



ORIGINAL ARTICLE

## Presentation of trauma patients in a tertiary care hospital in Pakistan.

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**Article Citation:** Mushtaq S, Hussain E, Kannar S, Ali A, Ahmed Y, Hina S, Abid S, Muhammad R, Shaukar F. Presentation of trauma patients in a tertiary care hospital in Pakistan. *Professional Med J* 2022; 29(7):933-937. <https://doi.org/10.29309/TPMJ/2022.29.07.6270>

**ABSTRACT... Objective:** To observe the presentation, nature of injury and outcome of patients presenting with trauma in the leading emergency setting of Pakistan. **Study Design:** Cross Sectional. **Setting:** Jinnah Sindh Medical University/ Jinnah Postgraduate Medical Center. **Period:** July 2019 to December 2019. **Material & Methods:** Patient's age, location and mode of injury, duration from injury to emergency department, Glasgow coma scale (GCS), full outline of unresponsiveness (FOUR) score and outcome of patients were measured. **Results:** The most common age group presenting to the emergency department in tertiary care hospital in Karachi was between 18 to 40 (61.4%). The most common head injury was laceration (16.9%) and the most common chest injury was pneumothorax (2.6%). The most common mode of injury was road traffic accidents (76.8%). 73.3% had mild Glasgow coma scale (GCS) and the most common full outline of unresponsiveness (FOUR) score was between 13-16 (79.6%). **Conclusion:** Road traffic accidents are contributing to a significant number of patients coming to the emergency department with trauma. Head injury is very frequent in patients presenting to patients in ER.

**Key words:** Emergency, FOUR Score, GCS Score, Outcomes, Pakistan, Severity, Trauma.

### INTRODUCTION

Traumatic injury is defined as a physical injury of abrupt onset and severity that requires prompt medical attention. Injuries and trauma are common in modern society and can have severe consequences ranging from injury to brain and spine to cardiopulmonary injury, bone fracture and even to death.<sup>1</sup> Globally, more than 5 million deaths are reported each year caused by injuries and trauma with nearly 20% from road traffic injuries (RTI's).<sup>2</sup> Injuries and trauma are a focus of interest in low and middle-income countries (LMICS), where they are a major cause of morbidity and mortality.<sup>3</sup> In Pakistan, a low income developing country, injuries, and trauma are among the top ten contributors to disease burden and causes of disabilities, with most of the burden falling on children under the age of 18 years.<sup>2,3</sup>

injuries are transportation related, self-harm and falls, while the main cause of death include traumatic brain injury and hemorrhage. These facts seem to change depending on the increasing age of the patient population.<sup>4</sup> According to the World Health Organization (WHO), the death rate due to injuries and trauma in Pakistan is one of the highest in the world with more than 146,000 deaths each year, most of them being from RTI's and war.<sup>5</sup> A more recent data from Pakistan Health and Demographic Survey (PDS) indicates that injuries caused 42 deaths per 100,000 population or 6% of all deaths.<sup>6</sup>

There are multiple risk factors that contribute to the given statistics. Apart from being a low-income country, Pakistan has a higher number of young populations, and increased incidence of natural disasters such as floods, earthquakes, and airplane accidents. Compounded with these natural determinants, lack of legislation and

Worldwide, the prime mechanisms of traumatic

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**Article received on:** 11/12/2020

**Accepted for publication:** 15/01/2022

enforcement such as speed control, helmet and seatbelt use, terrorism and political instability also burden the already ill organized health care system.<sup>3</sup> This article focuses on the different presentation of trauma patients in a tertiary care hospital in Pakistan. This will assist in decision making in term of resource allocation and skills needed in ER, depending on type and severity of injury received in ER.

## MATERIAL & METHODS

This prospective study was conducted in the emergency department of Jinnah Postgraduate Medical Center from July 2019 to December 2019. Consecutive non-probability sampling was used to enroll patients. Ethical review board approval (JSMU/SMC/IRB-OFF/72) was taken before initiation of enrollment of patients. After enrollment, Patient's age, location and mode of injury, duration from injury to emergency department, Glasgow coma scale (GCS), full outline of unresponsiveness (FOUR) score and outcome of patients were measured. All the characteristics and score were recorded in a self-structured questionnaire. The collected data were analyzed using SPSS Version 21.0 (IBM Corp, Armonk, NJ). Frequency and percentage were calculated for categorical data.

