



To Assess the Frequency of Common Fractures Secondary to Motorcycle Accident in Patients Admitted to the Orthopedic Department of a Tertiary Care Hospital, Pakistan

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ABSTRACT

Objective: To assess the frequency of common fractures secondary to a bike accident in patients admitted to the orthopedic department of a tertiary care hospital, urban center. **Methods:** This cross-sectional study embrace 240 patients with the bike out of action for 6-months from September 2017 to March 2018 in Department of Orthopedic Unit I and II, Dow University of Health Sciences/Civil Hospital urban center. Temporary history concerning the time of accident and age of the patients was taken. Examination and relevant X-Rays were done. All the knowledge was noted in proforma. **Results:** The common age of the patients was 32 years (0.92 ± 7.30). There have been 200 (83.33%) male and 40 (16.67%) female. Out of 240 patients, femoris fracture was found in 68 (28.33%), leg bone fractures 134 (55.83%), there have been 19 (7.92%) arm bone fractures, and radius-ulna fractures were determined in 19 (7.92%). **Conclusion:** Majority of the accidents are preventable by an academic campaign of the general public, social control of traffic rules, provision of facilities for passengers and upgraded observance system for transportation and drivers. Preventive programs and actions should be launched by policy manufacturers of involved departments and stakeholders at the national level.

Keywords: Road traffic injuries, Fractures, Bike accident

INTRODUCTION

Road traffic injuries contribute considerably to the burden of unwellness and mortality throughout the planet, however significantly in developing countries [1-3]. Bike connected trauma is and remains a serious reason behind morbidity and mortality in those of productive age in the developing world [4]. Injuries and death from road traffic crash are expected to extend if no preventive measures are created [5]. Formally road traffic injuries were the leading reason behind permanent incapacity and mortality among those in productive age in developed countries however presently the developing countries are baby-faced by an analogous challenge because they endure what has been termed as the “epidemiology of transition” [6]. The bulk of these out of action in road traffic crashes in developing countries are pedestrians, cyclists and motorized simple machine riders [2]. Whereas the population teams exposed to the very best risks of injury and death from road traffic crashes are those from lower socio-economic groups [7,8]. Patients admitted in orthopedics ward secondary to motorcycle injuries were 340 and also the bones concerned were 380. Out of 380 bones, fracture femoris were 98 (25.8%), leg bone fractures were 165 (43.42%), there have been 10 (2.63%) arm bone fractures and radius-ulna fractures were 43 (11.31%) [9]. The explanation of the study is that bike riders have augmented enormously throughout the last decade due to road traffic accidents. Thus so as to estimate this magnitude of common fractures secondary to bike accident is critical to develop methods for resource allocation and to reduce the accident. More awareness-raising program might be initiated among bike riders concerning the importance to follow traffic rules thereby morbidity and mortality can be reduced.

MATERIALS AND METHODS

This cross-sectional study was conducted in Orthopedics Unit I and II Civil Hospital Dow University of Health and Sciences urban center from September 2017 to March 2018. This is often a tertiary care hospital having 1500 beds. The urban center may be a cosmopolitan city of 180 million folks. Subjects enclosed within the study were admitted through accident and emergency department; referrals from alternative elements of the province were conjointly admitted throughout the patient department. Victims of bike accidents with bony injuries were enclosed within the study. Approval was obtained from the moral committee of Dow University of Health Sciences. Fractures assessed intimately and classified into open and closed fractures, open fractures additional classified consistent with Gastilo and Anderson's classification patients having soft tissue injuries only, systemic injuries like head, thoracoabdominal or vascular were excluded from the study. Data management and analysis were done using SPSS version 10.0. Postoperatively patients were placed in an exceedingly long knee prop for 2-weeks. Isometric quad activities and knee vary of movement were given from the third day relying upon patient's absolute threshold. Patients did non-weight bearing prop strolling for 12-weeks with partial that time. The full-weight bearing was permissible merely during radiological mending of the fracture. Follow-up visits were done at 6-week interim till fracture recuperating was seen and later at 3-months until 1-year and at regular intervals until 2 years. These all cases were taken for a minimum of 24 months radiologically and clinically. The factual examination was performed utilizing programming SPSS version 20.0 to interrupt down the knowledge.

RESULTS

A total of 240 patients with motorcycle injured within 24 hours were selected in this study. Age distribution of the cases is shown in Figure 1.

