DOI: https://doi.org/10.53350/pjmhs221610336

ORIGINAL ARTICLE

An Audit of Injuries Sustained in Two–Wheeler Accidents in the Metropolitan City of Karachi, Pakistan

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ABSTRACT

Background: Road traffic accidents have major contribution in injury related mortality and disability in low income countries. Two-wheelers being a major mode of transportation due to absence of proper public transport system in Karachi hence most often reported accidents are related with two wheelers. In Karachi two wheelers are quite commonly being used as mode of transportation, number of two wheelers has increased to 10 folds since last 10 years because of lack of public transports and high fuel prices and easy availability on low monthly instalments.

Objective: To analyze the injury pattern among two-wheeler riders in Karachi.

Study Design: Retrospective study

Place and Duration of Study: Three major medico-legal centres of Karachi (Civil, Jinnah, and Abbasi Shaheed Hospitals) from 1st January 2017 to 31st December 2021.

Methodology: About 11444 two-wheeler incidents occurred on roads with the consent of Police Surgeon Office Karachi were enrolled. The patients' demographics, injuries sustained, date of the injuries, cause of the injuries, types of collision and outcomes were recorded.

Results: Most of the riders engaged in accidents were between the ages of 18 and 30 years; 90.99% of the riders were men. The most frequent type of injuries found in two wheeler accidents were abrasions/grazes seen in (56.26%) cases followed by fractures (20.82%), head injuries (11.02%).

Conclusion: Greater prevalence in the age group of 18-30 years, with male dominance analyzed. Fatal and non-fatal injuries were observed. Metro services mass transit programme to be encouraged so to decrease the traffic on road which will automatically reduce the number of accidents to wheeler as well as pillion riders strict efforts need to be made at both government and personal levels to reduce accidents in two-wheeler riders

Keyword: Riders, Pillion, Road traffic accidents

INTRODUCTION

Road traffic injuries are a major public health and development issue around the world.[1] According to the World Health Organization (WHO), road accidents were the 10th leading cause of death in 2016, and they are expected to rise to the 8th by 2030.[2] More than 1.35 million people die each year as a result of the road traffic injuries and another 50 million people sustain injuries that result in disability.[3] Over half of all road traffic fatalities in the world are among pedestrians, motorcyclists and cyclists whereas; one fourth of the casualties involve only motorcyclists.[4,5] The cause for this is the lack of full-body safety measures or protection mechanisms for drivers and passengers.[6] Motorcycle crashes account for 54 percent of all deaths in Singapore caused by any motor vehicle accident.[7] While between 1997 and 2006, the number of people killed in motorcycle accidents climbed by 103 percent in the United States.[8]

Acording to a survey conducted by Pakistan motorway 2019 around 16,000 causalities occur annually in road traffic accidents. Unsafe traffic conditions, poor road infrastructure, and encroachments are some of the factors that enhance the likelihood of road accidents.[4] According to 2018 statistics, motorcycles constitute nearly 74% of the total registered vehicles in Pakistan thus motorcycle accidents have become a serious safety concern in Pakistan.[9] Motorcycle crashes have surged as a result of the rapid increase in number of motorbikes combined with inadequate road safety conditions. A one year autopsy based study conducted in southern Punjab reported that majority of the victims of road traffic accidents were male motorcycle riders between the ages of 21 and 40 were more likely to suffer fatal injuries such as skull, neck, and spine fractures, as well as abdominal-thoracic injuries.[4]

Karachi is one of the most thickly populated city traffic is comprising mostly of two wheeler and in addition to that rickshaws, minibuses, donkey carts any transport vehicle and pedestrians, they use same road.[4] Two wheeler accidents contributes major part of road traffic accidents and considered to be a problem of developing countries majority of death are due to the two wheelers as the low income people mostly used motor bike for their mode of transport.[10] According to a study motorcyclists are involved in over 45 percent of all traffic crashes in Pakistan's largest metropolis (Karachi).[11] Pattern and severity of two-wheeler related injury mostly cause head and limb injuries creating most frequent cause of morbidity and motility mostly effecting the riders and up to an extent to pillion passengers. When evaluating RTAs, age and gender are two of the most critical risk factors to consider. Young males have been reported to be more prone to RTAs than other age groups and genders. As a result, it's critical to study the age and gender differences in the pattern of RTA deaths in Karachi's densely populated city in order to identify at-risk populations and implement preventive measures. RTAs are also categorised based on the anatomical cause of death and the location of the fracture. RTA fatalities have been observed to have a higher rate of head and cerebral injuries.[5,9] Doctors in emergency rooms can use this information to determine the severity of RTA situations and give timely and appropriate medical care.

