

A STUDY ON PATTERN OF INJURIES FOLLOWING RTA

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ABSTRACT

BACKGROUND

Around three lakh accidents occur in India every year injuring upto 3,40,000 people. Injuries to the pedestrian occur as a result of acceleration process. There can be an abrasion, contusion, laceration or fracture. Injuries can be grouped as

- **Primary Impact Injuries:** This is the first contact of vehicle over the victim's body. It can be an abrasion or contusion and may bear the design of the part of vehicle which struck the victim. The part of the body involved depends upon the position of the victim or the dimension of the offending vehicle.
- **Secondary Impact Injuries:** Following the primary impact the victim can be scooped up and the vehicle can impact over other parts of his body producing injuries.
- **Secondary Injuries:** These occur when the victim is knocked down following impact. These injuries are as a result of the victim striking the ground or any other intervening object.
- **Crush Injuries:** these are seen when the victim is run over by the vehicle. The severity depends upon the weight of the vehicle.²

In this study a sincere effort has been put to study the different types of injuries produced in a victim of road traffic accident. This study is intended to help the fellow orthopaedicians to identify quickly and act accordingly and thus prevent the consequences.

MATERIALS AND METHODS

- The present study was done in the Department of Orthopaedics, Travancore Medical College at Kollam.
- The present study was done from March 2015 to march 2016.
- A total of 196 cases of RTA were admitted in our hospital during the study period.
- Gender distribution, age distribution, type of road user, time of the day when accidents occurred, part of the body injured, types of fracture and injuries sustained that followed was checked.
- Detailed clinical history and examination was done and simultaneously noted.

INCLUSION CRITERIA

Nonfatal injuries was taken up for the study.

EXCLUSION CRITERIA

Patients who succumbed to the injury was not reported.

RESULTS

In the present study one fifty two patients were male and forty four patients were female. The males accounted for seventy eight percent and females accounted for twenty two percent. Out of the total one hundred ninety six patients, eight six patients belonged to the age group of twenty to forty years which amounted to 43.87 percent which was recorded highest. Based on the type of road users the two wheeler riders amounted to seventy two admissions. Only four admissions were seen of injuries which were related to pedal cyclists. Based on the accidents according to time of the day forty one percent (81) cases occurred between 12 AM and 6 AM. This time period is the most dangerous as the drivers usually tends to fall asleep while driving. Parts of the body injured the extremities both upper and lower limb suffered maximum number. They amounted to one hundred fifty two cases.

Depending upon the type of injuries sustained on the patient's body abrasions were seen in one thirty two cases which was the highest. The fractures which were seen the body of the victims occurred in highest frequency in the upper extremities which amounted to twenty six in number followed by thorax which amounted to twenty three in number followed by skull/face which amounted to twenty two in number followed by lower extremities which amounted to eighteen in number. The spinal fractures were seen in four cases and pelvic fractures were seen in two cases. Twenty seven cases admitted had consumed alcohol and this had strong association with the RTA.

CONCLUSION

This study shows that two wheeler riders and pedestrians amounted to maximum number of injuries suffered. Proper implementation of traffic rules and abiding those rules from the general public is the need of the hour. Driving and travelling at night should be avoided as far as possible. Age group between twenty years and forty years had the highest number of casualties because that age group people usually ventures out on purpose of work.

KEYWORDS

Road traffic accident, Injuries, Fractures, Skull, Ribs.

HOW TO CITE THIS ARTICLE: George J, Vinod VS, Kumar A, et al. A study on pattern of injuries following RTA. J. Evid. Based Med. Healthc. 2016; 3(78), 4226-4229. DOI: 10.18410/jebmh/2016/900

*Financial or Other, Competing Interest: None.
Submission 18-08-2016, Peer Review 29-08-2016,
Acceptance 20-09-2016, Published 27-09-2016.*

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DOI: 10.18410/jebmh/2016/900



INTRODUCTION: Injury has been a problem to mankind since time immemorial. Majority of patients presenting to the emergency department with injuries are victims of road traffic accidents. The incidence of road traffic accidents is on the rise in India. The probable causes can be poor roadways, disregard to safety, drunken driving or non - use of helmets and seatbelts.

