

MAGNITUDE AND PATTERN OF INJURIES IN PATIENTS VISITING ACCIDENT AND EMERGENCY DEPARTMENT OF COMBINED MILITARY HOSPITAL, RAWALPINDI - A CROSS SECTIONAL STUDY

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ABSTRACT

Objective: To determine the magnitude and pattern of injuries and their associated contributory risk factors in patients visiting accident and emergency department.

Study Design: Cross sectional study.

Place and Duration of Study: Department of Accident & Emergency, Combined Military Hospital, Rawalpindi, from Jun to Sep 2019.

Methodology: The sample population comprised of 250 patients with traumatic injuries visiting Accident and Emergency department, Combined Military Hospital, Rawalpindi. A structured questionnaire was used to collect data. Abbreviated Injury Scale was used to assess the injury level of the patients. SPSS version 21 was used for data analysis.

Results: Out of 250 patients included in the study, 197 (78.8%) were males and 53 (21.2%) were females. Mean age of the respondents was 36.5 ± 12 years. Most common cause of injury was road traffic accidents being 159 (63.6%). Majority of patients were males between the age group of 25-45 and belonging to rural areas. Two hundred and thirty five (94%) cases of injuries were unintentional.

Conclusion: Road traffic accidents were found to be a major contributing factor in un-intentional injury especially among males. Therefore, appropriate preventive strategies must be strengthened and implemented against Road Traffic Accidents. It has been suggested that teenagers and adults must be educated in teaching institutions and at work places to prevent such intentional and un-intentional injuries.

Keywords: Burns, Depression, Intentional/unintentional injuries, Road traffic accidents, Suicide, Trauma.

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INTRODUCTION

Injury has profound effect on an affected individual as well as on an entire community due to premature death and disability. It constitutes a leading health problem across the world, including intentional or unintentional injuries. It is becoming one of the major public health issues that causes significant social, mental, psychological and economic crisis, individually and on a community. Injuries remain a significant cause of morbidity and mortality, both in underdeveloped and developed countries. However, injury cases in low- and middle-income countries across the world are accountable for 90% or more¹. Injury has been described as body damage caused by an exchange with environmental energy that is

beyond the body resilience². World Health Organization (WHO), in the year 2008, estimated mortality of about 5.1 million people per year, globally, on account of injuries and violence, constituting the leading public health challenge of our time³. Traumatic injuries, either intentional or unintentional, constitute 16% of the burden of disease, worldwide⁴. People are exposed to different types of traumatic injuries day to day and are common in all age groups. Injuries, especially in road traffic accidents (RTA) are the leading cause of mortality among young population followed by injuries due to burns and electric current, which are mostly observed at home or at workplace^{5,6}. However, literature shows different pattern of injuries, such as fall from height, at home or at workplace, homicidal attack, sport related injuries along with RTA and burns⁶⁻⁸. Self-harm is one type of intentional injury that may be

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caused by interpersonal violence between intimate partners and homicidal attempts^{7,8}. Although injuries are considered as a preventable problem, they still remain significant public health issue affecting the health and the wellbeing of our society⁹. In Pakistan, despite efforts at government level to reduce injuries, the incidence rate is expanding at an alarming rate. In addition, Pakistan has been facing a major issue in data reporting and recording mechanisms, leading to underestimation of injury related burden due to unavailability of sufficient statistics about the magnitude of problem¹⁰. Therefore, it is necessary to provide local data regarding injuries rate to the health care authorities, so that they can plan, instigate and implement efficient and effective strategies for injury prevention. Moreover, there is a need to find the magnitude of the issue along with its contributing factors. Hence, the main purpose of this research was to determine the magnitude and pattern of injuries and its associated factors that contributes to injury in patients visiting the Accident and Emergency (A&E) department of Combined Military Hospital (CMH), Rawalpindi.