In the present study, the purpose was to assess the characteristic of injury pattern amongst the both two-wheeler riders and pillion riders .We assessed age and gender-based variations in the injury pattern of road traffic accidents and determined the anatomical cause of death and sites of fractures among the riders and pillion.

MATERIALS AND METHODS

This retrospective study data were collected from the three biggest government run emergency departments (Abbasi Shaheed Hospital, Trauma Center CHK and Trauma Ward JPMC) of the city. Data was obtained after seeking permission of Police surgeon Karachi assuring with privacy and confidentiality. Five year data was evaluated from January 2017 to December 2021. The admissions registers of the departments were used to get the registration numbers of the patients. These were then used to retrieve patients' case notes. The information retrieved from the case notes included patients' demographics, the injuries sustained,

date of the injuries, cause of the injuries, types of collision and outcomes. The inclusion criteria included all two wheeler accident issued Medicolegal certificates while exclusion criteria was road traffic accidents in 4 wheelers or other than motorized two wheelers. The data were then entered into SPSS-21 for analysis.

RESULTS

Highest number of accidents was observed in years 2018 i.e. 2828 followed by 2802 in year 2019, while least number of accidents were witnessed in year 2020 that were 1400. Most of the riders engaged in accidents i.e. 4741 were between the ages of 18 and 30; 3303 were between the ages of 31 and 45; 2000 were the ages of 45 and above; and 1400 were below the ages of 18. 90.99% of the riders were men. The highest percentage of incidents was 44.99% occurred between 6 p.m. to 12 midnight, while the lowest percentage was 9% occurred between 12 midnigt to 6 a.m.

The most frequent type of injuries found in two wheeler accidents were abrasions/ grazes seen in (56.26%) cases, followed by fractures (20.82%), head injuries (11.02%) while blunt injury on abdomen was the least common type of injury found in (5.64%) cases. The majority of the cases (63.82%) were caused by collision with another vehicle (Fig. 1). Maximum two-wheeler accident-related fatalities were recorded in 2017 (21.99%) while the lowest was recorded in 2020 (16.89%) [Fig. 2[.

Table 1: Frequency of drivers got involved in two-wheeler accidents (n=11444)

Characteristics	No.	%
Year-wise accidents		
2017	2694	23.54
2018	2828	24.71
2019	2802	24.49
2020	1400	12.23
2021	1720	15.03
Age (years)		
< 18	1400	12.23
18 – 30	4741	41.43
31 – 45	3303	28.86
> 45	2000	17.48
Gender		
Male	10414	90.99
Female	1030	9.01
Time		
6 AM – 12 Noon	2201	15.99
12 Noon – 6PM	4128	29.99
6 PM – 12 Mid Night	6192	44.99
12 Mid Night – 6AM	1240	9.03
Type of injuries		
Abrasion /grazes	4760	56.26
Fractures	1762	20.82
Head injury	932	11.02
Blunt injury to thorax	530	6.26
Blunt injury to abdomen	477	5.64

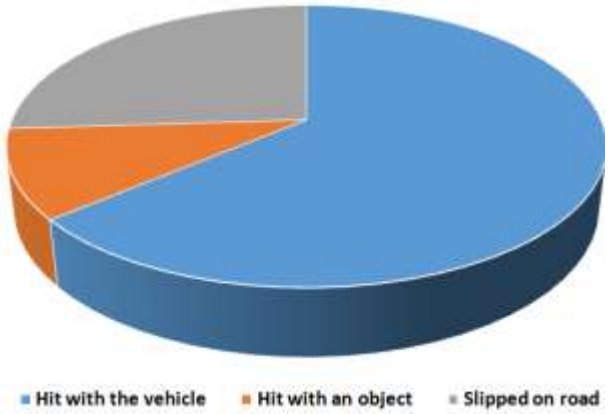

Fig. 1: Types of collisions

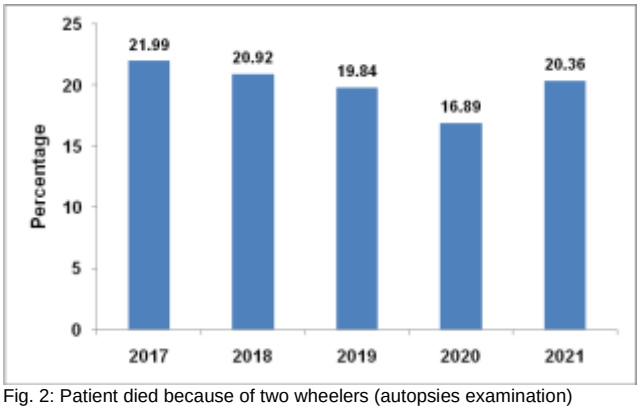

Fig. 2: Patient died because of two wheelers (autopsies examination)

