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## Evaluation of cases of head injury in patients admitted to emergency using CT scan

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### Abstract

**Background:** Traumatic brain injury (TBI) is one of the most devastating types of injury. The present study was conducted to evaluate cases of head injury with CT scan.

**Materials & Methods:** The present study was conducted on 225 patients of head injury of both genders. All patients underwent CT scan using Toshiba Aquillion CT scanner (16 slice). Both the bone and soft tissue windows were viewed, and images were reformatted into sagittal, coronal, and oblique planes.

**Results:** Out of 225 patients, males were 125 and females were 100. Reason of head injury was road traffic accident in 170, fall in 38, assault in 12 and gun shot in 5. The difference was significant ( $P < 0.05$ ). Common CT findings were fracture in 120, subdural hemorrhage in 65, epidural hemorrhage in 32, subarachnoid hemorrhage in 46, contusion in 24, hematoma in 72, cerebral edema in 35, sinus collection in 44 and pneumocranium in 26. The difference was significant ( $P < 0.05$ ).

**Conclusion:** Maximum cases were due to road traffic accidents and common CT finding was cranium fracture.

**Keywords:** CT scan, contusion, head

### Introduction

It remains the most common cause of death following trauma, with particularly high mortality and morbidity in low- and middle- income countries (LMIC). Traumatic brain injury (TBI) is one of the most devastating types of injury [1]. Head injury according to WHO will surpass many diseases as the major cause of death and disability by the year 2020. As per report by the ministry of road transport, Government of India (2007) 1.4 lakhs road accident happened in 2007 with 40,612 people killed and 1.5 lakhs people injured. The general incidence of traumatic brain injury (TBI) in developed countries is approximately 200/100,000/year [2].

It affects all ages; however majority of road traffic injuries (RTI) occurs in young adults of productive age group. Hence, India is leading the world in fatalities due to road accidents. TBI is also associated with significant socioeconomic losses in India as well as in other developing countries [3].

Due to rapid surge in urbanization, motorization and economical liberation, many Asian countries have an increased risk for TBI. Similarly in many low and middle income countries (LMIC), non-communicable disease including injuries is becoming a leading cause of mortality and morbidity. LMIC face a higher preponderance of risk factors for TBI yet often do not have the efficient health care capacity to deal with the associated health outcomes [4]. The present study was conducted to evaluate cases of head injury with CT scan.

### Materials and Methods

The present study was conducted in the department of Radiodiagnosis. It comprised of 225 patients of head injury of both genders. Patients with congenital abnormalities of the head and those whose fall or injury were secondary to stroke were excluded from the study. All were informed regarding the study and written consent was obtained from family members. Ethical clearance was taken prior to the study.

General data such as name, age, gender etc. was recorded. All patients underwent CT scan using Toshiba Aquillion CT scanner (16 slice). Both the bone and soft tissue windows were viewed, and images were reformatted into sagittal, coronal, and oblique planes.

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The images acquired were analyzed by the experienced radiologists. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

**Results**

**Table 1:** Distribution of patients

Total- 225		
Gender	Males	Females
Number	125	100

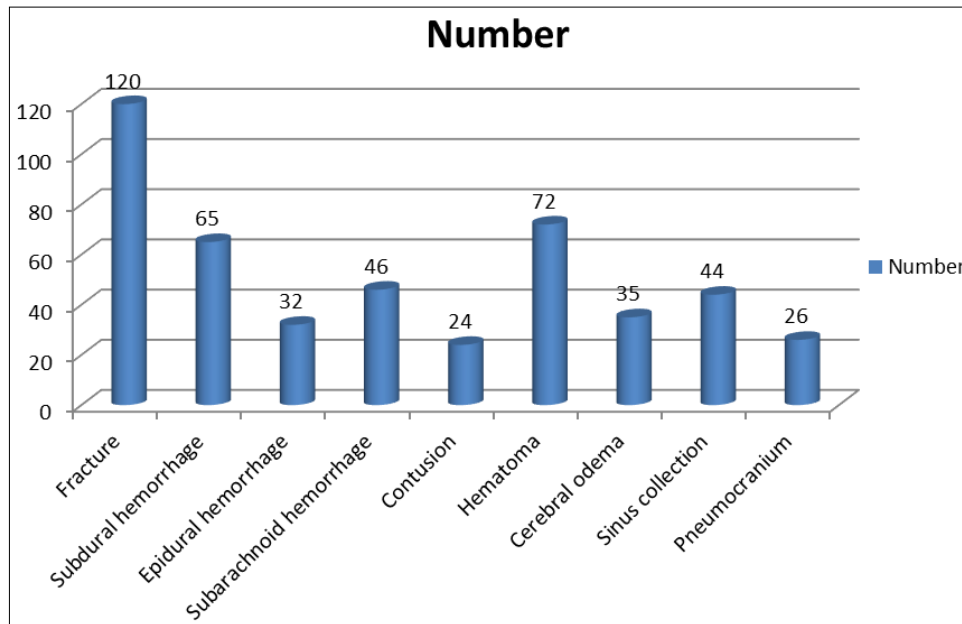
Table 1 shows that out of 225 patients, males were 125 and

