

EVALUATION OF MORBIDITY AND EPIDEMIOLOGY OF TWO WHEELERS ACCIDENTS IN CENTRAL INDIA

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ABSTRACT

Background: In the developing world, the current trends in population growth, industrialization and urbanization are putting heavy pressure on the transport network in general and on road system in particular. Some of the unwanted side effects of this growing traffic, such as congestion and noise pollution are immediately obvious to the individual. But others, such as the growing number of fatal and non-fatal injuries from Road Traffic Accidents (RTAs), are apparent only through aggregated statistics. These data reflects serious and growing problem, with absolute fatality and casualty figures are rapidly rising in the majority of developing nations and with morbidity and mortality rates considerably higher than in the developed world. The alarming increase in morbidity and mortality owing to road traffic accidents over the past decades is a matter of great concern globally. In this study we have done evaluation of morbidity and epidemiology of two wheelers (two wheeler vehicles are those vehicle which runs on fuel e.g. Motorcycle) accidents in Central India.

Methods: There were about 1514 patients who came to Accident and Emergency department of Acharya Vinobha Bhave Hospital from September 2014 to August 2015 with history of RTA, out of which 100 cases of road traffic accidents involving two wheelers were interviewed, using interview technique as tool for data collection.

Results: Out of 100 cases of road traffic accidents involving two wheelers 84 were male and 16 were female patients. Among 100 patients 46% had trauma by skidding of bike. Accidents took place at early morning (17%), afternoon (37%) and evening (31%) and night (15%) time. A number of patients (41%) were under influence of alcohol making it a major reason of trauma. Seventy five percent of the patients were driving the vehicle. In 25% of cases, patients were the pillion riders. In our study out of 100 patients, 99 were not wearing a helmet except for 1 patient. Among 100 patients, 54 were having orthopaedic injuries. Among the orthopaedic injuries, lower limb injuries were 46% and upper limb were 45%.

Conclusions: In our study we concluded that most of the accidents on two wheelers were of younger adults with predominance of male population and mostly occurred at daytime. Most of the drivers were under the influence of alcohol and were prone to accidents. The problems with two – wheelers accidents were condition of road, alcohol influence, and condition of vehicle.

Keywords: Road Traffic Accidents, Two – wheelers, Central India, Morbidity, Epidemiology

INTRODUCTION

Road traffic accidents is one of the important causes for morbidity and mortality worldwide, accounting for over a million deaths per year (1). Road traffic accidents are defined as a collision involving at least one vehicle in motion on a public/private road that results in at least one person being killed or injured (2). At present motor vehicle accidents rank ninth in order of disease burden and to be ranked third in the year 2020. Worldwide, the estimated number of people losing their life in road traffic crashes annually is around 1.2 million, while the number of injuries could be as high as 50 million (3,4). Over 80,000 persons die in the traffic crashes annually in India; over 1.2 million are seriously injured and about 300,000 get disabled permanently. Most of these accidents are from two wheelers (5).

In India, for individuals above 4 years of age, more life years are lost because of traffic crashes than due to cardiovascular diseases or neoplasms (6). While the mortality data can be collected with little effort, the data on non-fatal injuries is much difficult to receive as it depends on to which type of health care unit the victim reports for treatment. However as these injuries depends on a number of factors like type of accident, place of accident, colliding vehicle, site of impact, driver, etc. their study is quite important for setting priorities for prevention of such injuries.

Very few studies have been reported for studying the pattern of injuries in non-fatal accident victims in the Indian cities, particularly in Central India. In view of the above data, present cross sectional study was conducted with the aim to study the morbidity,

epidemiology and pattern of injuries of two wheelers accidents in Central India population.

MATERIALS AND MATERIALS

This prospective cross sectional study was carried out at our Tertiary Centre of University Hospital in Central India. There were 1514 patients who attended Accident and Emergency department between September 2014 and August 2015 with history of Road Traffic Accident, out of which 100 cases of road traffic accidents involving two wheelers were interviewed, the information about the patients was obtained directly by interviewing the patients and clinical examination. After data collection, the demographic and injury characteristics were recorded on a pre-designed performa. The site of injury, severity of injury and mode of road traffic accident was recorded as reported. The statistical analysis included calculation of percentages and proportions was carried out using appropriate statistical tests.