## RESULTS

In this study, the total number of participants enrolled were Four hundred and twenty-seven (427). Male participants were 301 (70.5%) and female participants were 126 (29.5%). The most common age group was between 18 to 40 (61.4%) (Table-I).

Age Group	Frequency (%)
Less than 18	61 (14.3%)
Between 18 to 40	262 (61.4%)
Between 41 to 60	87 (20.4%)
Greater than 60	17 (4.0%)

**Table-I. Age group of participants**

In head Injury, the most common injury was laceration (16.9%), followed by edema (14.1%) (Table-II).

Type of Head Injury	Frequency (%)
Laceration	72 (16.9%)
Edema	60 (14.1%)
Skull Fracture	42 (9.8%)
Concussion	27 (6.3%)
Epidural Hematoma	24 (5.6%)
Subdural Hematoma	20 (4.7%)
Subarachnoid Hemorrhage	12 (2.8%)
Intracerebral Hematoma	5 (1.2%)
Cortical contusion	4 (0.9%)
Intraventricular Hemorrhage	2 (0.5%)

**Table-II. Type of head injury**

The most common chest injury was pneumothorax (2.6%), followed by chest wall contusion (1.9%) (Table-III).

Type of Chest Injury	Frequency (%)
Burn	3 (0.7%)
Chest Wall Contusion	8 (1.9%)
Flail Chest	1 (0.2%)
Hemothorax	2 (0.5%)
Laceration	4 (0.9%)
Pleural Effusion	2 (0.5%)
Pneumothorax	11 (2.6%)
Rib fracture	7 (1.6%)
Rib Fracture	1 (0.2%)
subcutaneous emphysema	1 (0.2%)

**Table-III. Type of chest injury**

The most common mode of injury was road traffic accident (76.8%), followed by fall from height (13.1%) (Table-IV).

Mode of Injury	Frequency (%)
Animal injuries	3 (0.7%)
Assault	14 (3.3%)
Burnt	4 (0.9%)
cylinder blast	1 (0.2%)
Electrical Injuries	4 (0.9%)
Fell from height	56 (13.1%)
General medicine	1 (0.2%)
Gunshot injuries	5 (1.2%)
Hit by Heavy object	5 (1.2%)
Occupational injuries	1 (0.2%)
Road Traffic Accident	328 (76.8%)
Slipped on ground	3 (0.7%)
Unknown mechanism	2 (0.5%)

**Table-IV. Mode of injury**

Most patients were brought to the emergency department within 1 hour (58.5%). 36.1% were

brought between 1 to 4 hours (Table-V).

Time Duration Between Trauma and Arrival	Frequency (%)
Between 1-4 hours	154 (36.1%)
between 12-24 hours	1 (0.2%)
Between 5-8 hours	11 (2.6%)
Between 9-12 hours	6 (1.4%)
Less than 1 hour	250 (58.5%)
More than a day	3 (0.7%)
Unknown	2 (0.4%)

**Table-V. Time duration between trauma and arrival**

73.3% had mild Glasgow coma scale (GCS), 14.5% had severe and 12.2% had mild GCS score (Table-VI)

Glasgow Coma Scale (GCS)	Frequency (%)
Mild 14-15	313 (73.3%)
Moderate 9-13	52 (12.2%)
Severe 3-8	62 (14.5%)

**Table-VI. Glasgow coma scale grading**

The most common Full Outline of UnResponsiveness (FOUR) score was between 13-16 (79.6%) (Table-VII).

Full Outline of UnResponsiveness (FOUR)	Frequency (%)
Between 13-16	340 (79.6%)
Between 5-8	30 (7.0%)
Between 9-12	36 (8.4%)
Less than 5	21 (4.9%)

**Table-VII. Full outline of UnResponsiveness (FOUR) Score**

42.4% participants were discharged in stable condition, while 7.3% participants expired (Table-VIII).

