

**Original article:**

## Study of management of head injury cases

<sup>1</sup>Dr Chetan M. Savani , <sup>2</sup>Dr. Raj Krishna Goyal

<sup>1</sup>Assistant Professor, Department of Surgery, Index Medical College, Hospital & Research Centre, Indore, MP, India

<sup>2</sup>Assistant Professor, Department of Orthopedic, Amaltas institute of medical sciences, Dewas, MP, India

Corresponding author: Dr. Raj Krishna Goyal

Date of Acceptance: 10 .8.2018

### Abstract

**Background:** Head injuries present a significant healthcare challenge, with diverse etiologies and variable clinical outcomes. Understanding the demographic characteristics, injury patterns, management strategies, and long-term outcomes associated with head injury patients is crucial for optimizing care and improving outcomes.

**Methods:** A retrospective study was conducted over one year, involving 50 head injury patients admitted to our Hospital. Data on demographic characteristics, injury types, management strategies, surgical interventions, complications, and long-term outcomes were analyzed.

**Results:** The majority of patients were male (70%) with a mean age of 42.5 years. Falls (40%) and motor vehicle accidents (30%) were the most common mechanisms of injury. Concussions (40%) and mild to moderate head injuries predominated. Surgical interventions, including craniotomy (60%) and intracranial pressure monitoring (80%), were performed in a subset of patients. Complications such as infection (40%) and hydrocephalus (60%) were observed postoperatively. Most patients achieved good recovery (70%) at discharge, while some experienced moderate (20%) or severe disability (8%).

**Conclusion:** Our study provides valuable insights into the management of head injury patients, emphasizing the importance of prompt assessment, appropriate interventions, and comprehensive rehabilitation. Targeted prevention strategies and further research are needed to optimize care and outcomes for this population.

**Keywords:** Head injury, demographic characteristics, surgical interventions, outcomes.

### Introduction:

Head injuries pose a significant challenge in the field of medicine, often presenting complex management scenarios that require a multidisciplinary approach. From mild concussions to severe traumatic brain injuries (TBIs), these cases vary widely in severity and etiology, demanding careful assessment and treatment strategies. The study of head injury management is paramount due to its potential for long-term neurological consequences and its impact on patients' quality of life.<sup>1,2,3</sup>

Understanding the nuances of head injury management involves grasping various facets, including initial assessment, diagnostic imaging, neurosurgical interventions, and rehabilitation protocols. Each stage requires precise decision-making to optimize patient outcomes and minimize complications. Moreover, the management of head injury cases extends beyond medical intervention, encompassing psychosocial support for patients and their families.<sup>4</sup>

Furthermore, advancements in medical technology and research have significantly influenced the approach to head injury management. From improved diagnostic tools such as advanced neuroimaging techniques to innovative surgical procedures, the landscape of head injury care continues to evolve. Consequently, ongoing

research and education are essential to refining treatment protocols and enhancing patient care in this critical area.<sup>5</sup>

In this study, we focus into the complexities of managing head injury cases, examining current practices, challenges, and emerging trends. By exploring various aspects of head injury management, we aim to contribute to the knowledge base that guides clinical practice and improves patient outcomes.

**Methodology:**

A retrospective study was conducted over a period of one year to investigate the management of head injury cases at our Hospital. The study included a sample size of 50 patients who were admitted to the hospital with various types and severities of head injuries for last one year.

Data collection involved reviewing electronic medical records, including admission notes, imaging reports, surgical records, and rehabilitation progress notes. Information regarding patient demographics, injury characteristics, initial management strategies, surgical interventions, complications, and long-term outcomes was extracted from these records.

The inclusion criteria for the study comprised patients of all ages who were diagnosed with head injuries, ranging from mild concussions to severe traumatic brain injuries, and were admitted to the hospital for further management. Patients with incomplete medical records or those transferred from other facilities mid-treatment were excluded from the analysis.

Statistical analysis was performed using appropriate measures to identify trends, patterns, and outcomes in head injury management. Descriptive statistics such as frequencies, means, and standard deviations were calculated for demographic and clinical variables. Additionally, inferential statistics such as chi-square tests and t-tests were employed to assess associations between different variables and to determine the effectiveness of various treatment modalities.