The type of trauma causing injuries in a RTA is blunt force. The injuries caused by blunt force are abrasion, contusion, laceration and fracture.

In an abrasion only superficial layers of skin are involved. Different type of abrasion depending upon the offending agent and its movement against the skin are;

- Linear abrasion caused by pointed end of the offending agent.
- Grazed abrasion caused by tangential contact with a rough hard surface. Eg. Tar road.
- Patterned abrasion caused by a force applied at right angle to the skin. The pattern of the offending surface is left on the skin.

Contusion results from extravasation of blood from injured vessels into subcutaneous tissues. Usually it is produced immediately. Sometimes if the bruise is deep it may take a long time to become externally visible. It is called as delayed bruising. In some cases the bruising may appear away from the site of impact, it is called migratory or ectopic bruising.

Laceration is tear in skin, mucous membrane, muscle or any internal organ.

Fracture is break in the continuity of the bone. A normal bone can withstand certain amount of force beyond which it fractures. A fracture can be displaced or undisplaced. Based on the relationship of the fractured bone with the external environment, it can be closed fracture or open fracture.

The extent of injuries suffered is directly proportional to degree of acceleration or deceleration the victim is subjected to. The tissue damage will depend upon force exerted per unit area. In a road traffic accident the victim can either be an occupant of the vehicle or a pedestrian. The key factors related to injury in the victim are the mass and speed of the vehicle on impact, occupants restrained or unrestrained, occupant ejected, interaction of victim with vehicle parts.¹

In case of motor cars, injuries may vary based on the position of the occupant.

The driver may suffer the following injuries,

- **Head Neck and Face:** abrasions, contusions, lacerations, fracture of skull and intracranial haemorrhages, whiplash injury to cervical spine, fracture dislocation of cervical spine.
- Abrasion, laceration and fractures of legs around knee or upper shin level.
- Dislocation of hip joint and fracture of pelvis.
- Impact of steering wheel to chest and abdomen leading to fracture of ribs, sternum, haemothorax, pneumothorax and laceration/contusion of internal organs like liver, lungs and spleen.

The front seat occupants suffer collision with windscreen as there is no steering wheel to impact their chest and abdomen. Usually the occupants are not as alert as the driver and fail to brace any nearby structure and they may suffer more injuries.

The rear seat occupants are thrown to the front or may get thrown out of the vehicle through windscreen. In rollover accidents the occupants suffer multiple injuries as they get hit by various structures.

The motor cyclists are much more prone to severe injuries because the two wheelers are unstable and are generally driven by younger age group who can be rash and adventurous. Commonly both extremities are involved although any part of body can be involved. Abrasions, contusions, lacerations and fractures are common. Fracture of skull, cervical spine and intracranial haemorrhages can also be seen if the rider falls on the ground and hits the head.

Injuries to the pedestrian occur as a result of acceleration process. There can be an abrasion, contusion, laceration or fracture. Injuries can be grouped as;

- **Primary Impact Injuries:** This is the first contact of vehicle over the victim's body. It can be an abrasion or contusion and may bear the design of the part of vehicle which struck the victim. The part of the body involved depends upon the position of the victim or the dimension of the offending vehicle.
- **Secondary Impact Injuries:** Following the primary impact the victim can be scooped up and the vehicle can impact over other parts of his body producing injuries.
- **Secondary Injuries:** These occur when the victim is knocked down following impact. These injuries are as a result of the victim striking the ground or any other intervening object.
- **Crush Injuries:** these are seen when the victim is run over by the vehicle. The severity depends upon the weight of the vehicle.²
- In this study a sincere effort has been put to study the different types of injuries produced in a victim of road traffic accident. This study is intended to help the fellow orthopaedicians to identify quickly and act accordingly and thus prevent the consequences.

AIMS AND OBJECTIVES: To study and understand the pattern of injury in RTA.

MATERIALS AND METHODS: The present study was done in the Department of Orthopaedics, Travancore Medical College at Kollam.

The present study was done from March 2015 to march 2016.

A total of 196 cases of RTA were admitted in our hospital during the study period.

Gender distribution, age distribution, type of road user, time of the day when accidents occurred, part of the body injured, types of fracture and injuries sustained that followed was checked.

Detailed clinical history and examination was done and simultaneously noted.

