



Epidemiology and Pattern of Trauma Patients Admitted to a Tertiary Care Trauma Center in Western Rajasthan: A Study from Jodhpur Trauma Center

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Abstract

Background

Trauma is a significant cause of mortality and long-term disability in India. Region-specific hospital-based trauma data are essential to understand local injury trends and to improve trauma care delivery and prevention strategies. This study analyzes the epidemiology, injury patterns, mechanisms, and outcomes of trauma patients admitted to a tertiary care trauma center in Western Rajasthan.

Methods

A hospital-based observational study was conducted at the Jodhpur Trauma Center over a period of one year. Trauma patients admitted on systematically selected days of each week were included. Data collected comprised demographic characteristics, physiological parameters at admission, Glasgow Coma Scale (GCS), Injury Severity Score (ISS), mechanism of injury, anatomical distribution of injuries, referral status, and treatment outcomes. Descriptive statistical analysis was performed.

Results

A total of 67,940 trauma patients were analyzed. The mean age was 39.8 ± 15.7 years, and 67.60% of patients were male. Road traffic accidents were responsible for 49.9% of injuries, followed by falls (23.54%). Head injuries (30.9%) and lower limb injuries (31.5%) were the most common. The mean ISS was 11.6 ± 6.8 , and mean GCS at admission was 12.7 ± 3.9 . Referred patients had longer injury-to-admission intervals and lower GCS scores. In-hospital mortality was 16.2%, with one-year mortality rising to 22.4%.

Conclusion

Neurotrauma and orthopaedic injuries constitute the bulk of trauma admissions. Road traffic accidents remain the leading cause, particularly involving two-wheelers. Delayed access to definitive trauma care continues to adversely affect outcomes, emphasizing the need for strengthening prehospital and referral systems. This study raising the road traffic accidents as a public health problem which should be addressed as a preventable cause of morbidity and mortality.

INTRODUCTION

Trauma is one of the foremost causes of death and disability worldwide, with a disproportionate burden borne by low- and middle-income countries. India is the leading country in the number of deaths due to RTA⁰¹. In India, rapid urban expansion, increasing vehicular density, suboptimal road safety practices, and limited prehospital care infrastructure have significantly contributed to trauma-related morbidity and mortality.

Western Rajasthan presents additional challenges due to its vast geographical area, sparse population distribution, and delayed access to advanced trauma care facilities. Most available trauma data in India are derived from police records, which often underestimate injury burden and lack clinical detail. Hospital-based trauma studies provide more accurate information on injury patterns, severity, and outcomes.

The present study aims to evaluate the epidemiological profile, mechanisms of injury, injury patterns, and outcomes of trauma patients admitted to the Jodhpur Trauma Center, thereby generating region-specific evidence to guide trauma system strengthening.

Materials and Methods

Study Design and Setting

This observational study was conducted at the Jodhpur Trauma Center, a tertiary referral hospital catering to trauma patients from urban and rural regions of Western Rajasthan.

Study Population

All trauma patients admitted during the one-year (January 2025 to December 2025) study period were eligible. To reduce selection bias due to weekday variation, admissions from one preselected day each week were included.

Data Collection

Data were collected using a structured proforma and included:

Age and sex

Admission vitals (systolic blood pressure, respiratory rate)

Glasgow Coma Scale (GCS)

Time from injury to hospital arrival

Referral status

Mechanism of injury

Injured body region and Abbreviated Injury Scale (AIS)

Injury Severity Score (ISS)

Pre-existing comorbidities

Trauma Pattern Classification

Patients were categorized as:

Neurotrauma , Orthopaedic trauma, Neuro polytrauma, Orthopaedic poly trauma, other poly trauma

Results

Demographic Profile

Out of 67,940 patients, 45,931 (67.40%) were male and 22,009(32.40%) were female. The majority belonged to the 21–50 year age group.

