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Motorcycle Accidents, A Real Burden & Challenge of Health Care System in Tertiary Care Hospital

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ABSTRACT

Objectives: To find out the incidence, modalities, reasons of injuries and existing burden of motorcycles trauma in the Orthopedics department, of a tertiary care Hospital.

Patients and Methods: This study was performed among patients that presented to the department of orthopedic surgery unit II, via accident and emergency from 1st September 2015 to 1st December 2015. Patients of both gender, age above 11 years, presented in emergency calls of unit II were included in the study. All patients were initially managed as per "Advance Trauma and Life Support" principles in Emergency department of PIMS and later either discharged or admitted.

Results: Total 973 patients were categorized into four major groups, including 709 road traffic accidents, 186 incidental traumas, 29 assaults and 49 miscellaneous injuries. Road traffic accidents which were 73% of a total number of cases had a major share in the data. Among these 709 patients of road traffic accidents, 71% cases were the motorcycle riders. Among all motorcycle accidents, 36% riders were between 16 years to 25 years of age and the most grievous trauma was seen in this age group. Regarding license holding age, only 34% people had a driving license while remaining all were without a license.

Conclusions: The motorcycle trauma ranges from minor abrasions to the long live disability. It is a huge percentage among all types of trauma and casualties showing the burden on the health system and ultimately the families who would be end sufferers. Younger population is more prone to the grievous injuries that ultimately pertain for a long time or some of them would be living with the permanent disability.

Key Words: Disability, Fractures, Motorcycles, Trauma

Author`s Contribution
[1,3]Active participation in active methodology, Review the Study,
[2]Synthesis and Planning of the research
[1,2]Conception, Interpretation and discussion

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Introduction

Mankind has been progressing towards the prosperity and financial stability since its beginning. Transport and roads are the cardinal facts and truths of this development. As the development has been progressing, the population per unit area is increasing. Ultimately the frequent and rapid mobility by two wheelers is increasing the risk of trauma and accidents. The increase in population load per unit area has been distorting the available resources, exhausting the infrastructures, imbalance between rights and obligations. Road side accidents and trauma have been increasing enormously for past twenty years. It has been observed that the resources of dealing with drastic

trauma and major accidents are declining in trauma centers and hospitals. A remarkable increase has been observed in vehicles in last 15 years.

In economic terms, the cost of road crash injuries is projected at roughly 1% of gross national product (GNP) in low-income countries, 1.5% in middle-income countries and 2% in high-income countries.[1] The economic cost of road crashes and injuries is estimated to be over Rs100 billion for Pakistan.[2] Public transport usage has declined and not preferred on personal vehicles irrespective to that they are two or four-wheel vehicles. Two wheelers and three wheelers are the priority of lower socioeconomic groups as they are in the financial range.[3] There are many contributing factors in this reality, including the decline in the profile of public transport, over filling of that, more time consuming and no schedules. No supervision, no check and balance on the public transport system is a contributing factor in its down fall. According to the World Health Organization (WHO) 2011 fact sheet, "over 90% of the world's fatalities on the roads occur in low-income and middle-income countries, even though these countries have less than half of the world's vehicles.[4] In a 2009 report, WHO estimated that in Pakistan road traffic injuries result in 25.3 deaths per 100,000, which is high by the international organization's standards.[5] Traditionally, the data sources for epidemiological assessments of RTAs in Pakistan have records from accident and emergency departments, surgical and intensive care units of specific hospitals and, more commonly, the police stations but the hidden data which has not been registered is an ice burg of unknown.[6,7] It is estimated that 45% of road traffic fatalities in low-income countries are among pedestrians, whereas an estimated 29% in middle-income and 18% in high-income countries are among pedestrians.[8] In Hong Kong, pedestrians accounted for 70% of RTA fatalities. On the other hand, in China, Malaysia, and Thailand, pedestrian deaths are between 10-15% but over 50% of deaths due to RTA involved motorcyclists.[9]