**Results:**

**Table 1a: Age Distribution of Head Injury Patients**

Age (years)	Frequency
18-30	10
31-45	20
46-60	15
61-75	5

**Table 1b: Gender Distribution of Head Injury Patients**

Gender	Frequency	Percentage
Male	35	70%
Female	15	30%
Other	0	0%

**Table 1c: Mechanism of Injury in Head Injury Patients**

Mechanism of Injury	Frequency	Percentage
Fall	20	40%
Motor Vehicle	15	30%
Assault	10	20%
Other	5	10%

**Table 2: Injury Characteristics and Initial Management**

Variable	Frequency	Percentage
Glasgow Coma Scale (GCS)		
Mild (13-15)	25	50%
Moderate (9-12)	15	30%
Severe (3-8)	10	20%
Type of Injury		
Concussion	20	40%
Contusion	15	30%
Intracranial Hemorrhage	10	20%
Skull Fracture	5	10%
Initial Management		
Observation	30	60%
Pharmacological	15	30%
Surgical Intervention	5	10%

**Table 3: Surgical Interventions and Complications**

Surgical Intervention	Frequency	Percentage
Craniotomy	3	60%
Decompressive Craniectomy	1	20%
Intracranial Pressure Monitoring	4	80%
Ventriculostomy	2	40%
Complications		
Infection	2	40%
Hemorrhage	1	20%
Hydrocephalus	3	60%
Neurological Deficits	2	40%

**Table 4: Long-term Outcomes and Rehabilitation**

Outcome	Frequency	Percentage
Discharge Disposition		
Home	30	60%
Rehabilitation Facility	15	30%
Long-term Care Facility	5	10%
Glasgow Outcome Scale (GOS)		
Good Recovery (GOS 4-5)	35	70%
Moderate Disability (GOS 3)	10	20%
Severe Disability (GOS 2)	4	8%
Vegetative State (GOS 1)	1	2%

**Discussion**

The findings of this study provide valuable insights into the demographic characteristics, injury patterns, management strategies, surgical interventions, complications, and long-term outcomes associated with head injury patients. Understanding these aspects is crucial for optimizing patient care and improving clinical outcomes in this population.<sup>6</sup>

**Demographic Characteristics**

The demographic profile of head injury patients in our study reflects a wide age range, with a mean age of 42.5 years. The majority of patients were male (70%), consistent with existing literature suggesting that males are more prone to head injuries due to higher rates of risk-taking behavior and occupational hazards. The most common mechanisms of injury were falls (40%) and motor vehicle accidents (30%). These findings underscore the need for targeted prevention strategies, especially among older adults susceptible to falls and young adults involved in motor vehicle accidents.<sup>7</sup>

**Injury Characteristics and Initial Management**

The Glasgow Coma Scale (GCS) distribution revealed a predominance of mild to moderate head injuries, with 50% of patients presenting with mild GCS scores (13-15) and 30% with moderate scores (9-12). Concussions were the most prevalent type of injury (40%), followed by contusions (30%) and intracranial hemorrhages (20%). Initial management strategies primarily involved observation (60%) and pharmacological interventions (30%), indicating that many patients presented with mild symptoms or stable conditions upon admission.

**Surgical Interventions and Complications**

Surgical interventions were necessary in a subset of patients, with craniotomy being the most common procedure (60%), followed by decompressive craniectomy (20%) and intracranial pressure monitoring (80%). Ventriculostomy was performed in 40% of cases to manage intracranial pressure. Complications such as infection (40%), hemorrhage (20%), hydrocephalus (60%), and neurological deficits (40%) were observed postoperatively. These findings highlight the complexity of managing head injuries and the importance of closely monitoring patients for potential complications, particularly those undergoing surgical intervention.<sup>9,10</sup>

**Long-term Outcomes and Rehabilitation**

The majority of patients were discharged home (60%) after treatment, while 30% required further rehabilitation in specialized facilities. A small percentage of patients (10%) required long-term care placement, indicating

significant functional impairments or ongoing medical needs. The Glasgow Outcome Scale (GOS) assessment revealed favorable outcomes, with 70% of patients achieving good recovery (GOS 4-5). However, a notable proportion of patients experienced moderate disability (20%) or severe disability (8%), emphasizing the diverse spectrum of outcomes following head injury.

### **Clinical Significance**

The findings of this study have several implications for clinical practice. Firstly, the predominance of mild to moderate head injuries underscores the importance of early recognition and appropriate management to prevent deterioration and minimize long-term sequelae. Close observation and neuroimaging are essential for accurately assessing the severity of injury and guiding treatment decisions.

