

## DEMOGRAPHIC PROFILE, CLINICAL PRESENTATION, MANAGEMENT OPTIONS IN CRANIO-CEREBRAL TRAUMA: An experience of a rural hospital in Central India

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### ABSTRACT

**Objective:** Head injury is a common condition that can result in either obvious neurological sequelae or imaging findings. The purpose of this study was to find out the epidemiology, clinical presentation and management options in patients with head injury at a rural centre of central India.

**Methodology:** In this retrospective study, data of all patients who attended the Department of Surgery, ABMH, Sawangi (Meghe), Wardha for cranio-cerebral trauma were included and a total of 200 patients were reviewed. Epidemiological and clinical details including investigations were noted for all the patients. Management offered to the patients was studied and outcome was analyzed.

**Results:** This study enrolled 200 patients. Male were more common than female. Young patients were commonly affected. Common presenting features were loss of consciousness and vomiting. Mild head injury was most common. Majority of patients were treated conservatively and indications for surgery were compound depressed fractures and significant intracranial haematomas.

**Conclusions:** Cranio-cerebral injury patterns in developing countries particularly in rural area are no different from developed countries and knowledge of its causative factors, management and potential complications will help to plan active interventions that may improve outcome. It will also help in developing preventive measures.

**KEY WORDS:** Cranio-cerebral trauma, Neurological injury, Head injury, Trauma, Injury.

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## INTRODUCTION

Traumatic brain injury (TBI) is a common and potentially devastating clinical problem substantial financial burden on resources.<sup>1</sup> Head trauma is the cause of death in more than 50% of trauma patients.<sup>2</sup> It accounts for 500000 emergency visits 95,000 hospital admission and 7,000 deaths per year in United States.<sup>3,4</sup> In order to prevent head injuries and effective prevention of head injuries there is a need to identify causes and to implement strategies to reduce their occurrence.<sup>5</sup>

## PATIENTS AND METHODS

This study was a retrospective review performed at Acharya Binova Bhawe Rural

Hospital, Sawangi (Meghe). This is a hospital situated in rural area of central India. The period of study was from July 2002 to December 2005. A total of 200 consecutive patients who sustained cranio-cerebral injuries were included in this study. Patients' charts were reviewed and epidemiological (age, sex and mode of injury) and clinical details were noted for all the patients in a pre-designed pro-forma. Data was analyzed according to age, sex, cause of injury, mechanism of injury, type and location of the injuries and neurologic injuries. Appropriate views of skull X-Rays were performed in all patients and inpatients with impaired consciousness, neurological signs or clinical signs of a basal skull fracture, an initial CT scan was also performed. Patients were considered to have a skull or facial fracture on the basis of a plain radiograph or a CT scan evaluated by a radiologist. Outcome was analyzed according to the Glasgow outcome scale.<sup>6</sup>

## RESULTS

Total 200 patients were admitted with cranio-cerebral trauma and their mean age was 32.64 years (range, 4 years to 76 years). Majority of the patients were young adults (Table-I). There were 173 males and 27 female (ratio of 6.4:1). Most common cause of injury was motor vehicular accidents 164 (82%) followed by fall from height 19 (9.5%) and assault 15 (7.5%). Headache and vomiting were most common clinical features followed by loss of consciences. Closed head injury was the most common neurological injury followed by skull fractures. Associated clinical findings sug-

Table-I: Age distribution

Age	No.
0-10	7
11-20	19
21-30	52
31-40	66
41-50	36
51-60	8
61-70	9
71-80	3



Fig-1: CT scan of a patient showing Battle's sign

gestive of basal skull fractures were nasal bleed and/or ear bleed, ecchymosis over mastoid (Battle's sign) (Figure-1) and CSF otorrhoea/rhinorrhoea (Table-II). Seventeen patients (8.5%) had history of post-traumatic seizures. Ninety two patients had mild head injuries, seventy six had moderate and thirty two had severe head injuries. Cerebral contusions were the most common findings on CT scan followed by skull fracture, SDH, EDH and ICH respectively (Table-III). CT scan was normal in 26 cases. Details of associated injuries is shown in (Table-IV). There was no mortality in patients with minor head injuries. Majority of the patients were treated conservatively (81.8%) and only 18.2% cases required surgical intervention. Indications for surgery were intracranial haematomas, compound depressed fractures, closed fractures with significant? Majority of the patients improved (86.7%) in this series. Nine patients left against medical advice either due to financial constraints or poor prognosis. Mortality was mainly seen in patients with severe head injuries.

Table-II: Signs of fracture base skull

Signs	No.
Nasal bleeding	64
Ear bleeding	18
Ear and nasal bleed	14
Ecchymosis over mastoid	4
CSF otorrhoea/Rhinorrhoea	9

Table-III: CT scan findings.

<i>Lesion</i>	<i>No.</i>
Cerebral contusions	84
Fracture	24
SDH	22
EDH	16
ICH	8
Normal	26

## DISCUSSION

In this study males were more affected than females. It has been reported that up to two-thirds of head traumas is experienced by males.<sup>7</sup> The most frequent causes are motor vehicle accidents, bicycle accidents, or pedestrian-vehicle accidents. Other causes reported include falls, violence-related injuries.<sup>1,7-9</sup> The incidence of post-traumatic seizures was 8.5% in our study. In a population-based study of TBI in Minnesota, the 30-year cumulative incidence for post-traumatic seizures in patients with non-fatal TBI without prior history of epilepsy or subsequent trauma was 2.1% for patients with mild TBI, 4.2% for patients with moderate TBI, and up to 16.7% for those with severe TBI.<sup>10,11</sup> In our series there was low threshold for CT scan in all groups of patients and indications for CT scan were loss of consciousness, vomiting and headache. In our study incidence of normal CT scan was low.<sup>12,13</sup> Nevertheless, current practice in the UK is that CT scan is reserved for patients considered to be at high risk of intracranial complications, whereas in the USA, CT scan is performed in 75–100% of patients with a normal GCS and loss of consciousness.<sup>14</sup> However, a normal CT scan does not mean that everything is alright as the patient may be suffering from diffuse axonal injury.<sup>15,16</sup> As in the preset series up to 80% of patients suffer with mild cerebral injuries.<sup>4</sup> However severe brain injury is a major predictor of unfavorable outcome in patients with multiple injuries, independent of the presence and severity of extracranial lesions.<sup>17,18</sup> In our series also mortality was mainly seen in severe head injury patients. However predicting outcome in patients with severe head

Table-IV: Associated injuries

<i>Associated injuries</i>	<i>No.</i>
Rib fracture	20
Long bone fracture	22
Abdominal trauma	5
Maxillofacial fracture	26

trauma remains a challenging task and generates abundant controversy. Apart from low Glasgow Coma Scale (GCS) several clinical parameters, such as old age, abnormal pupillary reaction, arterial hypotension and hypoxia with subsequent metabolic acidosis, are evaluated prior to and/or at admission and are considered independent predictors of mortality in patients with traumatic brain injury.<sup>19-23s</sup>

## CONCLUSION

Being a retrospective review this study work on the assumption that the history and clinical records accurately represents the events. This study also supports that injury patterns in developing countries particularly in rural area are no different from developed countries and needs to follow similar preventive and counseling measures. There is a need to identify the pattern and exact figures of head injuries to formulate the preventive strategies and to plan the management protocols.

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