Original Article

# Head Injuries with Skull Fracture and Intracranial Lesion- an Analysis of Admitted Patients in Rajshahi Medical College

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***Abstract***

*Seven hundred nineteen patients were admitted in Neurosurgery department, Rajshahi medical college and hospital during the period of 2 months. Among them 74% were male and 26% were female, 15-45 years age group is the most affected age group. 82% were with mild head injury, 7% moderate and 9% were with severe head injury. Skull fracture were present in 19% and intracranial lesion present in 14% of patients.88% of patients were discharged after improvement. 3% were died in the hospital and rest were either referred or discharged on request or risk bond.*

## Introduction

Care of the head injured patients forms an important part of a neurosurgeon's work in all countries specially in developing countries, where widespread facilities for such care may be meager. With increasing industrialization and more rapid methods of transport, incidence and severity of head injuries are increasing[1].In our country social and political unrest is another cause of increasing head injuries. Injuries to the head are not of similar magnitude. Head injuries can be categorized according to the GCS (Glasgow Coma Scale) into mild(GCS 13-15), moderate(GCS 9-12) and severe(GCS 3-8). Injuries may occur in the form of injuries to scalp, skull fracture and/or intracranial injuries. Intracranial lesions may be EDH (Extradural hematoma) (Fig. 1), SDH (Subdural hematoma) (Fig. 2), Cerebral contusion, Diffuse axonal injury, Pneumocephalus, Subarachnoid hemorrhage etc. Skull fracture may be simple or compound. Skull fracture can be diagnosed by X-ray and CT scan (Fig. 3.a.b). Intracranial lesions are diagnosed by CT scan. MRI usually not done for traumatic brain injuries unless otherwise indicated.

Fig 1: CT scan showing EDH in Rt. Parietal region

Fig 2: CT scan showing acute SDH in Lt. fronto-parieto-occipital

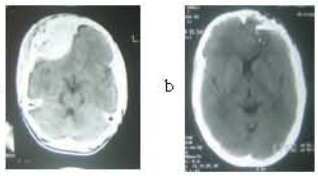

Fig 3: CT scan showing a) depressed skull fracture with EDH on Rt. Frontal region b) depressed fracture over Lt frontal region.

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Factors to consider when determining need of CT in patients with head injury[2] :

Indications for urgent CT scan include the following:

- Evidence of skull fracture—basal, depressed, or open
- Abnormal results of neurologic examination
- Seizure
- Vomiting > 1 time
- High-risk mechanism (e.g., ejection from vehicle; pedestrian or cyclist vs. automobile)
- Decreasing GCS score or persistently decreased GCS score of < 15

Indications for lower threshold for CT scan include the following:

- Age > 60 y
- Persistent anterograde amnesia
- Retrograde amnesia > 30 min
- Coagulopathy
- Fall > 5 stairs or > 3 ft
- Intoxication (examination unreliable)
- LOC(Loss of consciousness) > 30 min
- Mechanism and location of injury
- Social factors (e.g., abusive situation at home, language barriers preclude accurate history)

## Materials and Methods

This study was done on the patients with head injury admitted into the neurosurgery ward in RMCH, Rajshahi during the period of two months (1st April '09 to 30 May '09). All the patients were first assessed clinically by taking history and physical examination and clinical parameters were recorded. Levels of consciousness were assessed using Glasgow ComaScale (GCS). Those patients needs X-ray or CT-scan following the standard indications, were advised for and findings were recorded as fracture either present or absent and intracranial lesion (hemorrhage or contusion) either present or absent. Immediate computerized tomography (CT) scans were performed in patients with Glasgow Coma Scale (GCS) scores of less than 15, in those with radiological and/or clinical evidence of skull fracture, and whenever clinically indicated.

Outcomes were recorded as a) Discharged after improvement b) Referred to a higher centre c) Discharged on request or on risk bond of those patients who were not still out of risk d) Absconded or e) Died. Those patients were referred to a higher center, who needs intensive care unit support or patient's party wishes to go to a higher centre.

All the patients with head injury were included in this study. Data were collected in a data collection sheet and calculation done by SPSS.

## Results

During the period of two months 719 patients were admitted with head injury through emergency department. Among them 529 were male and 190 were female. Age ranges from 7 months to 70 years. Patients below 15 years were 131 (18%), 15-45 years were 465 (65%), 45-60 years were 95 (13%) and above 60 years were 28 (4%). Maximum affected age group was 15-45 years.

Causes of injuries were assault 329 (46%), road traffic accident (RTA) 232 (32%), fall 128 (18%) and others were 30 (4%). Assault was the commonest cause of head injury followed by RTA. Fall was also a significant cause.