METHODOLOGY

This hospital-based study using cross-sectional approach, was conducted from June to September, 2019 at Combined Military Hospital (CMH), Rawalpindi (RWP). CMH a military hospital providing tertiary care facilities, is located in the cantonment area of Rawalpindi. Using Yamane formula of sample calculation, keeping the anticipated frequency of the outcome at 33%¹¹ and absolute precision or margin of error being 5%, the sample size came out to be 314 with 95% confidence interval. Non-probability, convenience sampling technique was used to select participants. All those patients who visited A&E department with physical injury secondary to trauma, prior to appearing in hospital, were included in the study. Non-injured patient and brought dead on arrival individuals were excluded. Data was collected using structured questionnaire comprising sociodemographic details of the patients, type and place of injury as well as injury related

contributing factors. Abbreviated Injury Scale (AIS) was used to assess the injury level of the patients. AIS scale is a validated score-based scale, based on an anatomical coding system created by the Association for the Advancement of Automotive Medicine to classify and assess the severity of traumatic injuries. Score value is increased with severity i.e. higher the score, greater the severity. Microsoft Excel 2017 and SPSS-21 was used for data entry and analysis. Frequency and percentages in cross tabulation were used to arrange and organize the sociodemographic characteristics and other descriptive statistics of study participants. Mean and standard deviation of age and assessment of severity level of injury were also calculated.

Ethical Consideration

Ethical consideration was taken into account throughout the process of study. Formal permission was requested from the head office of Commandment of CMH, Rawalpindi, for data collection and other research related activities. Data collection process was started after getting the permission from Commandment of CMH, Rawalpindi. Patients and their attendants were verbally explained the motive behind the research and informed consent was taken before signing the informed consent. Anonymity was maintained during the entire process of research with all information kept confidential and no individual identifiers collected.

RESULTS

Out of the total 900 patients who visited A&E department over the study period, 299 patients were approached. Response rate was 83.6% as 250 of them agreed to participate in study. Majority of the study participants were males 197 (78.8%). The mean age of patients was 36.5 ± 12.1 years. Most of the patients 144 (57.6%) recruited for study were on daily wages followed by students 39 (15.6%). Among the 250 patients who consented to an interview, 100 (40%) had income ranging between 31-50 thousand PKR. Furthermore, 211 (84.4%) patients belonged to rural areas (table-I).

Frequency and Pattern of Injury

Injury cases in Accident and Emergency department was found to be 33%. Unintentional injuries accounted the primary cause of injury in 94% of total cases. Regarding mechanism of

Table-I: Sociodemographic characteristics of patients visiting accident & emergency department, CMH, Rawalpindi (n=250).

| Variables | Frequency (n) | Percentage (%) |
|------------------------------|---------------|----------------|
| Age (Years) | | |
| 16-25 | 39 | 15.6 |
| 26-35 | 92 | 36.8 |
| 36-45 | 82 | 32.8 |
| 46-55 | 15 | 6.00 |
| 56-65 | 22 | 8.80 |
| Gender | | |
| Male | 197 | 78.8 |
| Female | 53 | 21.2 |
| Occupation | | |
| Daily Wages | 144 | 57.6 |
| Government Employee | 17 | 6.8 |
| Driver | 08 | 3.2 |
| House wife | 17 | 6.8 |
| Office Runner | 08 | 3.2 |
| Private Employee | 09 | 3.6 |
| Student | 39 | 15.6 |
| Technician | 8 | 3.2 |
| Monthly Income (PKR) | | |
| 10000 - 30000 | 65 | 26.0 |
| 31000 - 50000 | 100 | 40.0 |
| 51000 - 70000 | 55 | 22.0 |
| >71000 | 30 | 12.0 |
| Location of Residence | | |
| Urban | 39 | 15.6 |
| Rural | 211 | 84.4 |

injury, most of the cases 159 (63.6%) were road traffic accidents (RTA), followed by fall from height 61 (24.4%) and shock due to electric current 30 (12%). The significant proportion 148 (59.2%) of injuries occurred on streets due to RTAs (fig-1).

Injury Related Contributing Factor

Many contributory factors were identified which were directly related to unintentional and intentional injuries. Rash driving 93 (37.2%),

weapon related injury 52 (20.8%) and walking on the road 47 (18.8%) were the significant factors, however, 65 (26 %) of the patients did not declare any reason for injury (fig-2).