Inclusion Criteria: Nonfatal injuries was taken up for the study.

Exclusion Criteria: Patients who succumbed to the injury was not reported.

All the data was statistically analysed using latest SPSS (2015). California.

RESULTS:

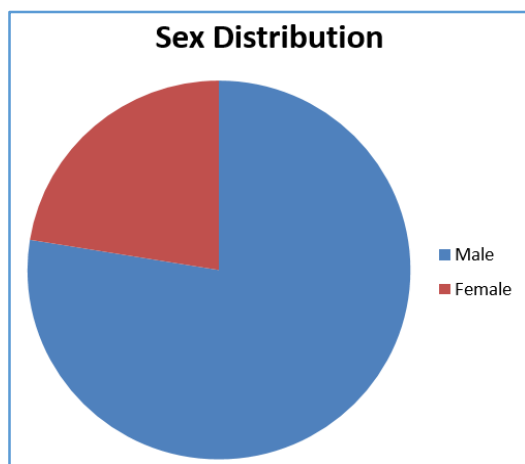


Image 1: Gender distribution

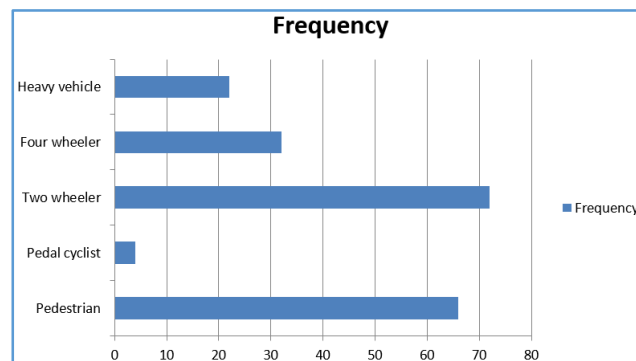


Image 3: Type of road users

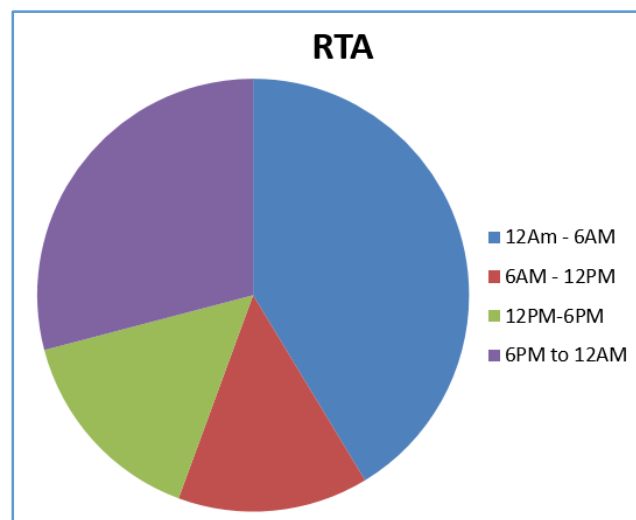


Image 4: Distribution of accidents according to time of day

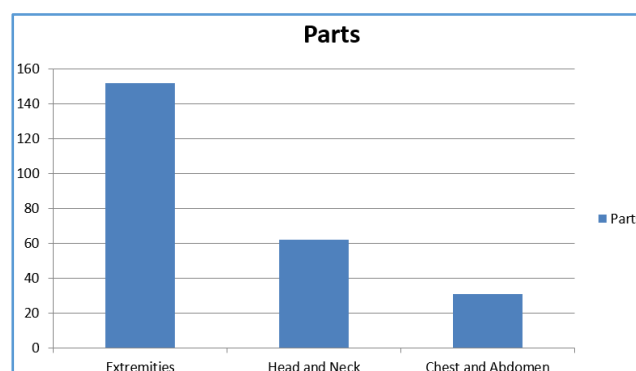


Image 5: Part of the Body Injured

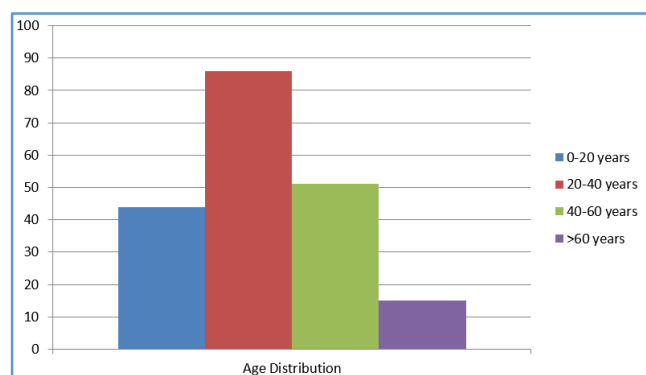


Image 2: Age Distribution

| Type of Injuries | Frequency |
|-----------------------|-----------|
| Abrasion | 132 |
| Contusion | 103 |
| Laceration | 92 |
| Fracture/Dislocation | 67 |
| Internal organ injury | 13 |

Table 1: Injuries sustained

| Part of the Body | Frequency |
|------------------|-----------|
| Upper Extremity | 26 |
| Lower Extremity | 18 |
| Skull/Face | 22 |
| Spine | 04 |
| Thorax | 23 |
| Pelvis | 02 |

Table 2: Showing distribution of fracture

| Alcohol | Positive | Negative | X ² value | p value |
|---------|----------|----------|----------------------|---------|
| | 27 | 169 | 8.920 | 0.030 |

Table 3: Showing Association of Alcohol Consumption with RTA

DISCUSSION: In the present study one fifty two patients were male and forty four patients were female. The males accounted for seventy eight percent and females accounted for twenty two percent. Out of the total one hundred ninety six patients, eight six patients belonged to the age group of twenty to forty years which amounted to 43.87 percent. Aged group between forty to sixty years amounted to fifty one admissions, age group twenty to forty years had forty four admissions and the least number of admissions in this present study was seen in the age group of more than sixty years which amounted to fifteen admissions.

Based on the type of road users the two wheeler riders amounted to seventy two admissions followed by the injured pedestrians which were sixty six in number. The four wheeler occupants amounted to thirty two admissions, heavy vehicle users amounted to twenty two admissions and only four admissions were seen of injuries which were related to pedal cyclists.

Based on the accidents according to time of the day forty one percent (81) cases occurred between 12 AM and 6 AM. This time period is the most dangerous as the drivers usually tends to fall asleep while driving. Twenty nine percent of the total were seen between 6 PM to 12 AM followed by fifteen percent of cases (30) were seen at 12 PM to PM time and fourteen percent of cases (28) were seen between 6 AM to 12 PM.