Outcome of the Patient	Frequency (%)
Admission for surgical intervention	138 (32.3%)
Discharged in stable condition	181 (42.4%)
Expired	31 (7.3%)
Referred Out	23 (5.4%)
Retained in Emergency	54 (12.6%)

**Table-VIII. Outcome of participants**

## DISCUSSION

The present study demonstrated that most of the trauma patients were between the age group of

18 and 40 (61.4%), with the most common mode of injury being road traffic accidents (RTA's) (76.8%) followed by fall from height (13.1%). This is consistent with the WHO findings, as Pakistan is a country comprising mostly of younger population where poverty, and more proximal determinants, including the lack of legislation and enforcement on issues such as building codes, speed control on roads, helmet use, seat belt use, and home safety measures lead to high incidence of RTA's.<sup>3,5</sup> According to a systematic review and meta-analysis conducted in Ethiopia, a low-income developing country like Pakistan, RTI's were the main reason for trauma-related hospital admissions (31.5%).<sup>7</sup> In Bangladesh, Mashreky et al. concluded that people aged 18-45 were the major victims of RTI's, constituting more than 70% of the total RTI-related admissions in primary and secondary level hospitals.<sup>8</sup>

Injuries to the Head and chest regions are a major cause of morbidity and mortality in trauma patients. The present study showed that lacerations followed by edema and skull fractures were the most common type of head injuries sustained in trauma patients; pneumothorax being the most common chest injury. In a study conducted in Nigeria, head injuries followed by chest were the most common in pediatric trauma patients, with higher odds of sustaining head injuries through road traffic accidents than through a fall from height.<sup>9</sup> However, in another study, a retrospective analysis performed on 1,138 pediatric trauma patients between 2012 and 2016 presented that musculoskeletal system injuries accounted for 68% of all the total injuries in pediatric trauma patients.<sup>10</sup> A retrospective review conducted in Saudi Arabia, that included adults (>18 years) with traumatic head injuries (THI), concluded that most head injuries were secondary to RTA's, with mortality rates reaching up to 40%.<sup>11</sup> Majority (58.5%) of the trauma patients in the present study arrived at the hospital in less than an hour which led to better outcomes. Timing is crucial in trauma settings as early detection and transport to the hospital can prevent various complications and reduce mortality rates in trauma patients.<sup>12</sup>

To assess the neurological function and to predict

the outcome and mortality of trauma patients caused by head injuries, Glasgow Coma Scale (GCS) and Full Outline of Unresponsiveness (FOUR) scores were calculated. Based on the outcome of our study, most traumatic patients had a GCS score between 14 and 15 (73.3%), indicating mild injury, and a FOUR score between 13 and 16 (79.6%). These high scores were associated with better outcome of the patients in the present study as most people were discharged after their condition stabilized (42.4%), with surgical intervention being required for only 32.3% of the trauma patients. The mortality rate in the present study was only 7.3%. Retrospective review from Saudi Arabia showed that most trauma patients had severe THI (GCS score between 3 and 8) with mortality significantly associated with older age, lower GCS score, and a higher injury severity score (ISS).<sup>11</sup> To determine the outcome in trauma patients with head injuries using GCS score, Pal et al. in their retrospective study concluded that recovery rate in patients with GCS 15-13 was much higher as compared to lower GCS scores with mortality rates reaching up to 41% in those with GCS score below 9.<sup>13</sup> It is important to monitor the GCS regularly as decreasing levels of GCS are an important indicator for increasing risk of ciTBI, neurosurgery and death.<sup>14</sup> Similar finding was found for pediatric population as well.<sup>15</sup>

The study has several limitations. First, since it was conducted in a single institution, care should be taken while inferring the result of a single institution to a large audience. Secondly, patients GCS and FOUR were recorded only once and change in GCS score and its impact on outcome was noted. This was due to limited resources and increased patient load.

## CONCLUSION

Trauma was common in the age group between 18 to 40 years and male gender. Road traffic accidents were the most common mode of injury. Head was frequently injured in traumatic injury. It is important to create awareness related to road traffic safety and the importance of helmets. Efforts should be made to ensure those who suffer from traumatic injury reach hospital as early as possible.