Secondly, the high rate of surgical interventions and associated complications highlights the critical role of neurosurgical expertise in managing severe head injuries. Neurosurgical interventions, including craniotomy and decompressive craniectomy, are essential for relieving intracranial pressure and preventing secondary brain injury. However, these procedures carry inherent risks, such as infection and hemorrhage, necessitating vigilant postoperative monitoring and prompt intervention if complications arise.

The favorable long-term outcomes observed in the majority of patients underscore the importance of comprehensive rehabilitation and support services. Rehabilitation programs tailored to individual needs are crucial for optimizing functional recovery and enhancing quality of life post-injury. Furthermore, the transition from acute care to rehabilitation and long-term care facilities should be coordinated to ensure continuity of care and maximize outcomes.

The demographic and injury patterns identified in this study highlight the need for targeted prevention strategies. Falls and motor vehicle accidents are leading causes of head injury, particularly among older adults and young individuals, respectively. Public health initiatives aimed at reducing these risk factors, such as falls prevention programs for the elderly and traffic safety campaigns for young drivers, are essential for mitigating the burden of head injuries on individuals and healthcare systems.

### **Limitations and Future Directions**

Several limitations should be acknowledged when interpreting the findings of this study. Firstly, the retrospective nature of the study may have introduced selection bias and limited the availability of comprehensive data. Secondly, the sample size of 50 patients from a single institution may not be representative of the broader population, warranting validation in larger, multi-center studies. Additionally, the one-year duration of the study may not capture long-term outcomes beyond the immediate post-injury period.

Future research should focus on prospective studies with larger sample sizes to further elucidate the predictors of outcomes and identify optimal management strategies for different subgroups of head injury patients. Longitudinal studies tracking patients over extended periods are needed to assess the trajectory of recovery and evaluate the effectiveness of rehabilitation interventions. Furthermore, comparative studies evaluating the cost-effectiveness of different treatment modalities and the impact of preventive measures on reducing the incidence of head injuries are warranted.

### **Conclusion:**

In conclusion, our study provides valuable insights into the management of head injury patients, highlighting the importance of timely assessment, appropriate interventions, and comprehensive rehabilitation in achieving favorable outcomes. By addressing the demographic and injury patterns identified and implementing targeted

prevention and treatment strategies, healthcare providers can improve the quality of care and long-term prognosis for individuals affected by head injuries.

#### References:

1. Dash HH, Chavali S. Management of traumatic brain injury patients. *Korean J Anesthesiol.* 2018 Feb;71(1):12-21
2. Carney N, Totten AM, O'Reilly C, Ullman JS, Hawryluk GW, Bell MJ, et al. Guidelines for the management of severe traumatic brain injury, fourth edition. *Neurosurgery.* 2017;80:6–15.
3. Bhagat H, Narang R, Sharma D, Dash HH, Chauhan H. ST elevation--an indication of reversible neurogenic myocardial dysfunction in patients with head injury. *Ann Card Anaesth.* 2009;12:149–151.
4. Davison DL, Terek M, Chawla LS. Neurogenic pulmonary edema. *Crit Care.* 2012;16:212.
5. Dash HH. Prehospital care of head injured patients. *Neurol India.* 2008;56:415–419.
6. Chesnut RM, Marshall LF, Klauber MR, Blunt BA, Baldwin N, Eisenberg HM, et al. The role of secondary brain injury in determining outcome from severe head injury. *J Trauma.* 1993;34:216–222.
7. Spaite DW, Bobrow BJ, Stolz U, Sherrill D, Chikani V, Barnhart B, et al. Evaluation of the impact of implementing the emergency medical services traumatic brain injury guidelines in Arizona: the excellence in prehospital injury care (EPIC) study methodology. *Acad Emerg Med.* 2014;21:818–830.
8. Teasdale G, Jennett B. Assessment of coma and impaired consciousness. A practical scale. *Lancet.* 1974;2:81–84.
9. Wijdicks EF, Bamlet WR, Maramattom BV, Manno EM, McClelland RL. Validation of a new coma scale: the FOUR score. *Ann Neurol.* 2005;58:585–593.
10. Lin K, Dulebohn SC. *Rancho Los Amigos.* Treasure Island (FL): StatPearls Publishing; 2017.