DISCUSSION

The population growth rate is higher in the low and middle income countries which are called developing countries as compare to developed countries, with the escalation of population leads to increase in motor vehicles which resulted more road accident leading to deaths. Our study is focused on injury pattern and outcome of major injuries in two wheeler riders.

The gender and the age variations noted in the present study shows higher incidence in males between the age group of 18-30 years which is similar to those reported in previous studies conducted in Pakistan[12] as well as Bangladesh.[13] Cultural norms and higher level of outdoor activities may be the reason for higher number of cases observed in men. Young males exhibit more risk taking behavior like driving without following the driving rules, wrong side entry, driving adventurism, use of mobile phone, excessive speed, driving without helmet and case of drug and drive.[14]

It is observed that least number of accidents involving two-wheelers was reported in year 2020 in this five years study. The reason may be imposition of lockdown, work from home and online learning situations. Alike findings were reported in other studies conducted in Pakistan.[14] In contrast to a study in Dhaka reported increased number of cases during covid-19 lockdown. This may be due to surge in usage of bikes for delivery purposes.[13]

The highest reported cases were of hit on collision. These findings are consistent with results of other studies in Asia.[15-17] The most common reason for two-wheeler accidents presented in our study is hitting by another vehicles. As there are no separate lanes for motorcycles, very heavy traffic and narrow roads are some of the reason for above observation.

Our study also highlights the highest number of accidents were recorded in evening hours between 6 Pm till 12:00 midnight. Motorcyclists leaving from work are in rush to reach home, this may lead to their involvement in speeding and risky riding behaviour triggering in higher number of accidents. However, another study reported contradictory findings where accidents are monitored in morning hours between 6:00 Am-9:00 Am[18], mainly due to heavy traffic and impatient driving as they will be late for work, school etc.

The three leading common injury pattern sustained by riders in our study is by fatal blunt trauma which include abrasions, fractures and head injuries. Close findings are seen in a study from Egypt.[19] This type of trauma markings may result in serious injury and mortality among victims. The reason for the injury sustained due to skin lesions may be due to entanglement of loose fitting clothing, traditional dresses is one of the common reason in motorcycle accidents[20], another leading cause resulting in abrasions was due to slip and fall.[21] Fractures on the lower limb were most frequently found which is corresponding to a study by Sanyang et al[22] and by Aloudah.[23] This happens usually due to loss of traction, and skid out in both low and high speed crashes. Our study observed that head injuries is the leading cause of death

in two wheelers similar findings were reported in other studies conducted in Mumbai and Peshawar.[24,25]

CONCLUSION

Increasing number of automobile vehicle, poor adherence to traffic rules, lack of maintaining lane discipline, driving in zigzag patterns, overcrowded roads and lack of use of helmets are altogether responsible for accidents. Youngsters are fond of riding a high speed that results fatal accidents and causing disabilities even death.

It is suggested that roads to be improved and repaired. Encroachments on the road should be discouraged. Strict rules and restrictions for road safety measures and wearing of helmet should be made compulsory along with license verification. Riders should be subject to severe fines and penalties and be required to drive entirely to the left. Limit the number of passengers (pillions) they carry as well as their speed.