RESULTS

There were around 1514 patients who came to Accident and Emergency department during September 2014 to August 2015 with history of RTA, out of which 100 cases of road traffic accidents involving two wheelers were interviewed, Using interview technique as tool for data collection, the demographic and injury characteristics were recorded on a pre-designed performa (Table 1). The statistical analysis included calculation of percentages and proportions was carried out using appropriate statistical tests.

Our study comprised of 84 male and 16 female patients. Incidence of patients between 20 – 39 years was 51 in number whereas 11 were <20 years, 33 in 40 – 59 years and 5 were 60 years and above. The major mode of accident was skidding of two wheelers. This was either due to failure of brakes, or hard application of break or losing control. Out of 100 patients 46 (46%) had trauma by skidding of bike. Twenty six patients had history of collision with another vehicle followed by trauma by collision with other two-wheeler (14%).

Table 1

Age distribution of the patients

Age (years)	Frequency
<20	11
20-39	51
40-59	33
60 and above	5

Table 2
Mode of accident

Mode of accident	Frequency	(%)
Skidding of bike	46	46.0
Collision with another two wheeler	14	14.0
Collision with another vehicle	26	26.0
Hit by animal	8	8.0
Collision with non moving object	6	6.0
Total	100	100

Most of the major accidents took place during the day (37%) and evening time (31%). Major amount of accidents took place in local Pakka roads (well pitched road/concrete road connecting towns to district headquarters) and state highways (road connecting district places with each other and with state capital) together comprising of 94% of all accidents. Only 2 accidents took place at national highways.

A large number of patients (41%) were under influence of alcohol making it a major reason of trauma. Seventy five percent of patients were driving the vehicle. In 25% cases, patients were the pillion riders. In our study, out of 100 patients, 99 were not wearing a helmet except for 1 patient. Out of 100 patients, 83 suffered single type of injury and 17 suffered multiple types of injuries. Simple fracture occurred in 45 cases, 27 suffered only abrasions, 25 suffered lacerated wound, compound fractures were in 9 cases, contusion in 7 cases and crush injury occurred in 5 cases (Table 3).

Table 3
Types of injuries

Injury	Frequency
Abrasions only	27 (23%)
Crush injury	5 (4%)
Lacerated wound	25 (21%)
Contusion	7 (6%)
Simple fracture	45 (38%)
Compound fracture	9 (8%)

Figure 1
Site of the orthopaedic injury

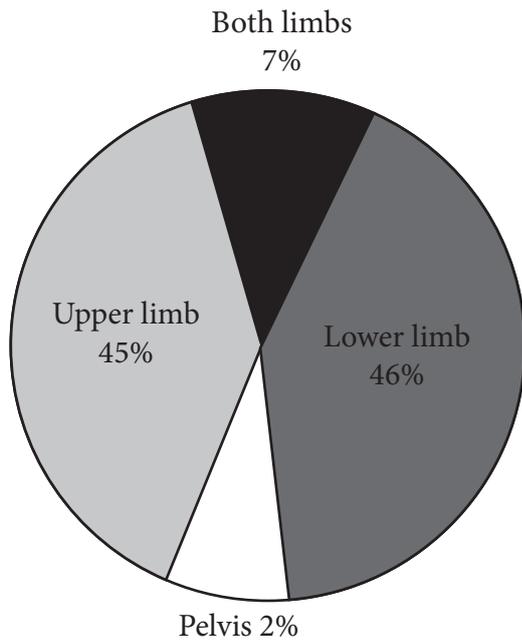
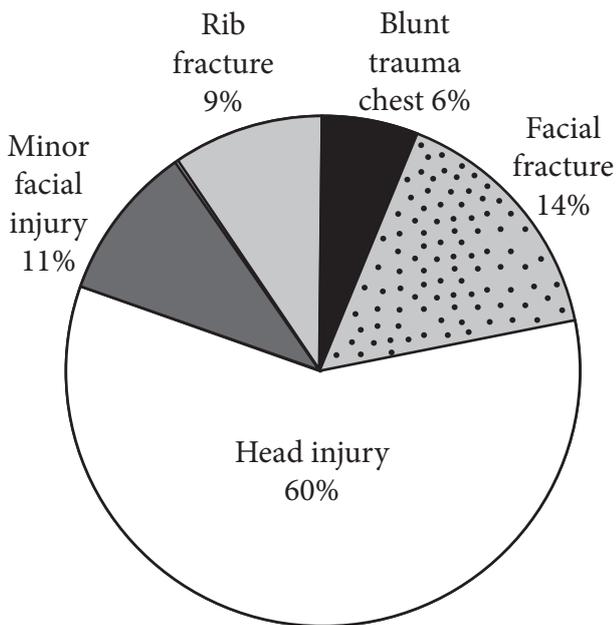


