

Original Research Paper

A Study on Trends and Pattern of Head Injuries, Due to Road Traffic Accidents Involving Two Wheelers

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Abstract

The incidence of head injuries is growing with greater mechanization in industry an increase in high velocity mode of transport. The present study is conducted on 187 cases of fatal road traffic accidents of all age groups. All the cases of head and neighboring injuries admitted in respective health centers from January, 2013 to January, 2014, for treatment are included in the study. The pattern and distribution of head injuries due to Road Traffic Accidents (RTA) with/without helmet and other associated life saving measures are analyzed. Most of the cases of head injury belong to younger age group (21-40) years comprising of (70%) with male and (30%) with female of the cases related to road traffic accidents. Scalp injury in 100 cases whereas 60 cases are of the skull fracture and extradural haemorrhage 15% is most common intracranial injury followed by subdural haemorrhage (5%).

Key Words: Head injury, Road traffic accidents, Head injuries, Two-wheelers

Introduction:

Head injury is one of the major public health problems which occurred most of the times due to certain types of accidents and has attained epidemic proportion in India.

The incidence of head injuries is growing with greater mechanization in industry an increase in high velocity mode of transport. According to 2012 report of National Crime Record Bureau of India 120,502 persons were killed in fatal RTAs and out of those about 66276 (55%) were killed while riding on two wheeler. [1]

The mortality rate is steadily rising. In many countries around the world, injuries mainly head injuries are the major cause of death. Approximately 18% of all unintentional deaths worldwide occur in children below the age of 18 years. Road accidents account for 17% of all deaths in this age group.

In India accidental death of children accounts about 19% of total such death. It is outside conflict zones, the dangerous place on earth, and a strip of law less asphalt where an angry army of humans and a bewildering variety of vehicular traffic battle for space and the right of way.

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It is quite literally, death trap. India's road accident deaths are more than only other single cause. Every hour, 13 people die due to road accidents, the highest in the world.

Every 10th person, who dies in road accidents, is an Indian. Scarier is the fact that road fatalities in India have been rising at the rate of 10% a year and paradoxically have only increased even as massive amounts of money have been pumped into improving roads and adding new highways, flyovers and express ways. Study showed that a 10% increase in speed leads to a 35% increase in road accident fatalities.

Here is another shocking statistics a leading cause of road deaths is drunk riders (or drivers), others factors that lead to the high incidence of road accidents, poor traffic management, bad roads, total lack of observance of traffic rules, no legal deterrents, jaywalking pedestrians and deadly mix of slow and fast moving traffic, including the fact that a sizable number of fatalities due to road accidents is avoidable for want of better road safety management and availability of prompt medical help.

In fact, drunken driving accounts for about 36% of deaths involving motorized two wheelers. Similarly, wearing a helmet can reduce the risk of death by 40%. It is also observed that about 20% accidents are occurring to those both male and female, who are using mobile phone while driving motorized two-wheeler. The tragedy is that these basic

road safety measures are either not followed or blatantly violated in India.

The Global States Reports on Road Safety (GSRRS) report said that, "In India roads are planned and built to allow motor vehicles to travel faster while insufficient through is given to the needs of pedestrians and cyclists. Most people use their motorized two-wheeler as a murder weapons as they drive with intense rage.

Speed thrills also calm them down". In India poor public transport is a major cause of accidents. In reality, driving licenses are like a license to kill. In many cities there is no need even to go to the licensing authority to get a license made, thanks to touts!

Two-wheelers contribute about 65% of total vehicles ply or running on the roads of Bhopal city and nearby places. Few reliable and realistic epidemiological data are available for the study of RTA involving motorized two wheelers with and without using helmet.

The main aim and objective of the present study is to find out the trend and pattern of head injuries and other body part injuries due to RTA with/without helmet and other relating risk factors and to provide a suggestive measure in order to control and reduce such injuries.

Head injury as defined by National Advisory Neurological diseases and stroke council, is a morbid state resulting from gross or subtle structural changes in the scalp, skull and/or contents of skull, produced by mechanical forces.

Injury to brain without fracture of skull is not uncommon; though fracture of skull is usually accompanied by some degree of injury to the brain. [2] The study of pattern of skull fractures is important for head being the most exposed and prominent part of body.

Material and Method:

In the present study 187 cases of various types of injuries pertaining to head injury occurred due to accidents mainly by motorized two wheelers or those cases hit by other light and heavy vehicles to riders and pillions of two wheelers. Most of the cases are selected from the present study are those victims who were admitted or brought for the medical help in tertiary care hospital, Bhopal (M.P.) and some cases are admitted in other medical Centres of Bhopal city after fatal road traffic accidents.

The analysis of 187 cases of head injury due to RTA for a period of about 13 months from January, 2013 to January, 2014 has been performed. After victim is brought and admitted to the hospital, a brief history pertaining to injury is recorded from relatives and eye witnesses

regarding cause of manner of injury, time and place of injury, whether homicidal or accidental period of survival after following head injury and approximate age and sex of the person (victim).

