

**Original article:**

## **Analysis of Emergency Department Management of Mild Traumatic Brain Injury at Tertiary Care Hospital**

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### **ABSTRACT**

**Background:** The present study was conducted for Emergency Department Management of patients with Mild Traumatic Brain Injury (TBI).

**Materials & Methods:** The present study was conducted in the Department of Neurosurgery, Government Medical College, Amritsar, Punjab (India) for Emergency Department Management of patients with Mild Traumatic Brain Injury. A total of 50 patients who reported to the emergency department with traumatic brain injury were enrolled. Complete demographic details of all the patients were obtained. Data of only those patients meeting the International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9) definition of isolated mild TBI were analyzed. The pattern of management of these patients was recorded separately. All the results were recorded and analyzed using SPSS software.

**Results:** Mean age of the patients was 46.2 years. CT scan and MRI were done in 96 percent and 82 percent of the patients respectively. Blood alcohol level testing was done in 36 percent of the patients. Primary wound care was done in 100 percent of the patients while iv fluids were administered in 90 percent of the patients. ET intubation was done in 40 percent of the patients. Analgesics were given to 100 percent of the patients. 66 percent of the patients were recalled on follow-up after discharge.

**Conclusion:** From the above results, it can be concluded that substantial emergency department resources are devoted to the care of mild TBI. Emergency management for mild TBI could be improved through the development of guidelines specific for mild TBI.

**Key words:** Traumatic Brain Injury, Emergency Department.

### **INTRODUCTION**

Traumatic brain injury (TBI) is a universal public health problem. A recent review of epidemiological studies in Europe suggests an incidence of 235 hospitalized cases (including fatalities) per 100,000 population. In the US, the incidence is estimated at 150 per 100,000 population. Less data is available from other regions of the world, but TBI is acknowledged as a significant problem worldwide. Of note is that the incidence rates are calculated from hospitalized cases only, and do not include injured individuals who do not seek or have access to care.<sup>1, 2</sup> Thus, the actual incidence of injury is probably 3 to 4-fold larger than the quoted numbers. Most studies suggest that the incidence rates for TBI are greatest in the second and third decades of life, with a secondary increase in the elderly stemming from falls. Males are more likely to suffer a TBI than females.<sup>3, 4</sup>

Smits et al described a CT scan protocol for head trauma based on an evaluation of 3181 patients. Pre-existing protocols based on signs and symptoms were used, and a high sensitivity and specificity for surgical and nonsurgical intracranial lesions were subsequently found. Therefore, the use of patients' signs and symptoms as predictors of such lesions showed a high sensitivity and specificity. Patients who scored 15 on GCS and were either sent for immediate CT scan or only stayed under medical observation, progress similarly. However, the early CT scan is the best cost-benefit strategy, because when this is normal during the patient's admission, it suggests a good prognosis without neurological complications.<sup>5,6</sup> Hence; the present study was conducted for Emergency Department Management of patients with Mild Traumatic Brain Injury.

## MATERIALS & METHODS

The present study was conducted in the Department of Neurosurgery, Government Medical College, Amritsar, Punjab (India) for Emergency Department Management of patients with Mild Traumatic Brain Injury. A total of 50 patients who reported to emergency department with traumatic brain injury were enrolled. Complete demographic details of all the patients were obtained. Data of only those patients meeting the International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9) definition of isolated mild TBI were analyzed. Pattern of management of these patients was recorded separately. All the results were recorded and analyzed using SPSS software.