High-velocity vehicles, carpeted and smooth roads, poor legislation and weak implementation of penalties and fine are leading causes of uprising road traffic accidents. In past one and half decade, the number of vehicles has been enormously raised in the cities and the inter city and intra-city movements of public as well. Among all vehicles, motorcycle trauma is most challenging and drastic for the sufferers, families of the victims. Drastic traumas require technical skillful professionals and gadgets which are not widely available in our country health system. Complicated surgeries, special implants, and prosthesis, post-surgical ICU care, ventilators support in public hospitals, all are not well advanced. Even the five big cities of the country do not fulfill the technical requirements of public sector health care system. Specialties are not available in our DHQ and THQ services of small towns. If some the consultants are working there, they don't have the backup support. Ultimately the complicated trauma cases are referred to main cities which are already exhausted and overcrowded. Thus, our emphasis is prevention from drastic trauma on motorcycles. Strict legislation and tough implementation of rules with heavy fines on violation can bring a decline in the major trauma and if this decline is successful, the overall health care system will be more efficacious for other deprives. All effort is made because the massive bike injuries are preventable. In this study, most important aspect of the preventable trauma of road traffic accidents that is motorcycle trauma was aimed to be studied in detail.

Patients and Methods

In this cross-sectional study, a total number of cases of trauma presenting to Orthopedics department, via emergency were included. Duration of this study was 1st September 2015 to 1st December 2015. These cases were first categorized into four types of trauma: road traffic accident, incidental trauma, assault injuries and miscellaneous. The incidental trauma included all other varieties of trauma including direct and indirect trauma, sports injuries and trivial trauma. There was no gender discrimination in the data. All geriatric fractures, pathological fractures, and associated injuries were the part of this group. Fresh trauma cases, old referred cases from the periphery, infected trauma cases and neglected trauma cases all were included in this study. However, cases of soft tissue and bone infections like chronic osteomyelitis, septic arthritis of joints, abscess or empyema at the extremity and pediatric trauma were excluded from this study. The assault injuries were kept into a separate group because they were medico legal

cases and needed other departmental involvement. The assault category included fire arm injuries, stab injuries and aimed injuries.

Regarding road traffic accidents, the data was subdivided with respect to the nature of vehicles. There were four groups designed; four-wheel vehicles, motorcycle, bicycles and miscellaneous. Although motorbikes and cycles both are of the same category but still they were kept into two main groups. The reason is, use of cycle in our society is limited now a day. Either it is used by a low socioeconomic group or as a sports vehicle. In a miscellaneous group, three wheels (Auto Rikshaws, Ching chee, Carts) were included.

The number of patients received in accident and emergency were grouped into three categories to see the commonest age group presenting with trauma. First group included patients below the age of 15 years. Remaining two groups were from 16 years to 25 years and from 26 years to 60 years respectively. The patients were also grouped on basis of holding the driving license or not.

Results

The total number of reported cases in an emergency were 973. They were categorized into four groups. Out of these, 709 (73 %) cases were road traffic accidents, 186 cases (19%) were of incidental trauma, 29 (3 %) were assault injuries and 49 (5 %) were the miscellaneous injuries. Regarding vehicle types, road trauma in 503 patients (71%) was due to motorcycles. In 188 (26%) patients' accident and trauma was due to four-wheel vehicles. Only 11 (2%) cases were due to bicycle injuries (Figure 1).

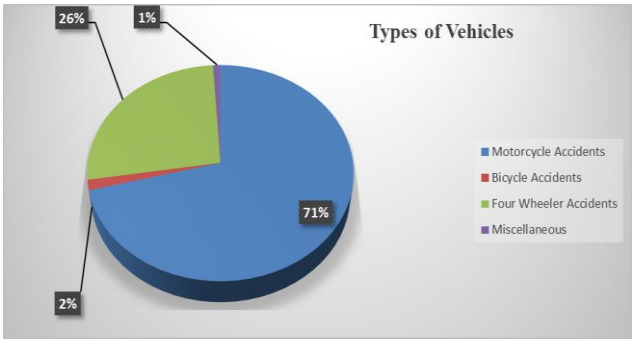

Figure 1: Types of vehicle responsible for road trauma among patients presented in emergency (n=709)

As regards the age group of motorcycle accidents cases (503), 226 (45%) riders were in the age group between 26 to 50 years. Total 183(36 %) cases were in the age group between 16 to 25 years (Figure 2). Regarding license holding age, only 168(34%) people had a driving license while 268(53%) riders had never a license. Total 67(13%) individuals were below the age of holding a bike riding license.