Figure 2
Associated non-orthopaedic injuries



Out of 100 patients, 54 were having orthopaedic injury. Twenty five were with lower limb trauma and 24 with upper limb injury. In orthopaedic injury, lower and upper limb accounts for 46% and 45% of cases. Thirty five patients had associated non-orthopaedic injuries in which head injury was the most common in 21 (60%) of cases followed by facial fracture and minor facial injury (Figure 2). Sixteen patients suffered minor head injury while 5 patients suffered major head trauma. In 38 cases major surgery was required/done. Sixty two patients were managed conservatively.

DISCUSSION

An accident is “occurrence in a sequence of events which usually produces unintended injury, death or property damage”. Road traffic accidents are a major global public health problem, but still neglected in developing nations requiring determined efforts for effective and sustainable prevention.

In our study we included the patients having accidents while driving two wheelers. It included the demographic profile of patient, causes of accident and the type of injuries sustained.

The patients who had sustained injures in our study were aged 20-39 years consisting of more than 50% of the study patients. It was found that persons aged 20-39 years accounted to 51(51%) of the 100 patients which is similar to a study done by Radha *et al* (7), where 42.5% of patients were aged between 26-40 years. Ezenwa ⁸ in Nigeria found that the commonest age group was between 22 to 30 years. Youngsters are more commonly involved in RTA especially with two wheelers as they are more frequent road users, more involved in rash driving, speeding, and commonly violating the traffic regulations. Although young drivers have better reaction time and reflexes, they have high risk taking behavior, sensation/thrill seeking behavior and alcohol consumption. As per mode of accident is concerned skidding of bike 46 (46%) and collision with other vehicle 26(26%) was the main mode of accident. This is similar to a study by Narinder *et al* (9) in north India and Bener *et al* (10) in Qatar. The reason is bike users are more prone to distract from the movements in surroundings and due to curvy roads in the villages they are frequently using brakes. As young persons are used to drive bikes at more speed they are more prone to apply sudden emergency brakes if a person or animal comes on their way making it a major cause of skidding of bikes.

In our study, 37 out of 100 accidents took place in day time, 31 out of 100 took place in evening hours and 17 in morning hours. This is similar to a study by Khajuria B, *et al* (11) in Jammu where maximum accidents took place in day times. It is against the result found in a study by Jirojwong *et al* (12) in Thailand, Verma *et al* (13) Delhi, Pathak *et al* (14) and Singh *et al* (15) in Haryana where most of the accidents took place in evening hours.

According to type of road where accidents took place the most common was Local Pakka Road 49(49%) and State Highway 45(45%). A similar study was done by Rahman *et al* (16) in Bangladesh who found 79.95% of RTAs occurred on highway. Mishra *et al* (17) in Western Nepal found 61.27% of victims of RTA on highway. Accidents on Local Pakka Road were more common because most of our accident study sites were connected with state highway which comprised of second highest number of accidents as compared

to national highway which had very few numbers of accidents. The reason is a state highway runs through the location of our study area, whereas nearest national highway is about 50km away. Also there was decrease in percentage of victims on village kachha roads/mud road as the speed of vehicle on these roads is less.