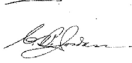
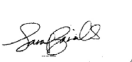
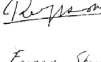
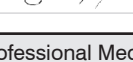
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## REFERENCES

1. Luo C, Tao L. **The function and mechanisms of autophagy in trauma of other parts of the body.** *Advances in experimental medicine and biology.* 2020; 1207:655-7. 10.1007/978-981-15-4272-5\_48.
2. Branche C, Ozanne SJ, Oyebite K, Hyder AA. **World report on child injury prevention: World Health Organization; 2008.** [https://apps.who.int/iris/bitstream/handle/10665/43851/9789241563574\\_eng.pdf;jsessionid=48CBA603BF2926303AFC432DA50965C7?sequence=1](https://apps.who.int/iris/bitstream/handle/10665/43851/9789241563574_eng.pdf;jsessionid=48CBA603BF2926303AFC432DA50965C7?sequence=1).
3. Hyder AA, Razzak JA. **The challenges of injuries and trauma in Pakistan: An opportunity for concerted action.** *Public Health.* 2013; 127(8):699-703. 10.1016/j.puhe.2012.12.020.
4. Relja B, Horstmann JP. **Traumatic injury.** *Experientia supplementum (2012).* 2018; 108:85-110. 10.1007/978-3-319-89390-7\_5.
5. Organization WH. **Eastern Mediterranean status report on road safety: Call for action.** 2010. <https://apps.who.int/iris/handle/10665/119908>.
6. **Pakistan federal bureau of statistics.** Pakistan Demographic survey – 2005. [accessed 1 Oct 2020]; n.d. Available at: <http://www.statpak.gov.pk/fbs/content/pakistan-demographic-survey-2005>.
7. Endalamaw A, Birhanu Y, Alebel A, Demsie A, Habtewold TD. **The burden of road traffic injury among trauma patients in Ethiopia: A systematic review and meta-analysis.** *African Journal of Emergency Medicine.* 2019; 9:S3-S8. 10.1016/j.afjem.2019.01.013.
8. Mashreky SR, Rahman A, Khan TF, Faruque M, Svanström L, Rahman F. **Hospital burden of road traffic injury: Major concern in primary and secondary level hospitals in Bangladesh.** *Public Health.* 2010; 124(4):185-9. 10.1016/j.puhe.2010.01.004.
9. Shour AR, Holmes B, Ameh EA, Olaomi OO, Anguzu R, Cassidy LD. **Motor vehicle accident is a risk factor for traumatic head injury among children in Abuja: Analysis of the first trauma registry in Nigeria.** *The Pan African medical journal.* 2019; 33:215. 10.11604/pamj.2019.33.215.19289.
10. Kiepura S, Dutka J, Wiczorek-Grohman M, Dutka Ł. **Traumatic Injuries in Pediatric Surgery in the Medical-epidemiological-economic Aspect.** *Ortopedia, traumatologia, rehabilitacja.* 2019; 21(4):261-70. 10.5604/01.3001.0013.5071.

11. Al-Habib A, A AS, Alaqeel A, Zamakhshary M, Al-Bedah K, Alqunai M, et al. **Causes and patterns of adult traumatic head injuries in Saudi Arabia: Implications for injury prevention.** *Annals of Saudi medicine.* 2013; 33(4):351-5. 10.5144/0256-4947.2013.351.
12. Chung JJ, Earl-Royal EC, Delgado MK, et al. **Where we fail: Location and timing of failure to rescue in trauma.** *The American surgeon.* 2017; 83(3):250-6. <https://pubmed.ncbi.nlm.nih.gov/28316308/>.
13. Pal J, Brown R, Fleischer D. **The value of the Glasgow coma scale and injury severity score: Predicting outcome in multiple trauma patients with head injury.** *J Trauma.* 1989; 29(6):746-8. 10.1097/00005373-198906000-00008.
14. Kochar A, Borland ML, Phillips N, et al. **Association of clinically important traumatic brain injury and Glasgow Coma Scale scores in children with head injury.** *Emerg Med J.* 2020; 37(3):127-134. 10.1136/emered-2018-208154.
15. Johnson MA, Nishijima DK, Kuppermann N. **The association of Glasgow coma scale score with clinically important traumatic brain injuries in children.** *Pediatr Emerg Care.* 2020; 36(11):e610-e613. doi: 10.1097/PEC.0000000000001701.

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