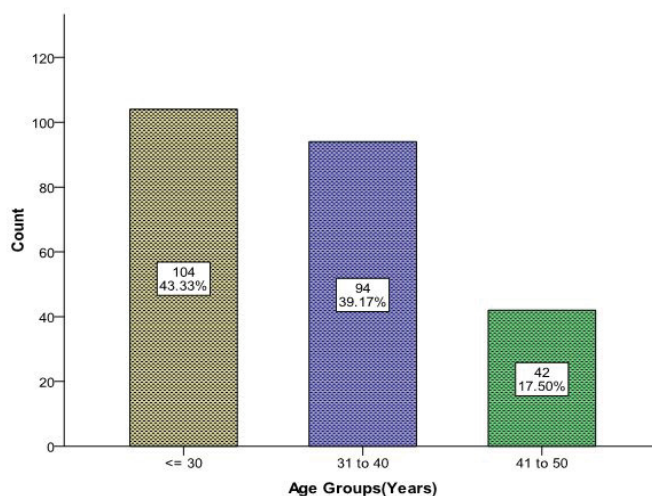


Figure 1 Age distribution of the patients (n=240)

The average age of the patients was 32.92 ± 7.30 years as shown in Table 1.

Table 1 Descriptive statistics of age and duration of injury

Descriptive Statistics	Age (Years)	Duration of Injury (in hours)
Mean	32.93	5.54
Std. Deviation	7.30	3.27
95% Confidence Interval for Mean		
• Lower Bound	32.00	5.13
• Upper Bound	33.86	5.96
Median	35.00	5.00
Interquartile Range	11.00	5.00
Minimum	18.00	1.00
Maximum	50.00	18.00

There were 200 (83.33%) male and 40 (16.67%) female (Figure 2). There were 44 (18.33%) patients who had not possessed licenses.

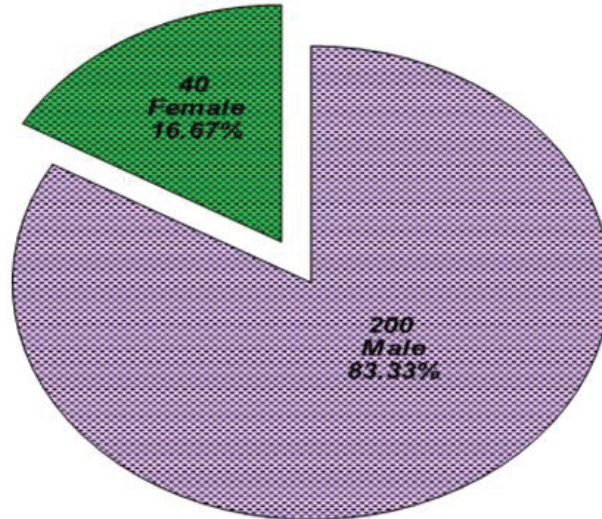


Figure 2 Gender distribution of the patients (n=240)

Out of 240 patients, femur fracture was found in 68 (28.33%), tibial fractures 134 (55.83%), there were 19 (7.92%) humerus fractures and radius-ulna fractures were observed in 19 (7.92%) as presented in Figure 3. Stratification techniques were used and observed that the rate of common fracture was a significant difference with different age groups (p=0.018) as shown in Table 2. Rate of common fracture was not significant with gender, duration of injury, possessed license. Rate of common fracture was significant with education (p=0.0005) while it was not significant with diabetes mellitus but significant with hypertension.

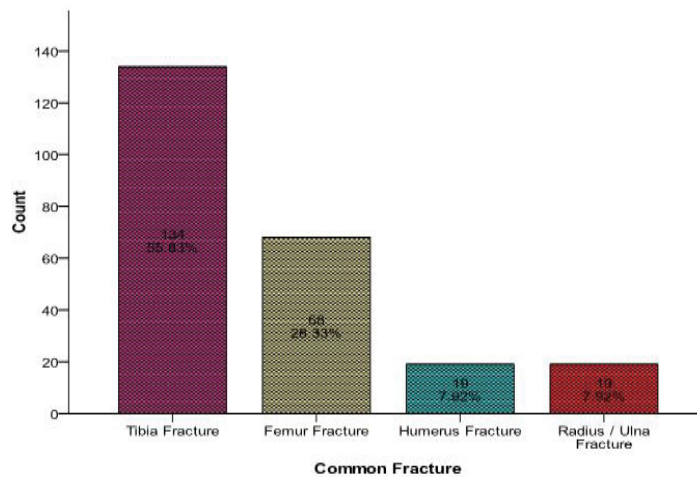


Figure 3 Frequency of common fractures secondary to a motorcycle accident (n=240)

Table 2 Frequency of common fractures secondary to motorcycle accident by age groups (n=240)

