Severity and Pattern of Bony Injuries among the Victims of Motorbike Accidents presented to the Accident and Emergency Department of a Tertiary Care Hospital in Karachi.

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ABSTRACT

Objective: To determine the severity and pattern of bony injuries among the victims of motor bike motorbike accidents presented to the Accident and Emergency Department of Dr. Ruth K.M Pfau Civil Hospital Karachi.

Methods: This descriptive study was conducted in Dr. Ruth K.M Pfau Civil Hospital Karachi from 12th January 2019 to 12th January 2020. All adult patients of motorbike accidents with extremity fractures fulfilling the inclusion criteria were included in this study. In the included subjects the locations of fracture or dislocation and whether closed or open were noted.

Results: The total number of patients were 380 with mean age of 28.67 ± 12.07 years. Lower extremity fractures were noted in 273(71.8%) patients and upper extremity in 107(28.1%) patients. Tibia fibula was the commonest lower limb fracture documented in 157(41.3%) patients while radius was the commonly fractured upper limb bone in 46(12.1%) patients. Majority (75.2%, n=286) of the fractures were closed while open fractures were seen in 94(24.7%) patients.

Conclusion: Victims of motorbike accidents sustained variable bony injuries. Majority of these fractures were closed. Tibia fibula was the commonest bone fractured.

Kew words: Accident, Bone, Fracture, Injury, Motorbike, Pattern.

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INTRODUCTION

Injuries caused by motorbike accidents constitute serious traffic accidents resulting in significantly increased morbidity and mortality, especially among the teenagers and young male adults.[1,2] In 2013 overall 1130 traffic related fatalities were recorded in the city of Karachi with over half of these fatalities (51.1%,n=577) involved motorbikes.[2] Victims of motorbike riders have the highest public health burden in terms of healthcare expenditure and disability resulting in decrease nation's workforce.[3] Currently many developing countries including Pakistan are facing the burden of a rapidly increasing motorbike related fatalities and disabilities. Due to its serious nature, head injury was the main focus of attention in majority of research studies and extremity trauma resulting in substantial number of injuries and disabilities is still a hidden catastrophe.[1, 4]

According to the Karachi Transportation Authority the number of motorbikes on road estimated to reach 3.8 million by 2030 and more morbidities and mortalities due to accidents are expected.[5] Majority of Karachi population is lower middle class and depends on motorbike as a means of transportation usually carrying more than its capacity and more prone to accidents and injuries.[6] It is also alarming that most of the motorbike riders are under age without license to drive and do not abide by the traffic and safety rules. Many national and international studies documented lower limb fractures with variable severity in majority of motorbike victims.[1,7]

The objective of our study was to determine the severity and pattern of bony injuries among the

victims of motor bike accidents presented to the Accident and Emergency Department of Dr. Ruth K.M Pfau Civil Hospital Karachi, The results of our study will be utilized in formulating preventive and treatment strategy for motorbike victims focusing on allocation of resources and equipment to the Accident and Emergency Department to ensure prompt and optimum treatment.

METHODS

This descriptive study was conducted in Dr. Ruth Pfau Civil Hospital Karachi after approval and permission from Institutional Review Board (**IRB**) of the Dow University of Health Sciences Karachi. The duration of our study extended from 12th January 2019 to 12th January 2020.Our sample size was 380 calculated with WHO sample size calculator by considering 25.56% of motorbike victims sustained bony limb injuries[5], with 5% precision and 95% confidence interval. All adult motorbike riders with nonfatal limb fractures who were admitted in Orthopaedic unit were included. Motorbike riders with compartment syndrome, crushed limb and those who sustained head, spine, chest and abdominal injuries requiring multidisciplinary intervention in the hospital were excluded. Informed written consent was taken from all participants. All patients were resuscitated as per ATLS protocol. Limb was splinted and radiographs advised. In the included subjects complete history and physical examination was done and all demographic and clinical features were recorded in a predesigned proforma. The location of fracture and whether closed or open (as per Gustilo-Anderson classification)[8] was noted.

The data was analysed using SPSS software version 22.0 (IBM Corp., Armonk, NY, USA). Continuous variables were analyzed using descriptive statistics (mean ± standard deviation) and discrete variables were analyzed using frequencies and percentages. Data was presented in table where necessary.

RESULTS

We included 380 victims of motorbike accident. The mean age was 28.67 ± 12.07 years. The demographic and fracture dislocation distribution is shown in table I. Most (38.4%,n=146) of the motorbike sustained injuries due to slippage of motorbike. Majority(71.8% n=273) of the motorbike riders had lower limb fractures while upper limb fractures were noted in 107(28.1%).Tibia fibula fractures were present in 157(41.3%) while radius fracture was noted in 46(12.1%) patients. Closed fractures were present in 286(75.2%) and open in 94(24.7%). Gustilo Anderson type II fractures were noted in 65(17.1%), type III in 18(4.7%) and type I in 11(2.8%) patients. Majority (63.5%, n=230) of the fractures were on right side while 132(36.4%) fractures were on left side. Dislocations were documented in 9(2.3%) patients.