In our study almost all 99 patients were not wearing a helmet except for 1 patient. The Sreedharan *et al* (18) study in Kerala India found that most of the motorcyclists involved in RTAs were male aged less than 40 years. Suryanarayana *et al* (19) in India found only a third of his study subjects used a helmet. Singh *et al* (15) in Haryana found not wearing a helmet, not using indicator lights and not following speed limits were the three most common factors responsible for these RTAs.

The helmet wearing by the rider and the pillion rider is neither practiced efficiently nor stringent action is taken by law enforcers in rural areas. This amounts to little use of helmets, despite having a huge impact on outcome of severity of injury.

Use of alcohol among victims was found to be present in 41 out of 100 which is similar to a study by Mishra *et al* (17) in Western Nepal where 46.37% of the accident victims were found to have some evidence of alcohol consumption and out of the 32 positively identified to have consumed alcohol 84.37% succumbed to their injuries. Owoaje *et al* (20) in Nigeria, Nordqvist *et al* (21) in Sweden, Girjako *et al* (22) in Tirana, Sreedharan *et al* (18) in Kerala India, found in all their studies that alcohol consumption contributes directly or indirectly to more accidents.

Alcohol has a wide range of psychomotor and cognitive effects that increase accident risk on reaction times, coordination, vigilance, cognitive processing, vision and hearing. The effects of alcohol impairment have been shown to begin at low blood alcohol concentration. Even a slight delay in adequate response makes a huge difference in the outcome. At very high speeds a delay in decision to brake by millisecond results in a fatal accident.

In our study, 83 out of 100 patients's found to sustain a single type of injuries and 17 patients sustained 2 or more type of injuries or injuries at multiple sites. In this study simple fractures of any bone was the most common type of injuries found in 35% of cases followed by simple abrasions and lacerated wound. It is similar to a study done by Ganveer *et al* (23) in Central India where Fracture of the bones was the most common injury afflicted to the victims followed by other injuries like blunt injury, abrasions and lacerations

Verma *et al* (13) in his study in Delhi found limbs were the most affected parts followed by head injury. Superficial injuries were most common, followed by fractures, crush injuries and concealed injuries. Owoaje

et al (20) in Nigeria found the commonest types of injuries sustained were abrasions and cuts and fractures of the upper and lower limbs. Fitzharris *et al* (11) in India (urban) found that open wounds and superficial injuries to the head and upper extremity and lower extremity were the most common injuries. Nearly 10% of victims sustained an intracranial injury, including associated fracture of the bones of the head. Ranjana *et al* (24) found similar findings where the most common types of injury were lacerations 38.28%, abrasions 38.15% followed by contusion 19.20%. Singh *et al* (25) in North India found penetrating type of injuries to be the most common, followed by blunt injuries, polytrauma, fracture, cut/open wounds, haematoma and sprain.

In our study head injury was found to be the most common associated non-orthopaedic injury comprising of 21 out of 35 cases (60%) and out of 21 head injuries cases 5 were major head injuries, 16 were minor head injuries. Eric *et al* (26) observed the most common injury sustained is head injury followed by lower (64%) and upper extremities (23%). Fitzharris *et al* (11) found fracture of upper extremity (27%) and lower extremity (24%) were the most common injuries. Out of 100 patients included in the study, 38 required surgical intervention; whereas 62 were managed conservatively as outpatients.

CONCLUSIONS

Multiple logistic regressions were used to find the association of the factors with road traffic accidents. Most common age were younger adults with predominance of male population. Majority of the accidents took place in daytime (37%), evening (31%) was the second most common time of accidents. Accidents on Local Pakka road and State highways accounted for 49% and 45% of all accident victims. Drivers were the commonest victims (75%) while 25% were sitting on back seat. The proportion of victims recorded under the influence of alcohol was 41%. Helmet was not worn in almost all (99%) of cases. Sixty two percent of patients were managed conservatively at OPD or casualty and 38% required surgical intervention. To conclude the common problems associated with the two-wheeler accidents were conditions of roads, alcohol influence on driver and condition of the vehicle.

Road traffic accidents continue to be a social threat, incurring heavy loss of valuable human resource. The segregation of different types of road users is a key step. Encouraging safe behavior is important along with enforcement of road safety regulations.

Conflict of Interest: None

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