



A Cross-Sectional Study for the Analysis of Commonly Attained Fractures in Patients Admitted Followed by a Motorcycle Accident

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ABSTRACT

Introduction: Road traffic accidents (RTA) are more common in developing countries due to a lack of resources to meet the societal challenges, economic challenges and health care services. Individuals responsible for such accidents are vulnerable users of roads, pedestrians and motorcyclists. The injuries attained by the RTAs considerably contribute to the burden of mortality on a global level. Studies show this pattern is seen more significantly in developing countries. Out of all kinds of accidents that happen on the road, the most dangerous and traumatic ones are associated with motorbikes. They are a serious reason for morbidity and mortality in the productive age, especially in the male gender.

Aim: To determine the frequency of various fractures commonly attained during the motorcycle accidents.

Methodology: The study included 140 participants presenting in the orthopedic unit with a history of motorbike accidents. A brief history of the patients was noted on an individual proforma. The examination was done for making a provisional diagnosis. All the patients were advised X-ray of the region where the fracture was expected.

Results: The mean age of the patients was 32 ± 7.94 years. Out of 140 participants, 116 (82.86%) were male and 24 (17.15%) were females. A total of 41 (29.29%) were detected with fracture of the femur, 78 (55.71%) were detected with a fracture in the tibia, 11 (7.86%) had fractures in the humerus, and the remaining 10 (7.14%) were determined with fractures in radius and ulna.

Conclusion: The highest percentage of fractures in a motorbike accident was determined in the bones of the leg. The commonest fractured bone was the tibia followed by femur. Arm and forearm bones had a lesser percentage of fracture compared to leg bones. However, these fractures can be prevented by following the rules and regulations of traffic as well as through preventive campaigns.

Key Words: Motorbike accidents, Fractures, Femur, Tibia, Humerus, Radius and ulna

INTRODUCTION

Road traffic accidents (RTA) are more common in developing countries due to a lack of resources to meet the societal challenges, economic challenges and health care services. Individuals responsible for such accidents are vulnerable users of roads, pedestrians and motorcyclists.¹ The injuries attained by the RTAs considerably contribute to the burden of mortality on a global level. Studies show this pattern is seen more significantly in developing countries.² Out of all kinds

of accidents that happen on the road, the most dangerous and traumatic ones are associated with motorbikes. They are a serious reason for morbidity and mortality in the productive age, especially in the male gender.³

There are certain preventive measures followed globally for the prevention of serious RTAs. Some of them are related to rules and regulations of traffic. Others are related to the health services and availability of first aid for the affected individuals. If those preventive measures are ignored, serious injuries and even death can be expected.⁴ Road traffic

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injuries were considered as one of the leading causes of permanent disability and mortality in individuals of productive age even in the developed countries where the ratio of such injuries is comparatively lower.⁵ The risk of such injuries is more in individuals of lower socioeconomic status. They are also exposed to death from traffic crashes.⁶ Accidents of motorbikes are a common cause of severe traumatic brain injuries. This is the worst scenario in a developing country such as Pakistan.⁷

It has been seen that the lower limb and head are the most common regions to be affected in a motorbike accident. They contribute 30 to 80% of all the injuries of motorbike accidents.⁸ There are certain ways that these accidents can be prevented on a gross level such as introducing traffic safety programs, involvement of citizens in safety campaigns, educating people on all levels about the regulations of traffic and educating the community about the importance of traffic rules.⁹

The present study aims at the determination of common fractures attained by a person who underwent a motorbike accident.

Study design: A cross-sectional study

Place and Duration: This study was conducted at THQ Hospital Jati, Sujawal Pakistan from June 2020 to June 2021.

METHODOLOGY

The present study is a cross-sectional study. The study includes 140 participants and was conducted in our hospital. Permission was taken from the ethical review committee of the institute. All the participants were admitted to the department through the emergency room. Referred patients from other cities and provinces were also admitted. All the participants included in the study had attained a fracture through a motorbike accident. The fractures were assessed and classified in the category of closed and open fractures. Gustilo and Anderson's classification was used for classifying the open fractures. According to the considered exclusion criteria, those patients that had attained only soft-tissue injuries, thoracoabdominal injuries, other systemic injuries, and vascular injuries, were not included in the present study.

An exceedingly long prop was placed on the patients for 2 weeks postoperatively. The mobility of the knee was started on the third day as per the threshold of the patient. Various movements were given and isometric quad activities were encouraged. Patients were made to do non-weight bearing prop strolling for 12-weeks. During the radiological mending of the fracture, the full-weight

bearing was also said permissible. For the observation of fracture recuperation, patients were asked for a follow-up visit after 6 weeks. After that, follow-up visits were set every 3 months for the next 1 year. After 1 year, they were advised to visit on annual basis for 2 more years. All the cases were monitored clinically and radiologically for 24 months. All the data was recorded and analyzed in SPSS version 26.

RESULTS

A total of 140 participants were included in the study. The participants were injured in the last 24 hours of presentation to the hospital. The mean age of the patients was 32 ± 7.94 years. The distribution of the ages of the patients has been shown in Figure 1.

Out of the total of 140 patients, 116 (82.86%) were male and 24 (17.15%) were females. A total of 25 (17.86%) did not possess a driving license. The distribution of gender has been shown in Figure 2. The distribution of the fractures was such that the commonest fractured bone was the tibia. A total of 78 (55.71%) patients had attained a fracture in the tibia. After that, 41 (29.29%) were detected with a fracture of the femur. A total of 11 (7.86%) had fractures in the humerus and the remaining 10 (7.14%) were determined with fractures in radius and ulna. The distribution of fractures has been shown in Figure 3.

