



Epidemiology of Orthopaedic Injuries in Cases of Road Traffic Accidents

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Background: Road traffic accidents are on the rise due to rapid urbanization, motorization, lack of appropriate road engineering, poor awareness levels, non existent injury prevention programs, and poor enforcement of traffic laws. From mild to severe injuries, a road traffic accident can have a significant social and economic impact on the individual, family and the society. It is believed that the outcome of this study should help in identifying risk factors, set priorities for prevention and aid in management of cases.

Materials and Methods: This study is a cross sectional prospective study conducted over a period of 6 months

Results: One hundred and twenty seven RTA victims were studied during the period. The most commonly affected age group was 21-40 years. Men were more involved in RTAs than women. Most common fracture was tibial fracture and most common fractures were seen in people who drove motorcycles. Accidents were most commonly seen during the time period of 6pm to 6am.

Conclusion: Computerised trauma registry is needed urgently to highlight risk factors, circumstances, chain of events leading to accidents.

Strict licensure procedure should be followed and minimum level of education should be imparted especially to younger age groups. Doing so will be helpful in policy making and health management in India.

Keywords: Orthopaedic fractures; road traffic accidents; trauma.

1. INTRODUCTION

Road traffic accidents are any injury due to crashes originating from, terminating with or involving a vehicle partially or fully on a public road due to human, technical, and environmental contributing factors [1].

The Global status report on road safety 2013 indicates that the worldwide total of road traffic deaths remain high at 1.24 million per year. Road traffic injuries are the leading cause of death among young people, aged 15–29 years [2]. Data showed that more than 1.3 lakh people died on Indian roads, giving India the dubious honour of topping the global list of fatalities from road crashes. Rapid urbanization, motorization, lack of appropriate road engineering, poor awareness levels, non-existent injury prevention programmes, and poor enforcement of traffic laws has exacerbated the situation.^[1] From mild to severe injuries, a road traffic accident can have a significant social and economic impact on the individual, family and the society. The impact of these injuries remains poorly measured in India [3].

The aim of this study is to determine circumstances, human and road traffic variables that influence severely and mildly injured urban road traffic users. It is believed that the outcome of this study will help in identifying risk factors set priorities for prevention and aid in management of cases.

2. MATERIALS AND METHODS

A prospective study was Conducted in the Emergency and Orthopaedic Department of Saveetha Medical College, a tertiary level health care between January 2021 and June 2021. The study was approved by the Institutional Medical Ethics Committee. The institute is located on Poonamalle highway. In addition to a well-equipped emergency department with prompt ambulatory services. Its vicinity to the Highway, makes it one of the nearest emergency care providers to the victims of road traffic mishaps from the surrounding areas.

127 cases of road traffic accidents that presented to the hospital during January 2021 to June 2021. Relevant clinical information including age and gender of patients were obtained and presented in frequencies and percentage frequencies using Microsoft Excel 2006. Inclusion was irrespective of the age, gender, ethnicity and severity, location or mode of injury. Reports where age or gender of patients was not stated, or where original x-ray request forms could not be retrieved, were excluded from this study.

3. RESULTS

One hundred and twenty seven bone fracture cases were reviewed, and the fractures were observed to have occurred more in males than in females [Chart 1], and in the age group of (21-40) [Chart 2].