Common Fractures	Age Groups (Years)			p-value
	≤ 30 (n=104)	31-40 (n=94)	41-50 (n=42)	
Femur Fracture	36 (34.6%)	18 (19.1%)	14 (33.3%)	0.018
Tibia Fracture	50 (48.1%)	58 (61.7%)	26 (61.9%)	
Humerus Fracture	12 (11.5%)	6 (6.4%)	1 (2.4%)	
Radius/Ulna Fracture	6 (5.8%)	12 (12.8%)	1 (2.4%)	

Chi-Square=15.25

DISCUSSION

The national injury survey in West Pakistan has shown the yearly overall incidence of trauma to be 41 injuries for each a thousand persons [10]. This survey illustrates that road traffic accidents are one among the major issue for injuries. Road collisions are the second reason behind death among the youth (5-29 years previous folks) and also the third cause of death among 30-44 years old people [11]. The foremost common reason for morbidity and mortality within the most efficient amount of life worldwide are road traffic accidents inflicting fractures [12]. It is not shocking, therefore, that these fractures occur most in folks aged between 18 years and 55 years with a peak in the fourth decade with male predominance [13,14]. The common age of the patients was 32 years 0.92 ± 7.30 years. In our study the majority of the cases (47.28%) were between 21-30 years of age, United Nations agency was out of action due to a bike accident. In Khan study, 387 patients needing solely traumatic orthopedics treatment were between 16 years and 44 years elderly [15,16]. In an exceedingly native study done at Allied Hospital/Punjab Medical faculty, Faisalabad, Punjab, the age of out of action patients was between 3 years and 90 years with a mean of 46, 5 years with a peak frequency of 21-30 years 318 (31.7%) [17]. The explanation why the youth (at the age of 20-40 years) are concerned in bike can be explained by the very fact that at this age bracket majorities are engaged in productive activities that need them to maneuver quick enough from one space to a different and in thus doing are susceptible to risks of being involved in road traffic crashes. There have been 200 (83.33%) male and 40 (16.67%) female. Similar findings are reported elsewhere [18-21], equally in another study of 387 patients needing solely traumatic orthopedics treatment, the majority of that 354 were males (91.0%) [22]. In an exceedingly native study done at Allied Hospital/Punjab Medical faculty, Faisalabad, Punjab, a complete of 1003 patients were enclosed United Nations agency sustained road traffic injuries throughout the study amount of 1 year. 859 (85.6%) patients were male. About 144 (14.4%) were female (M: F magnitude relation of 6:1) [17]. The young males in their most generative and productive years were found to possess a high prevalence of bike accidents that have been attributed to the wide selection of risky activities performed by this category of individuals. Males have more exposure to traffic as a driver further as passengers as they need to travel long distances to figure and are more usually concerned within the use of an automobile as leisure activities. In Pakistan, a large proportion of bike riders are male, most of them use it for business purposes. There's augmented tendency in young males to possess reckless riding while not carrying a helmet, over rushing, overloading and riding beneath the influence of alcohol and/or dependence [17]. The bulk of fatalities occur in young male riders among the productive age bracket of 20-39 years [22,23]. In gift study out of 240 patients, femoris fracture was found in 68 (28.33%), leg bone fractures 134 (55.83%), there have been 19 (7.92%) arm bone fractures and radius-ulna fractures were determined in 19 (7.92%). In an exceedingly study out of 380 bones fracture femoris were 98 (25.8%), leg bone fractures were 165 (43.42%), there have been 10 (2.63%) arm bone fractures, and radius-ulna fractures were 43 (11.31%) [9]. Lower limb injuries contribute with the very best rates of morbidity and prolonged hospital keep and contribute from 18-80 of all the injuries [24,25]. The commonest pattern of orthopedic injuries is a fracture of lower limb bones significantly shin followed by fractures of the higher limb. This is often due to direct energy transfer to the bike riders and/or passengers throughout a collision. A study found that the proper facet of the body of trauma victims is presumably to be out of action [17]. Majority of open fractures are noted in lower limb predominately shin fractures. This results in comparable alternative studies [10,15], all told sorts of bike accidents, a lower proportion of injuries below 10 and on top of 60 years elderly is due to their less exposure to the external surroundings [10]. The vulnerability of the extremities above all the lower limbs can be due to a variety of things like anatomical location, lack of protectors on the extremity and poor assembly of the rear wheel. During this study like alternative studies from elsewhere, the most common lower limb injuries were found to be fractures of the shin and calf bone [18, 20, 26, 27]. Equally, in another study of 148 patients, lower and higher extremity injuries were 93 (62.8%) and 85 (57.4%) severally [28]. In an exceedingly study the foremost common orthopedic bike injuries were tibia/fibula, spine, and forearm fractures, that occurred in 238 (19%) evaluations, 203 (16.2%), and 127 (10.1%) severally [29]. In an exceedingly recent study, the femoris was the foremost broken os longum with 19 (38.78%) of its fractures occurring at its distal third, 17 (34.49%) of fractures occurred at its proximal third, whereas 13 (26.53%) at the midshaft. The tibia/fibula was next with fractures at its distal third, midshaft and proximal third accounting for 17 (45.95%), 12 (32.43%) and 8 (21.62%) of its fractures severally [30]. Equally, during this study, it had been found that foot, ankle, femur, fibula/tibia were the common fractures. In an exceedingly native study done at Karachi showed that there have been 210 (55.25%) closed fractures. In 165 patients (43.42%) it was found that fracture was of shin shaft. Open fractures of shin were determined in 107 patients (63.69%) [31]. In distinction to the on top of documented study we have a tendency to found wounds, bruises, closed fractures, open fractures, dislocations, sprains, tube-shaped structure injuries, ligament injuries, sinew