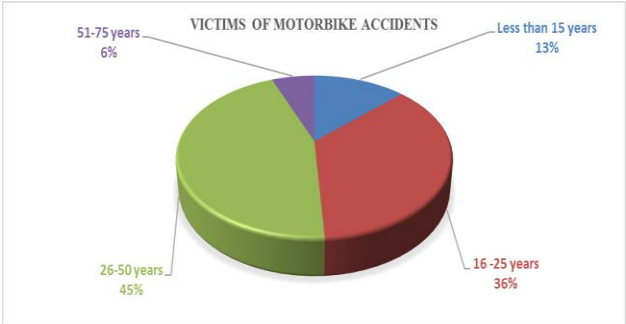

Figure 2: Age groups among victims of motorbike accidents (n=503)

Discussion

Road traffic accidents are major series of trauma presenting to the Orthopedic department via emergency. The accidents range from minor abrasions to poly-trauma cases and often the life-threatening situations. Among all sorts of motor vehicle injuries, motorcycle trauma is most debilitating and disastrous.[10] It accounts almost three fourth of the total emergency cases presenting to the department of orthopedic. Their trauma is of high velocity, leading to prolonged disability and financial burden on the family.[11] There is no social or government based designed backup mechanism for the people support.[12] Another study from a developing country showed 66% of lower limb injuries in motorbike accidents where cases of fracture of the tibia were in the highest proportion of cases followed by femur injuries, though study had a limitation of small sample size.[13] A Swedish cohort study revealed heavy burden of accidents involving young motorbike riders (age 16 to 30 years).[14] The same age group is observed to be the most vulnerable to motorbike accidents in our part of the world and this study has also shown the highest number of motorbike injuries in the same age group.[15] Lower limb injuries would put a behavioral and social impact on individuals. In this regard, Lower Extremity Assessment Project (LEAP) in the United States has elaborated on the demographic and social

effects of lower limb injuries.[16] Rolison *et al*, reported that fatality and injury rate among the motorcyclists and their pillion riders is the highest in comparison to other road users.[17] Among the emerging economic countries, Malaysia is among the Association of Southeast Asian Nations (ASEAN) countries that have the highest rate of fatality and more than 50 percent of road deaths are among the motorcyclists.[18,19]

In this study, it was a trembling point that majority of motorcycle riders had never applied for a license, they never needed it. There was a significant population of youngsters who were below 15 years of age, not capable of getting a license, not allowed to ride bikes on main roads but still, they were facing a significant trauma. It was not surprising for us that majority of children facing motorcycle accidents below the age of 15 were the owner of motorbikes. Either they were gifted by their parents or assigned by some authority where they were working. Such youngsters usually encounter the fatal or disabling trauma because they are unable to tackle the situations rapidly during the trauma. We received many youngsters in our emergency that either died or ended up with amputation of a limb out of four. In addition, since children, teenagers and active economic population are highly involved in motorcycle crashes, much attention is directed to this kind of accident due to the high rate of life lost ratio and cost involved.[20, 21]

Youngers population is riding the unsafe and high-velocity motorcycles which are emerging popular source of traveling and are increasing the frequency of disabilities in this age group.[22] Penalties for violations are very low. Red signal breaking for a motorcyclist charges him with 200 rupees only. Not wearing the safety helmet charges a motorcyclist only 200 rupees. Similarly, rash riding, drifting with ordinary bikes and mechanical modifications for speed enhancement is not a punishable offense in our country. Over speeding, one wheeling and drifting are supposed a tiny violation of traffic rules in Pakistan. On serious violations, motorbikes are fined with a small amount of fine. There is no firm legislation or punishment on all above-said objectives. We need the improvement in law, increase in fines of violations and better designed safe motorcycles with improved breaking and road grip mechanics. By this number of massive traumas and debilitating injuries that are the socioeconomic burden and loss of lives can be declined.

Conclusion

We concluded that the huge number of motorcycle trauma is preventable if awareness programs at different levels and law enforcement with heavy fines on violations of rules are implemented.

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