

Burden and Prognostic Trends of Traumatic Brain Injury: Experience from a Tertiary Institution

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Abstract:

➤ Background:

Traumatic brain injury (TBI) is a major cause of morbidity and mortality worldwide¹. India carries a disproportionate burden due to rapid motorisation and weak road safety systems.

➤ Objective:

To evaluate epidemiology, risk determinants, radiological findings, clinical patterns, and outcomes among TBI patients in a tertiary care centre.

➤ Methods:

A prospective observational study of 200 patients admitted between October 2019 and June 2021.⁴

➤ Results:

Most patients were males (73%), mean age 31.16 years. Two-wheeler drivers (38.5%) and pedestrians (38%) comprised majority. Contusions were the most common CT finding (41%). Good recovery (GOS 5) occurred in 90.5%.

➤ Conclusion:

Young males are at highest risk. Strengthening road safety policies and prehospital care is essential.

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I. INTRODUCTION

Traumatic brain injury (TBI) affects nearly 69 million individuals annually¹, with low- and middle-income countries contributing the highest share. India reports one of the world's highest numbers of road traffic-related TBIs⁹. Road traffic accidents remain the leading cause, followed by falls and occupational injuries.

Young adults aged 18–45 years form the most vulnerable group, leading to significant socioeconomic impact⁴

Primary injury mechanisms such as contusions, hemorrhages, and diffuse axonal injury occur at impact, whereas secondary injury evolves through inflammation, edema, and ischemia⁷

Epidemiological data from India remain fragmented and region-specific¹⁰. This study aims to provide a detailed analysis of demographic, radiologic, and outcome patterns of TBI.

II. MATERIALS AND METHODS

This prospective observational study included 200 consecutive patients aged 5–65 years presenting with TBI due to road traffic accidents. Clinical severity was assessed using GCS, and outcomes using the Glasgow Outcome Scale.

CT findings, associated injuries, and management strategies were recorded. Statistical analysis used SPSS v16 with $P < 0.05$ considered significant.

III. RESULTS

Table 1 Age Distribution

Age Group	Patients
≤10	8
11–20	41

21–30	47
31–40	71
41–50	8
51–60	10
≥61	15

Table 2 Gender Distribution

Gender	Patients
Male	146
Female	54

IV. DISCUSSION

This study reaffirms trends in developing countries where young adult males predominantly suffer TBIs⁴. Two-wheeler users and pedestrians were the most affected, consistent with national injury patterns⁹

Night-time injuries constituted 89% of cases, likely due to reduced visibility and alcohol-related impairment⁶

Radiologically, cerebral contusions were most frequent, aligning with acceleration-deceleration forces in two-wheeler crashes²

Public health measures including strict helmet enforcement, improved road lighting, and strengthened trauma systems are essential for prevention⁸

Establishing regional TBI registries can support long-term surveillance and targeted policy development⁶

V. CONCLUSION

Young male two-wheeler users represent the highest-risk population. Most cases are preventable through improved road safety, community education, and development of robust emergency care systems.

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