injuries and nerve injuries in downhill order. Per annum, great deals of individuals die in their productive age due to such kind of accidents and therefore resulting in vital socioeconomic impact each at the unit and national level [17].

CONCLUSION

From the results of this study, it is concluded that road traffic accidents (RTA) were incontestable to be a leading reason for bone fractures, particularly in people in their ordinal and third decades of life, constituting most of its victims. Males were ascertained to be preponderantly involved the lower extremity the foremost affected site of bone fractures of foot and knees. Majority of those accidents are preventable by an academic campaign of the general public, social control of traffic rules, provision of facilities for passengers, and upgraded observation system for transportation and drivers. Preventive programs and actions must be launched by policymakers of concerned departments and stakeholders at the national level. Alone a medical approach is short to save lots of lives of victims of such an accident

DECLARATIONS

Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

REFERENCES

- [1] Ameratunga, Shanthi, Martha Hajar, and Robyn Norton. "Road-traffic injuries: confronting disparities to address a global-health problem." *The Lancet*, Vol. 367, No. 9521, 2006, pp. 1533-40.
- [2] Mohan, Dinesh. "Road safety in less-motorized environments: future concerns." *International Journal of Epidemiology*, Vol. 31, No. 3, 2002, pp. 527-32.
- [3] Nantulya, Vinand M., and Michael R. Reich. "The neglected epidemic: road traffic injuries in developing countries." *BMJ*, Vol. 324, No. 7346, 2002, pp. 1139-41.
- [4] Solagberu, B. A., et al. "Motorcycle injuries in a developing country and the vulnerability of riders, passengers, and pedestrians." *Injury Prevention*, Vol. 12, No. 4, 2006, pp. 266-68.
- [5] Peden, M. M., Kara McGee, and Etienne Krug, eds. *Injury: a leading cause of the global burden of disease, 2000*. World Health Organization, 2002.
- [6] Omran, Abdel R. "The epidemiologic transition: a theory of the epidemiology of population change." *The Milbank Quarterly*, Vol. 83, No. 4, 2005, pp. 731-57.
- [7] Nantulya, Vinand M., and Michael R. Reich. "Equity dimensions of road traffic injuries in low-and middle-income countries." *Injury Control and Safety Promotion*, Vol. 10, No. 1-2, 2003, pp. 13-20.
- [8] Ghaffar, Abdul, Adnan A. Hyder, and Tayyeb I. Masud. "The burden of road traffic injuries in developing countries: the 1st national injury survey of Pakistan." *Public Health*, Vol. 118, No. 3, 2004, pp. 211-17.
- [9] Khani, Ghulam Mustafa Kaim, et al. "Pattern and severity of bony injuries among motorcyclist admitted in the orthopedic ward." *Journal of the Dow University of Health Sciences*, Vol. 7, No. 2, 2013.
- [10] Humail, S. M., et al. "Pattern and severity of limb injuries in victims of road traffic accidents attending tertiary care public sector hospital." *Journal of Pakistan Orthopedic Association*, Vol. 23, 2010, pp. 35-39.
- [11] World Health Organization. "World Health Day: road safety is no accident! World Health Organization calls for action to lower death and injury toll on the world's roads." World Health Day: road safety is no accident! World Health Organization calls for action to lower death and injury toll on the world's roads. 2004.
- [12] Greitbauer, Manfred, et al. "Unreamed nailing of tibial fractures with the solid tibial nail." *Clinical Orthopedic and Related Research*, Vol. 350, 1998, pp. 105-14.
- [13] Vallier, Heather A., Beth Ann Cureton, and Brendan M. Patterson. "Factors influencing functional outcomes after distal tibia shaft fractures." *Journal of Orthopedic Trauma*, Vol. 26, No. 3, 2012, pp. 178-83.
- [14] Wu, H. T., et al. "Clinical epidemiological analysis of adult spiral tibial shaft fracture associated with ipsilateral posterior malleolar fracture." *Zhonghua Yi Xue Za Zhi*, Vol. 88, No. 31, 2008, pp. 2166-70.