Body Part or Region Affected/Injured

The body region that was found affected more frequently was spine 43 (17.2%), head 24 (9.6%), upper extremity 23 (9.2%) followed by

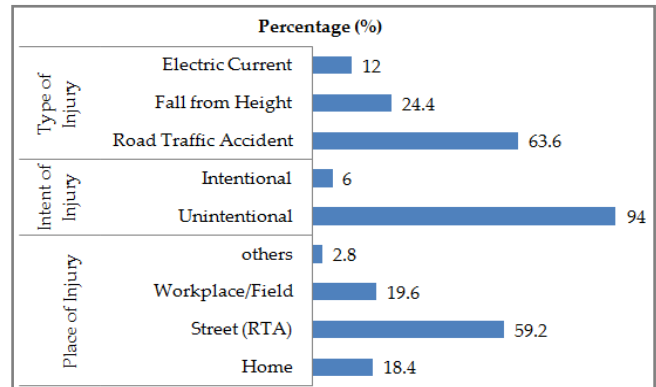


Figure-1: Pattern of injury among patients visiting accident & emergency department of CMH, Rawalpindi, (n=250).

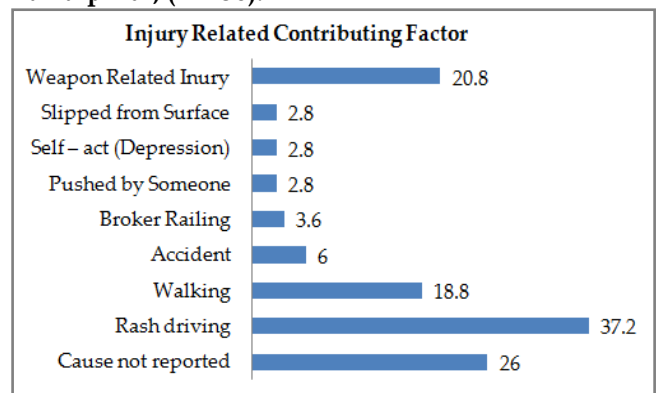


Figure-2: Contributing factors causing intentional & unintentional injuries percentage (n=250).

lower extremity 17 (6.8%), abdomen 16 (6.4%) and neck 15 (6%) (table-II). Patients were also asked about the treatment facilities and provision of on time services and treatment. Satisfaction rate for facilities was 90.4% and 81.2% reported that they received timely treatment.

Severity Level of Injuries

Injuries were classified depending on their severity using score based on AIS scale. The degree of injury has been differentiated and

characterized according to the injury severity. Results showed that 89 (35.6), 55 (22), and 84

Table-II: Body part/region affected due to injury in patients visiting accident & emergency department, CMH, rawalpindi (n=250).

| Body Part Affected / Injured | Frequency (n) | Percentage (%) |
|-----------------------------------|---------------|----------------|
| Un-specified | 14 | 6 |
| Head | 24 | 9.6 |
| Head + face | 9 | 3.6 |
| Head+ neck | 16 | 6.4 |
| Head + neck + abdomen + spine | 7 | 2.8 |
| Head + Neck + spine | 17 | 6.8 |
| Head + spine | 16 | 6.4 |
| Face | 7 | 2.8 |
| Face + Thorax + Spine | 9 | 3.6 |
| Neck | 15 | 6 |
| Neck + Spine | 7 | 2.8 |
| Abdomen | 16 | 6.4 |
| Spine | 43 | 17.2 |
| Upper extremity | 23 | 9.2 |
| Upper extremity + Lower extremity | 9 | 3.6 |
| Lower extremity | 17 | 6.8 |

(33.6%) of patients had increasing level of severity with 2, 3, and 4 scores respectively. However, only 7 (2.8%) patients were extensively injured with 5 score level (table-III).

Table-III: Assessment of severity level of injury using abbreviated injury scale (AIS).

| AIS Score | Severity | Frequency (n) | Percentage (%) | Mean ± SD |
|-----------|----------|---------------|----------------|---------------|
| 1.00 | Minor | 15 | 6 | 2.9 ± 1.02 SD |
| 2.00 | Mild | 89 | 35.6 | |
| 3.00 | Moderate | 55 | 22 | |
| 4.00 | Severe | 84 | 33.6 | |
| 5.00 | Fatal | 7 | 2.8 | |

