Section: Neurosurgery

Original Research Article

PREDICTORS OF OUTCOME IN ACUTE SUBDURAL HEMATOMA IN A RESOURCE-LIMITED SETTING: A RETROSPECTIVE OBSERVATIONAL STUDY

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ABSTRACT

Background: Acute Subdural Hematoma is one of the critical brain inuries, which results in a very high mortality rate. Its outcome depends on variety of factors like age, comorbidities, medication patient is on, mechanism of injury, time of presentation, time of surgical evacuation or start of conservative measures. With Current timely interventions though the mortality has come down, its still a long way to go. The primary objective is to study factors responsible for possible neurological deterioration in a case of Acute Subdural Hematoma. Secondary objective is to Study the correctness of this prediction in the course of treatment in the hospital.

Materials and Methods: A prospective study conducted at a tertiary care hospital, enrolling all the patients with Acute Subdural Hematoma. Detailed evaluations, including history, clinical and radiological examinations, performed to determine a possible SDH Risk score, to categorize patients into Definitely requiring surgery, borderline and low risk. Borderline patients were divided into surgical and non-surgical group, Neurological deterioration in Non surgical group was looked for.

Results: 80 patients with Acute Subdural Hematoma meeting the inclusion and exclusion criteria were enrolled. Patients with high-risk score were surgically evacuated. Patients with Borderline score were given the options of continuing the conservative line of management or to go for surgical evacuation after fully explaining the risk of conservative management and the risks of surgery. Outcome in both Surgical and conservative group of Borderline cases was closely followed for a period of 14 days. 5 patients were falling onto borderline category. 38 patients underwent surgery, 42 patients treated conservatively. 5 patients who were in conservative management under borderline category showed neurological deterioration and eventually underwent surgery.

Conclusion: Acute subdural hematoma is leading cause of mortality among traumatic brain injury. SDH Risk score stands as a good tool in suggesting best line of management. With due timely intervention Borderline cases can also be saved with Surgical Evacuation. However, larger sample size is needed to expand the findings to all traumatic acute subdural hematoma patients.

Keywords: Brain injury, trauma, Acute subdural hematoma

INTRODUCTION

Acute subdural hematoma is a common neurosurgical emergency with mortality rates ranging from 55% to 80%. Current guidelines recommend surgical evacuation for hematoma thickness >10 mm or midline shift >5 mm, irrespective of GCS. However, these do not incorporate patient-specific clinical variables, making decision-making difficult—especially in resource-limited settings.[1-4]

This study aims to identify predictors of outcome and develop a bedside SDH score to guide surgical decisions more effectively.

MATERIALS AND METHODS

Study Design: Retrospective cohort study conducted at Government General Hospital, Kakinada.
Study Duration: January 2024 to July 2024, with follow-up up to 3 months.
Study Population: 80 patients diagnosed with acute subdural hematoma.
Variables Studied
Clinical Variables

- Age, gender
- Baseline mRS
- Comorbidities
- Antithrombotic usage
- Admission GCS
- Neuropsychiatric symptoms (delirium)
- Focal neurological deficits (anisocoria, aphasia, weakness)

Radiological Variables

- Hematoma thickness (>10 mm)
- Midline shift (>5 mm)
- Location and laterality

Outcomes

- Conservative vs surgical management
- Neurological deterioration
- Follow-up mRS score.

SDH Score Development.[2,3]
A scoring system was created based on statistically significant predictors:

Table 1: Components of SDH Score

Variable in SDH Score	Score Contribution
Age > 65	1
Female Sex	1
Pre Admission mRS 0 1 2 3	0 1 2 3
SDH Thickness (>10mm)	1
MLS (>5MM)	1
Focal Neurologic Symptoms	1
Neuropsychiatric Symptoms	1

Patients with SDH Score >7 were considered high-risk and likely to benefit from surgery.

RESULTS

Demographic Distribution

- Male: 83.75%
- Female: 16.25%

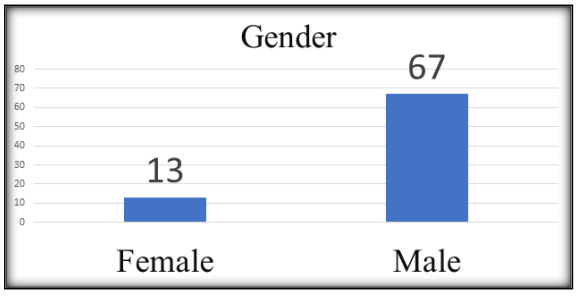

Figure 2: Gender Distribution

- Range: 3–15
- Higher GCS associated with conservative management
- Lower GCS associated with surgery and poorer outcomes