The technique of stratification was used for the observation of the significance of the type of fracture with different variables by the application of the Chi-square test. It was significant with age as shown in Table 1. The fractures were not significantly associated with gender, possession of a license, duration of injury, hypertension, and diabetes mellitus. They were significantly associated with education giving a p-value of 0.0001.

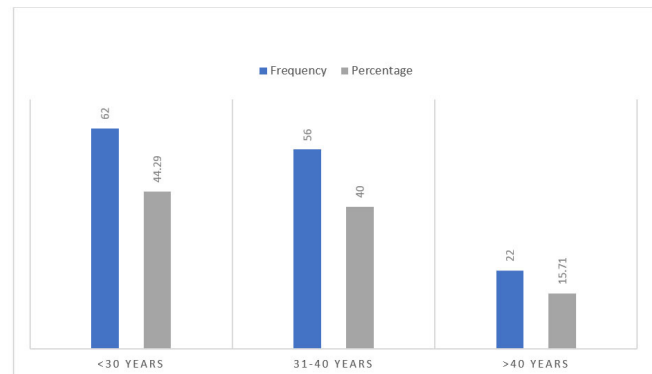


Figure 1: Age distribution.

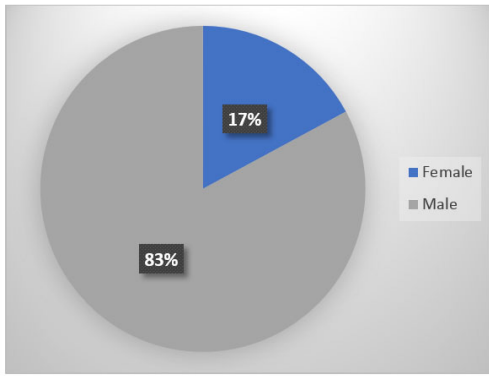


Figure 2: Distribution of genders.

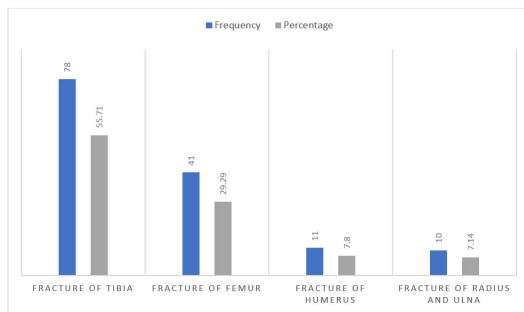


Figure 3: Distribution of fractures.

Table 1: Distribution of fractures according to the ages of the participants

Type of fractures	<30 years n=62	30-40 years n=56	>40 years n=22	p-value
Fracture of tibia	30	35	13	0.0135
Fracture of femur	17	17	7	
Fracture of humerus	8	2	1	
Fracture of radius-ulna	7	2	1	

DISCUSSION

According to the survey of injuries, one of the major issues in Pakistan regarding injuries can be seen that the incidence of injuries is 41/1000.¹⁰ RTAs are the second most common reason for the deaths in young people of age 5 years to 29 years. It is the third most common cause of death in people of age 30 to 44 years.¹¹ The common age of patients that attain fracture during an RTA is 32 years. Most of the cases in the present study had an age of 21 to 30 years. According to the study of Khan et al., patients of RTAs needed orthopedic treatment due to trauma, were mostly between the ages of 16 to 44 years.¹²

According to the study of Yousaf et al., 85.6% of the par-

ticipants in his study with a motorbike accident were male. This percentage is close to that of the percentage seen in the present study. The most commonly fractured bones seen in their study were the tibia and fibula. These findings are also consistent with the findings of the present study. They also concluded that prevention programs should be introduced in society for avoiding such dangerous accidents.¹³ The most common cause of accidental injuries in the riders of motorbikes is not wearing a helmet, other protective gear, and violation of rules. The second most common victims after the rider are the passengers and the third most common is pedestrians.¹⁴

The pattern of fractures seen in motorbike accident victims is such that the bones of the lower limb are most affected followed by the bones of the upper limb. The reason behind this pattern is the direct transfer of energy from the motorbike to the passenger during a collision. The study of Chalya et al. suggests that the right side of the body of the victim is most likely to be affected compared to the left side. The majority of the open fractures are seen in the tibia. The result of their study is comparable to the result of the present study.¹⁵ The morbidity of the trauma can be judged by the length of stay at the hospital. Prolonged hospital stay also affects the resources of the hospital as well as the productivity of the individual due to long stays.¹⁶

A large population of motorbike riders in Pakistan is male. Motorbikes are used for business purposes. Most of the riders ride recklessly and do not care about helmets most of the time.¹³ According to the study of Kudebong et al., most of the fatalities during a motorbike accident are seen in young riders between the age of 20 and 39 years.¹⁷ These results are comparable with the results of the present study. The age group in the present study is similar to the study of Kudebong et al. A similar study conducted by Khani et al. about the common fractures attained during a motorbike injury suggests that 55.83% of their participants had a fracture of leg bones. About 28.33% had got a fracture of the femur and almost 16% attained fractures in the upper limb.¹⁸

CONCLUSION

The results of the present study suggest that the most fractured bone during a motorbike accident is the tibia. The femur is the second most commonly fractured bone. The bones of the upper limb have a lesser percentage of fracture. Mostly, the male gender is involved in such kinds of injuries acquired from motorbike injury. These accidents can be prevented by academic campaigns aimed at educating the masses about the rules and regulations of traffic as well as their significance.

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Conflict of interest

The present study did not have any kind of conflicts of interest

Permission

Permission was asked and taken from the ethical committee of the institute

Authors' Contribution: All authors contributed equally towards the data collection, data analysis & compilations

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