Sometime when a motorcyclist or two wheeler riders are hit by a heavy four wheeler (such as truck, bus, multiaxial vehicle) the driver of two wheeler fall down, consequently his/her is crushed by wheel of the heavy vehicle leads to burst fracture tearing multiple laceration of brain matter, leading to instantaneous death of motor cyclist on the spot.

Head injuries are examined critically and methodically, with available facilities in the hospitals. The inner aspect of the scalp was also examined for want of our study. Fractures of the skull are examined in detail as to the type, extension and location of injury.

Fracture of skull tested by CT scan and MRI. We have examined the cases thoroughly and hence found some depressed fracture, cervical fracture, crushed fracture etc.

Observations and Results:

In all 187 cases are studied during one year period. Male comprised 83% and female 17% makes male: female ratio about 5:1. The age in year is grouped taking interval of 10 years starting from 0-80 years. The youngest victim is 9 years old boy and the oldest is 74 year male. Highest victim of RTA found in the age group 21-40 years (55%) and minimum in both extreme group 0-10 and 70-80. (Table 1)

As per the information gathered from our study, the largest number of fatal road traffic accidents occurred during 8.00 A.M.-12.00 Noon and 20.00 -24.00 and lowest number of cases reported to occur during the period 00.01-4.00. But the fatal cases of RTA are occurred in between 11.30 P.M. to 3.30 A.M. because this period is considered as most dangerous period for driving any kind of vehicle. (Table 2)

In our study it is found that pedestrians 31.1% and vehicular occupants 68.9% involved in accidents. (Table 3)

In our study majority of victims did not use helmets (74%) and only (26%) using helmets (male and female both included). (Table 4) Majority of the victims met with head injury studied are riders (75%) followed by (15%) head injury of pillion riders and remaining have minor injuries in the other part of the body.

Regarding kind of injury, contusion of the scalp is most common. The laceration of the scalp is observed and noted in (20.5%) cases. Also similar findings are obtained for contusion (88.2%) and laceration (31.6%) to the membrane. As far as injury to the brain is

concerned, contusion is seen in (92.5%) case and laceration is only (30.5%) cases. (Table 5)

It is found that the variety of intracranial haemorrhage is subdural haemorrhage 95% followed by subarachnoid haemorrhage 90%, intra-cerebral and extradural haemorrhages are present in 15% and 8% of cases respectively, whereas intra-ventricular haemorrhage is found in 6% cases. It is found that 5% cases are of crushed fracture found in stem of brain, 4% are of depressed fracture and 2% cases are of cervical fracture. Interestingly, 5% cases of isolated intracranial haemorrhage are observed.

Discussion:

There is a rapid rise in the number of the vehicular accidents in the present era in both rural and urban areas. Tremendous growth in the road transport sector as well as population explosion acts as catalyzing factors responsible for increasing number of accidents.

Since accidents are multi factorial in causation, so the inter-sectoral approach to both prevention of accidents and taking care of the injured persons are essential.

In our study it is found that pedestrians 31.1% and vehicular occupants 68.9% involved in accidents similar to other studies. [3-5, 10, 12] This reflects the ignorance of traffic rules and traffic signal, talking over the mobile phone, using ear phone and poor lighting of streets.

India has 2.2 % of vehicles in the world, but it accounts about 7% of the total cases of unintentional injuries. In the present study, males accounts 82.5% and females accounts 17.5% among all the total victims. [6]

Males being the breadwinner in majority of family are exposed more frequently to outside the home work rather than females.

This is only reason that there are maximum numbers of male victims who are either injured or dead rather than females. In our case the male to female ratio is 4.7:1.

Singh et al [10] showed that male to female ratio is 9: 1; Choudhary et al [11] showed that male to female ratio is 4.9:1. Arvind K. et al [12] reported that male to female ratio is 7.49:1.

A total of 187 cases of fatal road traffic accident belonging to all age groups and both sexes are under study. The victims of RTA are more between the age group of 21-40 years.

Least fatalities are observed in age group of 50-70 years and above it are about 2%, the main cause of this reduced number is due to more experience, more traffic sense, less tendency to take undue risks and some other non-desirable reasons. Our findings are in

general consistent almost with the number of fatalities reported by research workers. [7-9]

India is a developing country where poverty, illiteracy, unemployment, compel to more towards the urban area in search of employment, better medical facilities etc. In our study, we found that there is a significant relationship between place of accident and residence of the victims. It is observed that incidents are occurring more in the urban area rather than rural areas. Rash driving is also one of the reasons occurring more fatal road traffic accidents among youths.

Poor enforcement of traffic safety regulations, inadequacy of health facilities, alcohol intake, not wearing helmet, using mobile phone and ear phone etc. have contributed significantly to the rise in number of cases of traffic accident head injuries. It is noted that amongst the kinds of offending vehicles involved in RTA, Four wheeler (LMV's, HMV's) is observed to be the culprit. An increase in the number of heavy motor vehicles (government city buses and others) and congested narrow roads contribute to the rise in RTA.