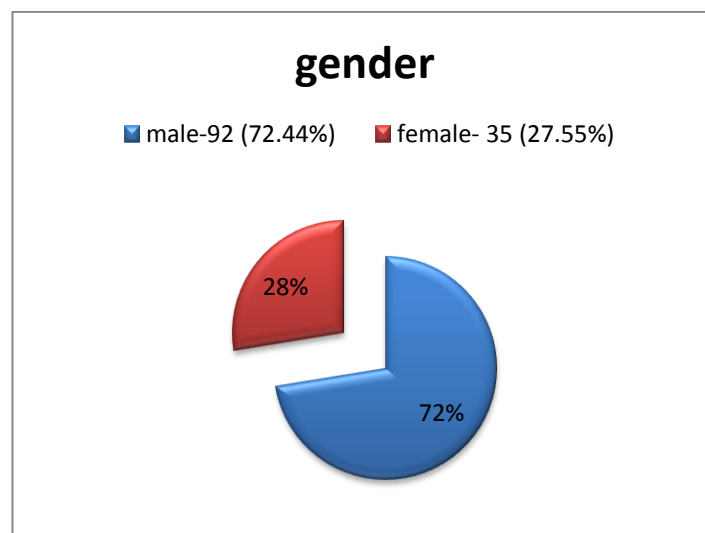


Chart 1. Gender

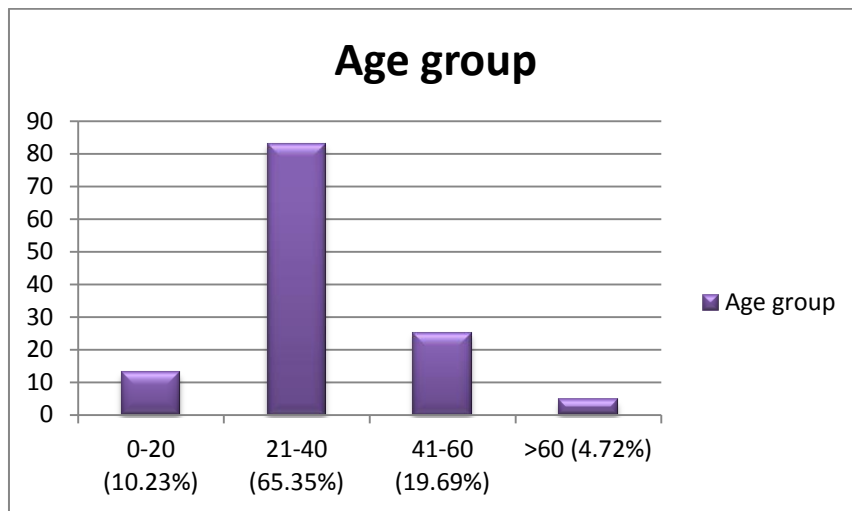


Chart 2. Age Group

Table 1. Bones involved in fracture

Bones	Frequency	Percentage
Skull	5	3.93
Clavicle	9	7.08
Humerus	12	9.44
Radius	3	2.36
Ulnar	2	1.57
Radius – Ulnar	5	3.93
Phalanges	1	0.79
Femur	27	21.25
Tibia	35	27.56
Fibula	3	2.36
Tibia-Fibula	18	14.18
Foot	2	1.57
Pelvis	3	2.36
Rib	2	1.57
Total	127	100



Image 1 and 2. X-rays of most common fracture- proximal tibial fracture



Image 3. X-ray of least common- 2nd proximal phalynx fracture

Table 2. Accident characteristics

	Frequency	Percentage
Pedestrians	6	4.72
Bicycle	7	5.51
Motorcycle	74	58.27
Car occupants	23	18.11
Other	17	13.39
Total	127	100

Table 3. Helmet wearers

Helmet wearers	19
Non helmet wearers	62
Total (bicycle and motorcyclists)	81

Table 4. Type of accidents

	Frequency	Percentage
Head on	14	11.02
Sideways	91	71.65
Other	22	17.32

Table 5. Time of accident

Time	Frequency	Percentage
6am- 6pm	59	46.56
6pm- 6am	68	53.54

Majority of the fractures overall were observed in the tibia. As seen in Table 1, fractures were most common in the lower limb with the tibial fracture being the most fracture accounting for 35 (21.25%) followed by the femur 27 (14.18%). The most fractured bone in the upper extremity was

the humerus 12 (9.44%) followed by the clavicle with 9 (7.08%) of the fractures. Skull fractures accounted for 5 (3.93%). The least fractured bone was the phalanges with a single case recorded, accounting for (0.79%) of the total fractures studied.

Most common fractures were seen in people who drove motorcycles (58.27%) followed by car occupants (18.11%). Least common was pedestrians (4.52%) and on bicycles (5.51%).

4. DISCUSSION

During this study period of 6 months, 127 cases of road traffic accidents that were presented at our emergency department was studied.

The study showed majority of accidents involved males (72.44%). This is seen to be in accordance with other studies [4-5]. This gender bias could be due to the fact that more males work outdoors and therefore are more commonly exposed to traffic accidents. Many of them were likely to have been the sole bread winner of their families, which causes an adverse economic impact on the family. Accidents were most commonly seen in the age group 21-40. This is seen in similar studies [6] and is probably due to risk taking behavior in young people. The most common fracture was observed to occur more in the lower extremities, with the tibia being the most fractured bone. This was not similar to findings by several authors [7-12], where femur was found to be the most common fracture in lower limbs. In the index study, the most fractured bone in the upper extremity was the humerus. This was similar to a study in Ethiopia in which the humerus was found to be the most fractured bone in the upper extremity [13]. The upper limbs are essential for mobility and control especially with the use of motorcycles which are a common mode of transportation in this study. Most common fractures were also seen in motorcyclists, this was not in accordance with study by Hongwei Wang et al [14], where car occupants were most commonly involved in accidents. This is probably due to the fact that motor cycles are the most common form of transport seen in this region of study. In this study 62 people out of 81 two wheeler driver were not wearing helmets. Earlier studies have shown a significant reduction in injuries in road traffic accidents to people who were wearing helmets while driving motorcycles [15]. This calls for stricter laws and appropriate punishments for non helmet wearers.

Sideway accidents are more common than head on collision which is seen in accordance with study by Ganveer GB et al [6]. This might be the causative factor for lower limb fractures which are seen commonly. Accidents were most

commonly seen during the time period of 6pm to 6am which was seen similarly in many studies [16-18] this is because the hours correspond to the time that people go back to their homes after finishing work. An increased number of vehicles causing traffic, and reduced attention of drivers and pedestrians related to the fatigue of the day; failures to follow traffic rules, associated with improper infrastructure like the absence of footpaths were the greatest cause of accidents.

5. CONCLUSION

The results of the study will help predict the pattern of RTA injuries with the help of Computerised trauma registry to highlight risk factors, circumstances, chain of events leading to accidents and may subsequently help reduce mortalities by adequate and prompt management of patients. It will also help policy makers in implementing effective emergency services. Proper education on road safety should be imparted from school level. Traffic congestion should be reduced with the help of traffic police.

CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

We conducted our research after obtaining proper IEC approval.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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