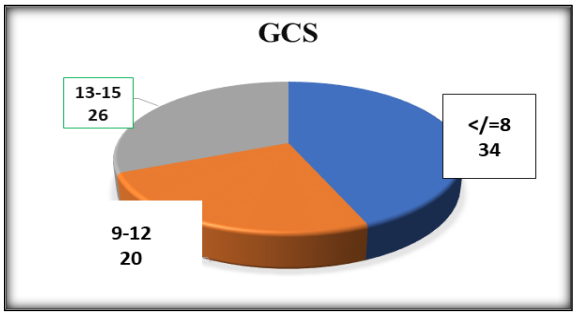

Figure 3: GCS Distribution

Age Distribution

- Mean age: 41.75 years
- Majority in middle-aged group

Radiological Findings

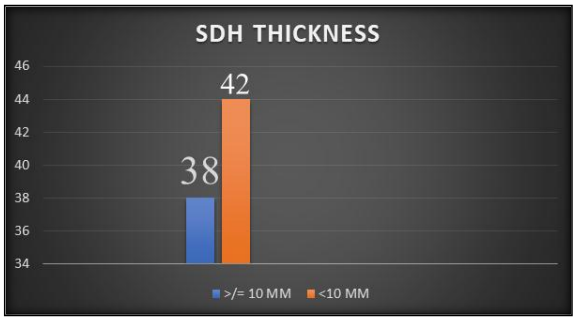

Figure 4: Hematoma Thickness Distribution

- 10 mm strongly associated with surgical intervention

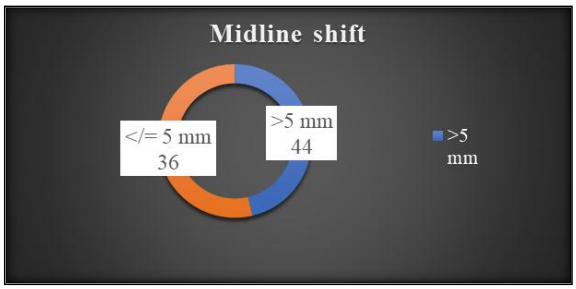

Figure 5: Midline Shift Distribution

- >5 mm correlated with poor prognosis

Treatment Modalities

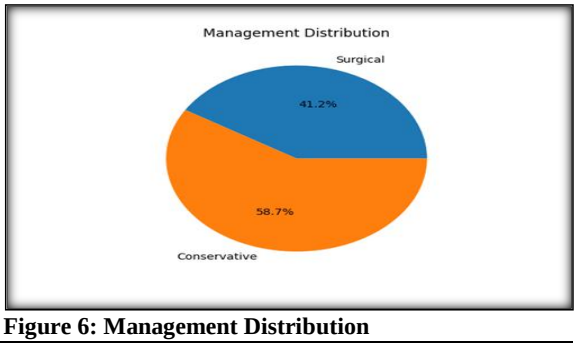

Figure 6: Management Distribution

- Conservative: 47 patients, 58.75%
- Surgical: 33 patients, 41.25%

Outcomes in Borderline Patients

- All 5 patients, whom we placed in borderline category according to our SDH Score of >7, but do not fall into surgical category under the conventional guidelines, deteriorated → required delayed surgery

SDH Score and Outcome

- Score ≤7 → similar outcomes in both groups
- Score >7 → significantly better outcomes with surgery

Comparison with Conventional Guidelines

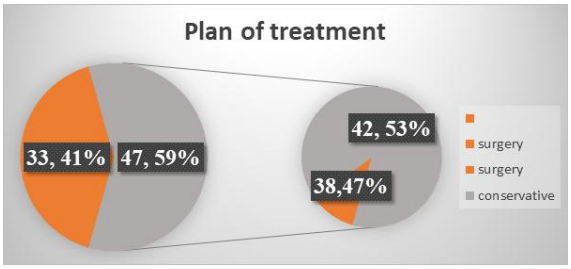

Figure 7: SDH Score vs Conventional Guidelines

- Conventional approach → delayed surgery in some patients
- SDH score → earlier identification of surgical candidates
- If SDH Score is applied, 5 patients who required delayed surgery with conventional guidelines and whose outcome became questionable because of the delayed surgery, would have been better if they underwent early surgery based on SDH score criteria.

DISCUSSION

This study demonstrates that reliance solely on radiological criteria may delay necessary surgical intervention in some patients. The SDH score incorporates both clinical and imaging variables, improving prediction accuracy.[5-7]

Patients with focal neurological deficits and neuropsychiatric symptoms were more likely to deteriorate, highlighting the importance of comprehensive clinical evaluation.

The SDH scoring system identified patients who would have otherwise been managed conservatively but later deteriorated. Early surgery in these patients improved outcomes.

Limitations

- Retrospective design
- Single-center study
- Limited sample size
- Requires external validation

CONCLUSION

Acute subdural hematoma remains a major cause of mortality in traumatic brain injury. The SDH score is a practical and effective tool for early decision-making in resource-limited settings. Patients with scores >7 benefit significantly from early surgical intervention, reducing complications associated with delayed treatment.

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