females were 100.

**Table 2:** Reason of head injury

Reason	Number	P value
RTA	170	0.01
Fall	38	
Assault	12	
Gun shot	5	

Table 2 shows that reason of head injury was road traffic accident in 170, fall in 38, assault in 12 and gun shot in 5. The difference was significant ( $P < 0.05$ ).



**Graph 1:** Computed tomography findings

Graph I shows that common CT findings were fracture in 120, subdural hemorrhage in 65, epidural hemorrhage in 32, subarachnoid hemorrhage in 46, contusion in 24, hematoma in 72, cerebral odema in 35, sinus collection in 44 and pneumocranium in 26. The difference was significant ( $P < 0.05$ ).

**Discussion**

Head injury remains the most common cause of death following trauma; with particularly high mortality and morbidity in LMIC, due to poor health facilities [5]. Radiologic imaging especially CT facilitates a comprehensive diagnosis and permits early and targeted management [6]. The significant disabilities associated with TBI also places a considerable burden on health care system in these countries, therefore knowledge of the epidemiological profile of TBI and development of preventive measures to alleviate this burden are vital, particularly in the limited resources setting [7]. The present study was conducted to evaluate cases of head injury with CT scan.

In present study, out of 225 patients, males were 125 and females were 100. Reason of head injury was road traffic accident in 170, fall in 38, assault in 12 and gun shot in 5. Bahloul [8] *et al.* in their study found 791 cases with 569 (72%) males and 222 (28%) females with average age of 24 years. Fall from height was the main cause of TBI (56%) followed by road traffic injury (RTI) (36%). Majority (61%) patients reached the hospital within 6 hours of injury out of

which 27% patients were unconscious. As per Glasgow coma scale mild, moderate & severe grade of TBI was seen in 62%, 22% & 16% cases respectively. Radiological examination of other body parts revealed injuries in 11% cases. Only 11% cases required surgical management, rest was managed conservatively. Good outcome noted in 80% cases and 20% cases expired. Average duration of hospital stay was 5 days. According to multivariate analysis, the factors which correlated with poor prognosis are presence of radiological injuries to other body parts, GCS, abnormal cranial nerve examination, abnormal plantar and abnormal pupillary reflex.

Onwuchekwa *et al.* [9] in their study, the CT scans of the head of 310 consecutive patients referred specifically for evaluation of head injury were prospectively reviewed. There were 225 (72.58%) males and 85 (27.42%) females. About 44.84% of the patients were in the third and fourth decades of life. The major causes of head injury were road traffic accidents in 67.74%, falls in 14.84%, and assaults in 7.42%. Most of the patients 102 (33.0%) presented within the 1st week of injury. Cranial fractures were found in 87 (28.06%) patients. In this series, 111 (35.81%) had normal CT findings while 199 (64.19%) had abnormal CT findings. Intra-axial lesions were the most common, constituting 131 (42.26%) cases.

We found that common CT findings were fracture in 120, subdural hemorrhage in 65, epidural hemorrhage in 32, subarachnoid hemorrhage in 46, contusion in 24, hematoma in 72, cerebral odema in 35, sinus collection in 44 and in

pneumocranium 26. Akanji *et al.* [10] who found falls as the cause of head injury in 16.8% of their participants, falls constituted 14.84% of the cases of head injury in this study and was observed to be the second most common cause of head injury. Of these cases of fall in this study, 28.9% were in the first decade of life. This high incidence in pediatric age may be attributable to their involvement in high-risk activities and adventures at home and in schools. It is a call for adequate supervision of the children by adults.

### Conclusion

Authors found that maximum cases were due to road traffic accidents and common CT finding was cranium fracture.

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