Injury Severity and Physiological Parameters

Mean ISS: 11.6 ± 6.8

Mean GCS: 12.7 ± 3.9

Severe head injury (GCS ≤ 8): 20.8%

Blood transfusion requirement: 23.4%

Mechanism of Injury

Road traffic accidents were the predominant mechanism (49.9%), followed by falls (23.54%). Surgery case, Assault, firearm injuries, and occupational accidents constituted the remaining. Two-wheeler-related crashes formed the largest subgroup among RTAs.

Pattern of Injuries: The commonest site of fracture was lower limb (31.5%) followed by head injury (30.9%) and spine injury contributed(7.4%).

Head injuries: 30.9%

Lower limb injuries: 31.5%

Upper limb injuries: 12.1%

Spinal injuries: 7.4%

The cervical spine was the most frequently involved spinal segment.

Referral Status

Patients referred from peripheral hospitals had longer delays in reaching the trauma center, lower GCS scores at admission, and longer hospital stays compared to direct admissions.

Tables

Table 1. Demographic Profile of Trauma Patients(n = 67,940)

Variable	Number (%)
Mean age (years)	39.8+-15.7
Age 0-20 years	8764(12.9%)
Age 21-50 years	41715 (61.4)
Age >50 years	17460 (25.7%)
Male	45931 (67.60%)
Female	22009 (32.40%)

Table 2. Mode of Admission and Referral Status

Parameter	Number(%)
Direct admission	29,554 (43.5%)
Referred cases	38,386 (56.5%)
Mean injury to arrival time (hours)	51.2+

Table 3. Mechanism of Injury

Machanism	Numbers (%)
Road traffic accidents	33,917 (49.9%)
Falls	15,995(23.54%)
Assault	4,144 (6.1%)
Firearm injuries	45 (0.06%)

Machanism	Numbers (%)
Occupational/surgery case/others	13,839 (20.4%)

Table 4. Pattern of injury

Type of injury	Number (%)
Head injury	30.9%
Upper limb injury	12.1%
Lower limb injury	31.5%
Spinal injury	7.4%

Discussion

This study demonstrates that trauma admissions at a tertiary care center in Western Rajasthan predominantly involve young adult males. Road traffic accidents remain the leading cause of trauma which is similar result study by Bushu Harna et al^{2,3,4}, particularly those involving two-wheelers and pedestrians. The increasing number of vehicles and congestion along with industrialization and fast lifestyle in the region might be the cause of the increasing numbers. The study by Sogut et al.,⁵ concluded motor vehicle accidents and falls from the heights as the most common causes of trauma. This study found that more than 61.4% of the victims were in the age group between 21-50 years. This shows that the people of the most active and productive age group are involved in RTAs, which adds a serious economic loss to the community. Similar observations were also made by other^{6,7}. Among fractures, the present study found that lower limbs (31.5%) were the commonest site for fracture, followed by head injury (30.9%) and spine (7.4%). Similar findings were reported by Jha et al.⁸ Studies have reported that the highest number of fractures were in upper limbs followed by lower limbs and facial bones. However, their study was confined to only motorcycle accidents, whereas the present study takes into accounts all type trauma injuries. The extremities are commonly involved due to direct trauma of the vehicle or due to fall. The extremities are more vulnerable to injuries especially in motorcyclists because they are unprotected. Neurotrauma and orthopaedic injuries account for the majority of cases, highlighting the need for well-equipped neurosurgical and orthopaedic trauma services.

Delayed presentation, especially among referred patients, continues to be a major challenge and is associated with worse neurological status and outcomes. Falls were the most common cause of spinal injuries, reflecting region-specific occupational and environmental risk factors.

Limitations

This single-center study may not represent the complete trauma burden of the region. Prehospital deaths and minor injuries treated on an outpatient basis were not included.

Conclusion

Trauma primarily affects young, economically productive males RTAs, especially motorcycle-related, are the leading cause. Head and orthopaedic injuries predominate. Delay in reaching trauma centers remains a major challenge. Strengthening prehospital care, trauma referral systems, and road safety measures is essential.

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