Our study showed that Injury to two or more than two body regions such as head, legs, chest and spinal cords were found in majority of cases similar to other author's studies. [11]

Conclusion and Recommendations:

With exploding population rise in number of registration of vehicles every month, rampant encroachment of roads, unusual tendency of violating rules and chaotic traffic system have greatly contributed much fastly in head injury due to RTA.

Fatal road accidents are the major cause of some serious injuries in some parts of body below the age of 40 years. Children below 16 years of age are involved in accidents injuries. In order to prevent such unusual happening majority of people should be educated about traffic rules.

The pedestrian and cyclists should be given proper an effective training and should also be encouraged to obey traffic rules.

From the present study it is found that males in the age group (21-40) years are suffering more from road accidents.

It is amounting more in accidents by two-wheeler occupants than any other vehicles. It is essential to do much more studies on RTA and strict implementation of the already existing traffic rules.

References:

1. The Government of India, Ministry of Home Affairs, National Crime Record Bureau, Accidental deaths and suicides in India. 1999.

2. **Mukherjee J. B.** Forensic Medicine and Toxicology, p-390, Academic Publishers, Kolkata.
3. **Goyal Mukesh K, Kochar Shiv, Goel MR.** The correlation of Ct Scan (Head) vis a vis operative as well as Postmortem findings in cases of Head Trauma (A prospective study). JIAFM, 2003; 25 (4), pp. 125-132.
4. **Pathak et al.** Profile of Road Traffic Accidents and Head Injury in Jaipur, JIAFM, 2007; 30 (1), pp. 6-9.
5. **Patel N. S.** Traffic fatalities in Lusaka, Zambia. Med. Sci. Law, 1979; 19 (3), pp. 186-193.
6. **Menon A. et al.** Pattern of Fatal Head Injuries due to vehicular accidents in Manipal. JIAFM, 2005; 27 (1), pp. 19-22.
7. **Bahera C., Rautji R., Lalwani S. and Dogra, T. D.** A comprehensive study of motorcycle fatalities in South Delhi. JIAFM 2009, 31 (1), pp. 6-10.
8. **Dandona R., Kumar G. A., Raj T.S., Dandona L.** Patterns of road traffic injuries in a vulnerable population in Hyderabad, India, Inj. Prev. 2006; 12 (3), pp. 183-188.
9. **Khajuria B., Sharma R. and Verma A.** A Profile of the autopsies of road traffic accident victim in Jammu. J clin. Diag. Res. 2008; 86 (2) pp. 97-102.
10. **Singh H., Dhattarwal S. K.** Pattern and Distribution of injuries in fatal road accidents in Rohtak. JIAFM, 2004 26 (1), pp. 20-23.
11. **Choudhary B. L., Singh Deepak, Tirpudi B. H., Sharma R. K., Meel Veena.** Profile of Road Traffic Accidents cases in Kasturba Hospital of MGIMS, Sevagram, Wardha, Maharashtra, India, Medico Legal update, 2005, 5 (4). pp. 1-12.
12. **Arvind K., Sanjeev L., Deepak A., Rautji R., Dogra T.D.** Fatal road traffic accidents and their relationship with head injuries: An epidemiological survey of five years. Indian, J. Neurotrauma, 2008, 5 (2), pp. 63-67.

Table 2: Time Slots of Accidents

Time-Interval (Hrs.)	Victims	Percentage
00:01-4:00	10	5.3
4:01-8:00	15	8.0
8:01-12:00	74	39.6
12:01-16:00	20	10.7
16:01-20:00	25	13.3
20:01-24:00	43	23.0
Total	187	100.0

Table 1: Age and Sex wise Distribution of RTA Victims

Age-Group (Yrs)	Sex Distribution		
	Male	Female	Total
0-10	01	00	01
11-20	25	02	27
21-30	45	12	57
31-40	45	11	56
41-50	24	03	27
51-60	15	02	17
61-70	01	00	01
71-80	01	00	01
Total	157	30	187

Table 3: Distribution of Type of Victim

Type of Victim	Victim	Percentage
Pedestrians	58	31.1
Vehicular Occupants	129	68.9
Total	187	100.0

Table 4: Use of Helmet and Persons Died

Use of Helmet	RTA Victim (%)	Type of Person	Dead RTA Victim (%)
Yes	49(26)	Rider	06(3.2)
No	138(74)	Pillion	02(1.07)
Total	187(100)	Total	08(4.27)

Table 5: Head Injury-Contusion and Laceration in Scalp, Brain and Membrane

Type of Injuries	Scalp		Brain		Membrane	
	Present	Absent	Present	Absent	Present	Absent
Contusion	161 (86.1%)	26 (13.9)	173 (92.5%)	14 (7.5%)	165 (88.2%)	22 (11.8%)
Laceration	38 (20.5%)	149 (79.5%)	57 (30.5%)	130 (69.5%)	59 (31.6%)	128 (68.4%)