Table I: Demographic and facture dislocation distribution of our study participants.

Demographic/clinical characteristic	**Frequency/ Percentage**
Gender	
Male	380 (100%)
Female	0 (0%)
Helmet use	
Yes	55(14.5%)
No	325 (85.5%)
Legal traffic license	
Yes	118(31.1%)
No	262(68.9%)
Aetiology of injury	
Motorbike slip	146(38.4%)
Motorbike collision with car	86(22.6%)
Motorbike collision with motorbike	80(21.1%)
Others	68(17.9%)
Distribution of fractures	
Lower limb	**273 (71.8%)**
Tibia/fibula	156(41.3%)
Femur	110(29.2%)
Ankle-foot	25(6.6%)
Pelvis	18(4.9%)
Upper limb	**87 (22.9%)**
Radius	45(12.1%)
Humerus	28(7.6%)
Clavicle	25(6.8%)
Ulna	11(2.9%)
hand	4(1.3%)
Both upper and lower limb	20 (5.3%)
Dislocation of joints	**9 (2.36%)**
Interphalangeal joint	4(1.3%)
Elbow joint	3(0.7%)
Shoulder joint	2(0.52%)

DISCUSSION

In our study majority (71.8% n=273) of the motorbike riders had lower limb fractures while upper limb fractures were noted in 107(28.1%) motor bike victims. Similar to our study Khan[9] reported lower limb fractures in 450(22.5%) and upper limb in 272(13.6%) motorbike victims in his study. We had noted that tibia fibula fractures were the predominant fractures (41.3%,n=157) of the lower limb while radius fracture(12.1%,n=46) of the upper limb. Khani GMK[5] noted that tibia was the

commonest bone fractured in 165(48.5%) motorbike victims. Oluwadiya KS[10] and colleagues reported that tibia was the commonest bone fracture in 32(27.8%) in his study. A review of 1003 motorbike accidents by Yousaf and colleagues[6] revealed tibia fibula fracture in 43.4% of their study participant. Aslam and Taj[1] documented that lower limb fractures were the most common fractures noted in 230(66%) motorbike accidents. Tibia fracture was the commonest (39%, n=137) among lower limb fractures while radius was the commonest (9.1%,n=32) among upper limb fractures. Latif[11] was of the opinion that riding a motorcycle is a lower limb hazard. He noted tibia fracture in 231(43.5%) followed by ankle fractures in 186(35%).Hasan[12] reviewed the record of 355 motorbike accidents and documented lower limb fractures in 122(34.3%) and upper limb in 102(28.7%). Tibia was the commonest lower limb bone fracture in 41(33.6%) and radius in upper limb in 25(24.5%) patients. Lakho[13] analyzed the data of 240 motor bike accidents and noted 134(55.8%) patients with tibia fractures and radius ulna in 19(7.9%) patients. Zargar and Khaji[14] collected data of1332 motorcycle accidents and noted that tibia was the commonest bone fracture in 509(49.8%) patients. In 366 motorbike victims Yaqoob *et al*[15] noted that majority fractures (86.9%, n=318) were closed while 48(13.1%) fractures were open. Tibia fibula was the predominant lower limb bone fractured in 148(40.4%) and radius ulna was fractured in 29(7.9%) patients. Barboza[16] noted lower limb fractures in 223(43.2%) and upper limb in 207(40%) motorbike victims. Banskota *et al*[17] retrospectively reviewed the record of 1337 motorbike accidents and documented that majority(61%,n=816) had lower limb fractures with predominatly tibia fractures in 353(26%) patients.

Contrary to our findings Aliciglu and colleagues[18] analyzed the data of 212 motorbike accidents and noted that musculoskeletal injuries were present in 106 patients. Tibia fibula was fractures in 38(17.9%) while the predominant injury of the upper limb was fractures of the shoulder in 24(11.3%) patients. Debieux and Chertman[19] reviewed data of 212 fractures due to motorbike accidents and found that foot fractures were the predominant fractures accounted for 34(16%) while tibia fractures accounted for 25(11.8%).

In our study open tibial fractures (Gustilo Anderson type II) were noted in 65(17.1%), type III in 18(4.7%) and type I in 11(2.8%) patients. Matos[20] analyzed the data of 81 motorbike accidents and noted 39(48.1%) fractures of tibia with 70.3% had Gustilo Anderson type III fractures.

Our study had few limitations.Our study focused on motor bike drivers only.Motorbike victioms with head injury,soft tissue injuries and visceral injuries were excluded. The mechanism of fractures and risk factors for sever injuries could not be analyzed.Further large scale studies are recommended to confirm our findings.

CONCLUSION

Victims of motorbike accidents sustained variable bony injuries. Majority of these fractures were closed. Tibia fibula was the commonest bone fractured. Motorbike accidents are an important cause of morbidity. We therefore recommend lower limb safety guards and protective foot wear so that the frequency and severity of tibia fractures could be reduced.

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