**Table 1: Demographic data**

Demographic data	Number of patients	Percentage
Males	36	72
Females	14	28
Mean age (years)	46.2	

**Table 2: Diagnostic testing done**

Emergency department care variables	Number of patients	Percentage
Mental status examination	50	100
CT Scan	48	96
MRI	41	82
Other X-rays	21	42
Blood alcohol levels testing	18	36
Other blood test	31	62

**Table 3: Emergency department procedures**

Emergency department care procedures	Number of patients	Percentage
Wound care	50	100
IV fluids	45	90
ET Intubation	21	42
Analgesics	50	100
Recalled on follow-up after discharge	33	66

## RESULTS

Mean age of the patients was 46.2 years. Majority proportion of patients were males. On entering the emergency department, mental status examination was done in 100 percent of the patients. CT scan and MRI was done in 96 percent and 82 percent of the patients respectively. Blood alcohol level testing was done in 36 percent of the patients. Primary wound care was done in 100 percent of the patients while iv fluids were administered in 90 percent of the patients. ET intubation was done in 40 percent of the patients. Analgesics were given in 100 percent of the patients. 66 percent of the patients were recalled on follow-up after discharge.

## DISCUSSION

Traumatic brain injury is the leading cause of disability in people under 40, severely disabling 150-200 people per million annually. Neuropsychiatric sequelae outstrip the neurophysical (such as ataxia or incontinence) as the major cause of disability. Problems with memory, attention, executive function, behavioural control, and regulation of mood, associated with injury to the frontal and temporal lobes, are particularly troublesome. The vast majority of recovery after traumatic brain injury takes place in the two years after injury; after this the brain injured patient faces an uncertain future. In some patient's further improvement is seen even as late as 5-10 years after injury. Thus, some long-term studies, unfortunately often weakened by low rates of follow-up, show surprisingly good outcomes.<sup>7-9</sup> Hence; the present study was conducted for Emergency Department Management of patients with Mild Traumatic Brain Injury.

Mean age of the patients was 46.2 years. Majority proportion of patients were males. On entering the emergency department, mental status examination was done in 100 percent of the patients. CT scan and MRI was done in 96 percent and 82 percent of the patients respectively. Blood alcohol level testing was done in 36 percent of the patients. Primary wound care was done in 100 percent of the patients while iv fluids were administered in 90 percent of the patients. ET intubation was done in 40 percent of the patients. Our results were in concordance with the results obtained by previous authors who also reported similar findings. In a previous study, Bazarian JJ et al describe the emergency department (ED) management of isolated mild traumatic brain injury (TBI) in the USA and to examine variation in care across age and insurance types. A secondary analysis of ED visits for isolated mild TBI in the National Hospital Ambulatory Medical Care Survey 1998–2000 was performed. Mild TBI was defined by International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9) codes for skull fracture, concussion, intracranial injury (unspecified), and head injury (unspecified). Available ED care variables were analysed by patient age and insurance categories using multivariate logistic regression. The incidence of isolated mild TBI cases attending ED was 153296 per year, or 56.4/100000 people. Of the patients with isolated mild TBI, 44.3% underwent computed tomography, 23.9% underwent other non-extremity, non-chest x rays, 17.1% received wound care and 14.1% received intravenous fluids. However, only 43.8% had an assessment of pain. Of those with documented pain, only 45.5% received analgesics in the ED. Nearly 38% were discharged without recommendations for specific follow up. Several aspects of ED care varied by age but not by insurance type. Substantial ED resources are devoted to the care of isolated mild TBI.<sup>10</sup>

Analgesics were given in 100 percent of the patients. 66 percent of the patients were recalled on follow-up after discharge. Although many physicians are familiar with severe TBI and its management, mild TBI comprises

70%–80% of all such injuries. The deficits produced by mild TBI are frequently more subtle, less often recognized, and more contentiously debated than are those resulting from severe TBI. Given the large number of persons that experience mild TBI each year, it is indeed fortunate that the majority of these individuals recover fully within the first year following TBI. However, a nontrivial minority of persons with mild TBI, with estimates ranging between 1% and 20%.<sup>11,12</sup>

## CONCLUSION

From the above results, it can be concluded that substantial emergency department resources are devoted to the care of mild TBI. Emergency management for mild TBI could be improved through the development of guidelines specific for mild TBI.

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