DISCUSSION

Injuries, either unintentional or intentional are increasingly the common cause of mortality, morbidity and disability in all age groups worldwide. Our current study revealed that 33.2% of the patients who visited emergency were due to injury. This result was significantly high in comparison to the community-based research of Dar es Salam, Tanzania with 4.3% prevalence¹². It might be due to differences in the study settings,

as this research was conducted in the hospital setting, specifically in Accident & Emergency department. A study conducted in Cameroon, a Central African country, declared 27% which is slight lower than this study. However, the main difference is the study setting as our study was conducted in emergency department and the Cameroon study used a retrospective approach to collect injured patient’s data from ward logs¹³. On the contrary, Mutto *et al*; declared 70.4% prevalence in Uganda, which was approximately twice as compare to this study¹⁴. This incongruity can be justified by difference in reference population and the data source, since the findings of this study were based on primary data. Research conducted in Ethiopia (Prevalence; 70.5%) support Uganda study finding, though the main difference between the current work and Ethiopia study was the duration of study¹⁵. The findings of the Tikur Anbessa Specialized referral Hospital (TASRH) based study in Addis-Ababa is similar to the finding of this study¹¹. However, TASRH study included all departments of hospital instead of the emergency department. With regard to intent, intentional injuries are accountable for few (6%) of the injury cases presented to emergency department. In contrast, intentional injury cases were very high in Ethiopian institutional

based study and in Jimma Zone community-based study^{2,16}. This difference may be explained by the variation in study area. Regarding very high number of unintentional cases (96%) in this study, it might be due to the fact, that this study is hospital-based which include intentional injury cases more as compared to unintentional cases, due to the requirement of witness for legal requirements. The proportion of male injured cases were 78.8%, which makes a ratio between male

and female of 3:1, which was close to the studies of other countries^{2,17-19}. Outdoor activities, risk while travelling, especially in males, due to their risk-taking and emotional behavior, may explain the high proportion of males in our sample population. Age of individuals was also associated with injuries as approximately 70% studied patients fall within the age group between 25-45 years²⁰⁻²². This age group is more exposed to the outside world because of the energetic, active and struggling phase of life, actively involved in outdoor work to earn and practicing life independently. The economic impact of injury may be expected as the most productive age group bearing the burden of injuries. For developing effective preventive strategies and planning to reduce morbidity, mortality and disability, it is important to understand, address and discuss the affected age group. Automobile accident (RTA) was found to be the most common contributing factor accountable for 63.6% injured cases followed by fall from height (24.4%). These findings were contradicting with the finding of other studies in which RTA contributed to 33.9%, 130.3%²⁰ and 38.3%¹⁵. The site for injury occurrence was street in 59.2% followed by workplace (19.6%). Multiple factors may cause street injury cases, such as poorly constructed and unavailability of pedestrian footpaths, over-speeding of vehicles, lack of use of helmets and seatbelts and lack of traffic lights and signals especially in rural areas. It justifies the finding of this study that 84.4% patients were from the rural areas. Moreover, a study conducted in Qatar also reported the similar finding^{21,23}. Regarding assessment for the severity of injuries, current study showed that 35.6% of patients had mild injuries followed by severe injuries (33.6%) which required expert consultation and treatment, 22% moderate, 6% minor and the remaining 2.8% had fatal injuries. However, researchers reported variations in findings^{1,11,20,23}. The unstable financial status or low income increases the risk of injury. Findings of our study indicated that most of the injured cases (66%) had a monthly income of below 50 thousand PKR. This result is in line with the

study of Minnesota, which state that low income increases the risk of injury²⁴. Individuals of low socioeconomic group try to earn from other sources which might have increased health risk physically as well as mentally and psychologically due to continuous stress, impaired thought process and lack of work-related concentration¹.

LIMITATION OF STUDY

Since this research was conducted in an emergency department of a single hospital, it cannot be generalized to the entire population residing in the catchment area and prevalence of injury related cases may be over-estimated. In addition, only the injured patients who had visited the A & E department of the hospital during our study period were taken in consideration and a possibility of biases especially selection bias may be present.

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RECOMMENDATION

Teenagers and adults must be educated in school or colleges as well as work places to prevent and reduce injuries and accidents as they are more vulnerable to injuries. It is recommended that research on a large scale conducted on identifying determinant factors of RTA.

CONCLUSION

This research reveals that the frequency of injury related cases was considerably high in CMH, Rawalpindi with the most affected age group between 26-45 years of age. RTA accounted more than half of all injury cases therefore, suitable and relevantly applicable preventive strategies should be strengthened and implemented against RTA.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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