Parts of the body injured the extremities both upper and lower limb suffered maximum number. They amounted to one hundred fifty two followed by injuries suffered to head and neck which are sixty two in number. The least number of injuries were seen in chest and abdomen that amounted to thirty one injuries.

Depending upon the type of injuries sustained on the patient's body abrasions were seen in one thirty two cases, followed by contusions in one hundred and three cases, lacerations were seen in ninety two cases, fracture/dislocation were seen in sixty seven cases. The internal organ injury was least in number which accounted to thirteen cases.

The fractures which were seen the body of the victims occurred in highest frequency in the upper extremities which amounted to twenty six in number followed by thorax which

amounted to twenty three in number followed by skull/face which amounted to twenty two in number followed by lower extremities which amounted to eighteen in number. The spinal fractures were seen in four cases and pelvic fractures were seen in two cases.

Twenty seven cases admitted had consumed alcohol and this had strong association with the RTA.

In the present study 13.77 percent had consumed alcohol. This is a higher proportion than 4.6% and 8%, reported by others from Delhi.^[3,4] But in other case study conducted by Nilambar Jha et al^[5] they had reported fifteen percent of the cases had taken alcohol. In other studies^[6,7,8] pedestrians were mostly injured but in our state they were less in number. This may be due to the fact that more and more people take advantage of the public transport system.

CONCLUSION: This study shows that two wheeler riders and pedestrians amounted to maximum number of injuries suffered. Proper implementation of traffic rules and abiding those rules from the general public is the need of the hour. Driving and travelling at night should be avoided as far as possible. Age group between twenty years and forty years had the highest number of casualties because that age group people usually ventures out on purpose of work. Males suffered maximum number of injuries for the reason that in a conservative country like ours it is usually the male population who venture out for the work purposes.

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