- [15] Khan, Alamzeb. "Prevalence of Orthopedic injuries in motorcycle accidents in patients presented to Khalifa Gul Nawaz Teaching Hospital, Bannu." *Khyber Journal of Medical Sciences*, Vol. 9, No. 2, 2016, pp. 155-60.
- [16] Debieux, Pedro, et al. "Musculoskeletal injuries in motorcycle accidents." *Acta Ortopédica Brasileira*, Vol. 18, No. 6, 2010, pp. 353-56.
- [17] Yousaf, Muhammad Nadeem, et al. "Pattern of Orthopedic injuries in motorcycle accidents." *Annals of Pakistan Medical College*, Vol. 7, No. 1, 2013, pp. 77-84.
- [18] Naddumba, E. K. "A cross-sectional retrospective study of Boda-boda injuries at Mulago hospital in Kampala-Uganda." *East and Central African Journal of Surgery*, Vol. 9, No. 1, 2004.
- [19] Zargar, Mousa, Ali Khaji, and Mojgan Karbakhsh. "Pattern of motorcycle-related injuries in Tehran, 1999 to 2000: a study in 6 hospitals." 2006.
- [20] Tham, K. Y., E. Seow, and Gilbert Lau. "Pattern of injuries in helmeted motorcyclists in Singapore." *Emergency Medicine Journal*, Vol. 21, No. 4, 2004, pp. 478-82.
- [21] Debieux, Pedro, et al. "Musculoskeletal injuries in motorcycle accidents." *Acta Ortopédica Brasileira*, Vol. 18, No. 6, 2010, pp. 353-56.
- [22] Kudabong, M., et al. "Economic burden of motorcycle accidents in Northern Ghana." *Ghana Medical Journal*, Vol. 45, No. 4, 2011.
- [23] Richter, Martinus, et al. "Upper extremity fractures in restrained front-seat occupants." *Journal of Trauma and Acute Care Surgery*, Vol. 48, No. 5, 2000, pp. 907-12.
- [24] Tomczak, Paula D., and Jane E. Buikstra. "Analysis of blunt trauma injuries: vertical deceleration versus horizontal deceleration injuries." *Journal of Forensic Science*, Vol. 44, No. 2, 1999, pp. 253-62.
- [25] Chalya, Phillip L., et al. "Injury characteristics and outcome of road traffic crash victims at Bugando Medical Centre in Northwestern Tanzania." *Journal of Trauma Management and Outcomes*, Vol. 6, No. 1, 2012, pp. 1-5.
- [26] Lateef, Fatimah. "Riding motorcycles: is it a lower limb hazard?" *Singapore Medical Journal*, Vol. 43, No. 11, 2002, pp. 566-69.
- [27] Kortor, J. N., W. Yinusa, and M. E. Ugbeye. "Lower limb injuries arising from motorcycle crashes." *Nigerian Journal of Medicine*, Vol. 19, No. 4, 2010, pp. 475-78.
- [28] Consunji, RJ, et al. Motorcycle-related trauma resulting in the Philippines hospital admission: the Epidemiology of Cases at the Philippine General Hospital. *Acta Medica Philippina*, Vol. 47, 2013, pp. 11-14.
- [29] Burns, Sean T., et al. "Epidemiology and patterns of musculoskeletal motorcycle injuries in the USA." *F1000Research*, Vol. 4, 2015.
- [30] Igho, Odokuma Emmanuel, Ogwara Akpoghene Isaac, and Osemeke Onyemaechi Eronimeh. "Road traffic accidents and bone fractures in Ughelli, Nigeria." *Spine*, Vol. 2, 2015, p. 93.
- [31] Khani, Ghulam Mustafa Kaim, et al. "Pattern and severity of bony injuries among motorcyclist admitted in the orthopedic ward." *Journal of the Dow University of Health Sciences*, Vol. 7, No. 2, 2013.