Headache was the commonest presenting feature and was present in 647 (90%) cases. 57 (08%) patients could not complained of due to depressed level of consciousness or so young to complain. Headache was absent in 15 (02%) cases. Vomiting was present in 288 (40%) cases and absent in 60% cases. Pupillary changes were found in 53 (7.5%) cases.

Table I: Glasgow coma scale (GCS) on admission

| GCS | No | Percentage (%) |
|---|---|---|
| 3-8 | 63 | 09 |
| 9-12 | 48 | 07 |
| 13-15 | 594 | 82 |
| Can't be assessed | 14 | 02 |

Most (82%) of the patients were admitted with mild head injury i.e. GCS 13-15. 7% were with moderate head injury (GCS 9-12) and 9% patients were with severe head injury (GCS 3-8).

Table II: Presence of skull fracture

| Skull fracture | No. | Percentage (%) |
|---|---|---|
| Present | 135 | 19 |
| Absent | 441 | 61 |
| Not assessed (X-ray or CT not done) | 143 | 20 |
| Total | 719 | 100 |

Skull X-ray done in 576 (80%) patients and fracture were present in only 135 (19%) cases. 20% patients did not required skull radiograph on clinical ground.

Table III: Presence of intracranial lesion

| Intracranial hemorrhage or lesion | No. | Percentage (%) |
|---|---|---|
| Present | 101 | 14 |
| Absent | 85 | 12 |
| Not assessed (CT not done) | 533 | 74 |
| Total | 719 | 100 |

26% of patients required CT scan of head and of them 14% had intracranial lesions in the form of EDH (Extradural hematoma), SDH (Subdural hematoma), hemorrhagic or non-hemorrhagic contusion, pneumocephalus and DAI (diffuse axonal injury). Most of the extradural hematoma cases and few subdural hematoma and hemorrhagic contusion cases underwent operative treatment.

Table IV: Outcome of treatment of head injury patients

| Outcome | No. | Percentage (%) |
|---|---|---|
| Discharged after improvement | 637 | 88 |
| Referred to higher center | 18 | 03 |
| DOR/DORB | 16 | 02 |
| Absconded | 29 | 04 |
| Died | 19 | 03 |
| Total | 719 | 100 |

*DOR- Discharged on request, DORB- Discharged on risk bond

Most (88%) of the patients were improved and then discharged. 3% were referred to a higher center for better management or on request of the party, 2% were discharged on request or on risk bond who were still not out of danger or required in hospital management. 4% patients were absconded and most of them were the victims of assault. In hospital mortality was 3%.

## Discussion

Traumatic brain injury (TBI, also called intracranial injury) occurs when an external force traumatically injures the brain. Head injury usually refers to TBI, but is a broader category because it can involve damage to structures other than the brain, such as the scalp and skull[3].

Head injuries can be classified into mild, moderate, and severe categories[4]. The Glasgow Coma Scale (GCS), the most commonly used system for classifying TBI severity, grades a person's level of consciousness on a scale of 3–15 based on verbal, motor, and eye-opening reactions to stimuli. It is generally agreed that a TBI with a GCS of 13 or above is mild, 9–12 is moderate, and 8 or below is severe[5].

A World Health Organization study estimated that between 70 and 90% of head injuries that receive treatment are mild,[6] and a US study found that moderate and severe injuries each account for 10% of TBIs, with the rest mild[7]. Our study showed 82% were mild, 7% moderate and 9% cases were severe head injuries.

The most common causes of TBI include violence, transportation accidents, construction, and sports[8]. In the US, falls account for 28% of TBI, motor vehicle (MV) accidents for 20%, being struck by an object for 19%, violence for 11%, and non-MV bicycle accidents for 3%[9]. In this study assault (46%) is the commonest cause followed by RTA (32%).

In one study conducted by Kwan-Hon Chan 1990 in Hong

Kong, of the 418 admitted patients, only 26 had skull fractures; 13 of these developed ICH. Four patients without skull fracture developed diffuse brain swelling. The remaining 401 patients were discharged after observation periods of up to 48 hours[10].

Four hundred two cases of blunt head injury admitted to Chikamori Hospital during the period from January 1980 through May 1983 were examined by plain craniogram and computerized tomography (CT) scan on admission. Skull fracture was observed in 82 (62%) of 132 child cases and in 162 (60%) of 270 adult cases. Intracranial complications were observed in 29 (22%) child cases and in 135 (50%) adult cases[11].

In our study 19% patients had skull fracture and 14% had intracranial lesion.

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