group involved is 21-30 year[19]. Kuchewar SV et al (2012) analyzed 216 RTA cases and found 50% of cases are of age group 20-40 years[20]. Maximum number of victims belongs to age group between 21-30 years 28% followed by 31-40-years 20%[21]. JhaNilambar et al(2003) analysed. According to the author the maximum accidents occurs 20-29years with average age group 31.5 years[9].

The most common vehicle involved in the present study was motorized two-wheelers79.5% (179). This is because the study is carried in urban area where the two wheelers vehicle is most common mode of transport. This is in accordance with the other studies [8,22-24,26,31].

The present study shows that the vehicle travelling between 60-80 km/hr are more susceptible 58%(116) to injury/accident than other vehicles which was statistically significant. As the roads involved were mainly city roads there could have been less scope of travelling beyond 80 km/hr. Fildes B.N et al(1994) studied that the fractures depends on the velocity of the vehicle to its impact and occurred at 48m/hr or less[32]. According to Jha et al. two wheelers drivers(61.2%) were commonly involved in accidents because of their high speed driving and also due to less stability while driving[9].

The present study shows that the accident victims mostly suffered from laceration & fracture(30%) followed by fracture(25%). The present study shows that in 38% cases right lower limb was involved. This combined with the fact that the most commonly vehicles involved were two wheelers indicates the struggle by the right handed driver to stop the vehicle at high speed resulting in fracture and laceration of the affected lower limb. Tonge et al (1977) studied 76 motor cyclist victims and found that injuries to upper limb occur most frequently. Fildes B.N et al(1994) studied lower limb injuries to car occupants in Australian car accidents. There was a study in Melbourne which shows that fractures occurred 88% of crashes with lower limb injury[32]. The most common injuries were tibial fracture[19]. Patil Satish Supriya et al(2007) also studied that lower limb fracture(46.3%) were more common than upper limb(24.7%)[26]. This is in corroboration with the present study.

Summary and Conclusion

From our study it is now clear that Laceration and fracture injuries are common limb injuries being reported and two wheelers are mainly responsible for RTA limb injuries. Two wheeler male drivers outnumber female and pillion riders in sustaining injuries to limbs.

The numbers of two wheelers are likely to increase in the future along with road traffic accidents as a whole. Therefore the drivers should be educated to drive safe in the road . There should be a road safety programme for two wheelers for the prevention of accidents in the cities. To prevent the two wheeler accident the following should be done:- The roads should be designed and properly maintained . Separate roads for two wheelers should be there. Strict traffic regulation. Carrying children on two wheelers should be avoided. Road side alcohol analysis for riders should be there. Driving license should be strictly checked. Driver and pillion should wear helmet mandatory. Designing of safer vehicle. Banning unlicensed and young drivers on roads. Improvement of trauma care centres.

After analysing the data from the present study it appears to be easier to distinguish between various injury patterns and injuries sustained due to RTA coming to SUM Hospital.

Ethical Clearance- Taken from- Ethics committee, Institute of Medical Sciences (IMS) and SUM Hospital, Siksha 'O' Anusandhan University.

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Conflict of Interest: The authors declare that there is no conflict of interest.

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