



**CORRELATION OF MODERATE TO SEVERE TRAUMATIC BRAIN INJURY WITH CT IMAGING & CLINICAL OUTCOME.**

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**ABSTRACT**

In the study we have conducted prospectively on 60 patients for moderate to severe traumatic brain injury, Where it is major cause for loss of productivity and mortality. Patients who are admitted after head injury with GCS < 12 for a duration of 12 months and patients with polytrauma were excluded. All these patients were undergone CT Scan to study the intracranial bleeds, contusions, subdural hemorrhage, subarachnoid hemorrhage and midline shift etc. All these patients were evaluated clinically after 6 months with glassgow outcome score (GOS). Apart from the clinical findings, CT variables can helpful in prognostic indicators in this traumatic brain injury.

**KEYWORDS :** Traumatic brain injury (TBI), Midline shift, Subdual hemorrhage, Contusion, Subarachnoid hemorrhage.

**INTRODUCTION**

Traumatic brain injury (TBI) is one of the most frequently encountered neurological disorders causing significant morbidity and mortality (1)

Present study aims at assessing the imaging features of primary traumatic brain injury on CT scan and to evaluate those imaging features as predictors of clinical outcome in patients with TBI.

**AIMS & OBJECTIVES**

To assess the imaging features of traumatic brain injury observed in the non contrast CT scan.

To predict the clinical outcome of these patients based on their characteristic imaging findings.

**MATERIALS & METHODS**

This is a prospective & cross sectional hospital-based study. The study includes 60 patients, with GCS ≤ 12 who were admitted to the emergency department of Konaseema Institute of Medical Sciences and Research Foundation, Amalapuram, Andhra Pradesh, India during a period of 12 months. The patients were grouped based on involvement of severity of injury to the brain into two groups (moderate and severe). Clinical outcome of the patients were evaluated at 6 months according to the Glasgow outcome score (GOS).

**RESULTS**

Majority of the traumatic brain injury occurred to the patients who were in the age group of 20-40 yrs(58.3%). Motor-vehicle accidents was the chief cause of injury (78.5%), followed by fall (12.2%) and assault (9.3%).(2) The major CT imaging findings observed were (in order of frequency) subarachnoid hemorrhage (55/60), contusion (53/60), subdural hemorrhage (46/60) and midline shift (22/60). Intraventricular hemorrhage, effacement of basal cisterns, midline shift, diffuse axonal injury and herniation were significant predictors of unfavorable outcome.

**IMAGING FINDINGS**

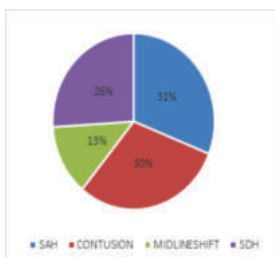


Figure 1. Axial CT images of brain showing Subarachnoid hemorrhage in left parietal region.

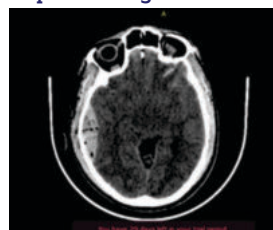


Figure 2: Axial CT images of brain showing Subarachnoid hemorrhage in right basifrontal region.

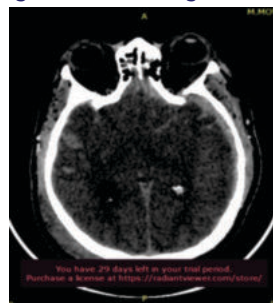


Figure 3. Axial CT images of brain showing multiple intraparenchymal hemorrhagic contusions in the right cerebral hemisphere.

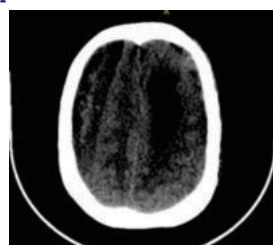
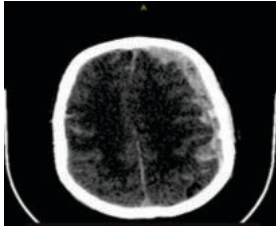
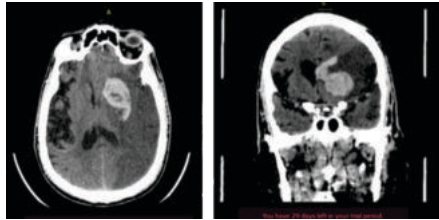


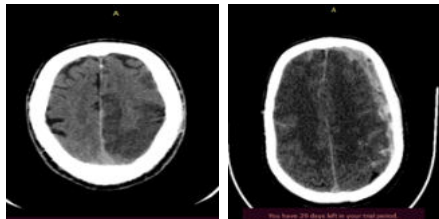
Figure 4: Axial CT images of brain showing Subacute subdural hematoma in the right fronto-parietal region.



**Figure 5: Axial CT images of brain showing Subdural hematoma along the left fronto-temporo-parietal convexities.**



**Figure 6: Axial and coronal CT images of brain showing left basal ganglia hemorrhage with intraventricular extension.**



**Figure 7: Axial CT images of brain showing diffuse effacement of cerebral sulci in parietal region.**

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## DISCUSSION

In neuroradiology, traumatic brain injury (TBI) is major and most common problem seen in all ages. There has been dramatic changes since the advent of CT scan helps in management of head trauma. In our results the peak incidence of road accident head trauma were in the age group of 20-40 yrs. Bharti et al reported that 64% patients sustain head injury in road traffic accidents(3) while Reverdin has reported that 60-70% of head injuries occur in young people(4).

This is a prospective & cross sectional hospital-based study. The study includes 60 patients, with GCS  $\leq$  12. The major CT imaging findings observed were (in order of frequency) subarachnoid hemorrhage (55/60), contusion (53/60), subdural hemorrhage (46/60) and midline shift (22/60). Intraventricular hemorrhage, effacement of basal cisterns, midline shift, diffuse axonal injury and herniation were significant predictors of unfavorable outcome.

CT scan has been very useful in evaluating the head trauma very rapidly and precisely with site and nature of injury with associated herniations, which helps in management effectively.

There has been various studies in which they were reported subarachnoid hemorrhage in TBI has poor outcome. [5,6] But however in our study we could not find an association between subarachnoid hemorrhage and unfavorable outcome.

## CONCLUSION

CT variables in addition with clinical condition of the patient based on Glasgow outcome score (GOS) observed at 6 months act as indicators of prognosis in patients with moderate to severe TBI. These are helpful in explaining the prognosis to the patient attenders and ensures utilization of limited resources.