REFERENCES

1. World Health Organization. United Nations road safety collaboration: a handbook of partner profiles
2. World Health Organization. Global status report on road safety 2018: Summary (No. WHO/NMH/NVI/18.20). World Health Organization. 2018.
3. Sarwar Shah SG, Khoumbati K, Soomro B. The pattern of deaths in road traffic crashes in Sindh, Pakistan. Int J Injury Control Safety Promotion 2007; 14(4):231-9.
4. Ali F, Ahmed M, Kamran QU, Batool S, Ansari AJ, Tariq F, Qasim AP. Motorized two-wheeler accidents; a leading cause of death and disabilities: autopsy based study in tertiary care hospital. APMC 2021;15(1):55-9.
5. Abedi L, Sadeghi-Bazargani H. Epidemiological patterns and risk factors of motorcycle injuries in Iran and Eastern Mediterranean Region countries: a systematic review. Int J Injury Control Safety Promotion 2017; 24(2):263-70.
6. Oltaye Z, Geja E, Tadele A. Prevalence of motorcycle accidents and its associated factors among road traffic accident patients in Hawassa University Comprehensive Specialized Hospital, 2019. OAEM 2021; 13: 213.
7. Leong QM, TsungShyen KG, Appasamy V, Chiu MT. Young adults and riding position: factors that affect mortality among inpatient adult motorcycle casualties: a major trauma center experience. World journal of surgery. 2009 Apr;33(4):870-3.
8. Savolainen P, Mannering F. Probabilistic models of motorcyclists' injury severities in single-and multi-vehicle crashes. Accident Analysis Prevention 2007;39(5):955-63.
9. Pervez A, Lee J, Huang H. Identifying factors contributing to the motorcycle crash severity in Pakistan. J Advan Transport 2021;2021:28.
10. Mohan D. Road traffic crashes, injuries and public health. Economic Political Weekly 2001: 4656-62.
11. Shamim S, Razzak JA, Jooma R, Khan U. Initial results of Pakistan's first road traffic injury surveillance project. Int J Injury Control Safety Promotion 2011;18(3):213-7.
12. Khan KM, Jamil M, Memon IA, Idrees Z. Pattern of injuries in motorbike accidents. Journal of Pakistan Orthopaedic Association. 2018 Sep 30;30(03):123-7
13. B.Zafri NM, Khan A, Jamal S, Alam BM. Impact of COVID-19 Pandemic on Motorcycle Purchase in Dhaka, Bangladesh. Frontiers Future Transport 2021;2:646664.
14. Khurshid A, Sohail A, Khurshid M, Shah MU, Jaffry AA. Analysis of road traffic accident fatalities in Karachi, Pakistan: an autopsy-based study. Cureus 2021;13(4).
15. Tomida Y, Hirata H, Fukuda A, Tsujii M, Kato K, Fujisawa K, Uchida A. Injuries in elite motorcycle racing in Japan. Br J Sports Med 2005;39(8):508-11.
16. Jha N, Srinivasa DK, Roy G, Jagdish S. Injury pattern among road traffic accident cases: a study from South India. Indian J Community Med 2003;28(2):84-90.
17. Prakash KS, Sanjeev K, Singh O. Prospective studies on pattern of two wheeler injuries in road traffic accidents. Medico-Legal Update 2021;21(1).
18. Pervez A, Lee J, Huang H. Identifying factors contributing to the motorcycle crash severity in Pakistan. J Advanced Transport 2021; 2021
19. Younis RH, Adel R. Forensic Medical Study of Road Traffic Accident Cases Admitted to Minia University Hospital. Mansoura J Forensic Med Clin Toxicol 2019;27(2):1-1.
20. Khan UR, Bhatti JA, Shamim MS, Zia N, Razzak JA, Jooma R. Clothing-related motorcycle injuries in Pakistan: findings from a surveillance study. Int J Injury Control Safety Promotion 2015;22(4):308-13.
21. Sanjay SU. A retrospective autopsy-based study on the pattern of head injuries in pillion riders involved in fatal road traffic accidents and proposed safety measures. Int J Med Toxicol Forensic Med 2018;8(2):71-8.
22. Sanyang E, Peek-Asa C, Bass P, Young TL, Daffeh B, Fuortes LJ. Risk factors for road traffic injuries among different road users in the Gambia. J Environmental Public Health 2017;2017.
23. Aloudah AA, Almesned FA, Alkanan Jr AA, Alharbi T. Pattern of fractures among road traffic accident victims requiring hospitalization: single-institution experience in Saudi Arabia. Cureus 2020;12(1).
24. Sabale MR, Kumar NB, Kukde HG, Jaiswani AK. Comparitive analysis of computed tomography scan and post mortem findings in cases of head injury at a tertiary health centre. 2019;13(1):144.
25. Ishaq M, Ahmed A, Alam I, Khan M, Shah SN. Patterns of motorbike accidents related head injuries in patients presenting to a tertiary care hospital of Peshawar. Pak J Neurol Surg 2017;21(2):79-85.