ORIGINAL RESEARCH PAPER

Neurosurgery

A RETROSPECTIVE ANALYSIS OF SURGICAL OUTCOMES FOR ACUTE SUBDURAL HEMATOMA IN A PERIPHERAL TERTIARY CARE CENTRE

KEY WORDS: Acute Subdural Hematoma, Neurotrauma.

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INTRODUCTION

Death in neurotrauma practice, though inevitable, is an undesirable outcome. Again, a death after a surgical intervention which is intended for the betterment of the patient is truly agonising for a neurosurgeon.

Acute subdural hematoma is the most common type of traumatic intra cranial hematoma accounting for 24% cases of severe head injuries and caries highest mortality. The mortality rates are seen to be ranging from 30% to 90%.

Incidence

Acute subdural hematomas accounts for 24% of severe head injury patients and the incidence of severe head injury is 21 per 100000 people.

Pathophysiology

Acute subdural hematoma occurs in of 3 mechanisms.

- Damage to surface cortical vessel.
- Bleeding from underlying parenchyma injury.
- Tearing of bridging veins from cortex to dural venous sinuses.

Arbitrarily divided into 3 stages. i.e. Acute SDH-1 to 3 days from injury; Sub acute SDH- 4 to 21 days of injury; Chronic SDH -after 3 weeks of injury.

Associated brain injury

The chief factor that makes an acute subdural hematoma a serious condition is the frequency with which associated brain damage occurs. Such brain damage varies from simple sub pial haemorrhage to extensive laceration of brain. Cerebral edema and brain stem distortion often complicates the picture.

Site of hematoma

The common sites for the acute subdural hematoma are the inferior frontal, the anterior temporal and the parietal regions. Fronto polar and sub frontal hematomas, hematomas in the middle cranial fossa, over the occipital pole and hematomas of posterior fossa and in the inter hemispheric regions have all been encountered.

Clinical picture

Alteration in conscious level, gradual worsening in the level of consciousness is the classical presentation. A fluctuation level of consciousness may also be seen. Increasing restlessness is an important sign. Some evidence of localization is present in about 70% of cases. In the rest the localizing signs do not occur either because of associated lesions or rapid development of brainstem signs. The onset of pupillary changes and hemiparesis points to the side of the lesion. With the introduction and wide availability of cranial CT, early diagnosis and timely surgical intervention for SDH is an attainable gold standard.

Aim and Objective

A retrospective analysis was carried out on the death of 38 patients with post traumatic acute subdural hematoma, who underwent decompressive craniotomy under a uniform protocol at our institution, between July 2017 and March 2018, in order to study the various parameters which led to the undesired outcome.

MATERIALS AND METHODS

This retrospective study is based on the collected experience of 38 patients who died after being managed for acute subdural hematoma with surgical decompression at Thanjavur Medical college Hospital, which caters neurotrauma care for nearly six districts in its vincity.

Data collected from our neurotrauma registry (july 2017-march 2018) has been used for the analysis. In this study period, 74 patients with post traumatic acute SDH underwent decompressive craniectomy. All the 38 patients who died in the post operative period has been taken into account without any exclusion criteria.

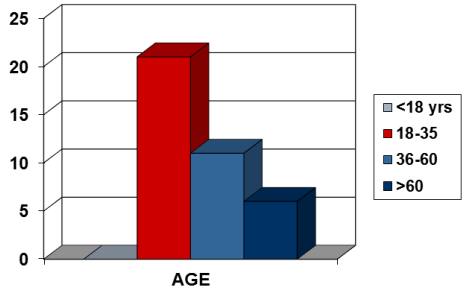
Once patients presenting to our emergency department have had their cardiopulmonary status stabilized, they have a rapid and directed neurologic examination and appropriate imaging. In our facility, patients with acute subdural hematoma with more than 5 mm of shift proceed to the operating room, irrespective of the GCS, unless brain-dead. Trauma registry data are prospectively recorded by the treating doctors during routine clinical care. Trained clinical data specialists abstract additional data from the medical record for review and reporting purposes. Data are composed of demographic information, medical history, and detailed information on presentation to the hospital and the course of treatment

- Data collected includes
- the age of the patient,
- nature of injury,
- interval between the time of trauma and time of admission to the hospital,
- neurological and hemodynamic status at the time of admission,
- necessity for pre operative blood transfusion
- other associated injuries,
- respiratory efforts,
- imaging results,
- intra operative findings, blood loss and the need for intra-op transfusion,
- Necessity for post-operative ventilator support and post-op care.

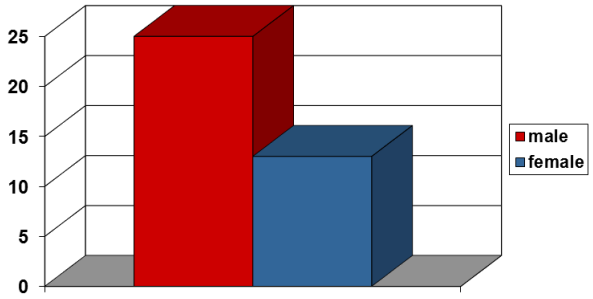
Observations

AGE:

Most patient who suffered acute sub dural hematoma were young<35yrs (n=21) and middle aged 36-59(n=11) rather than old >60yrs(n=6) .

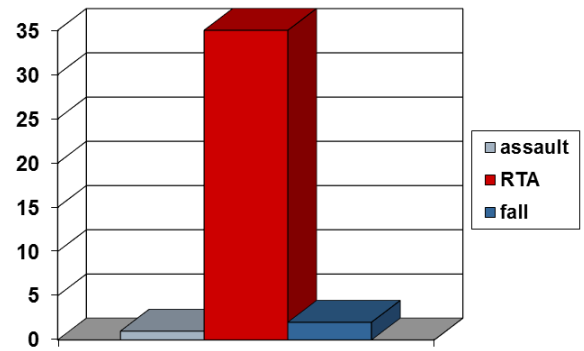


SEX:
Regarding the sex, men (n=25) are more in number compared to women.(n=13)

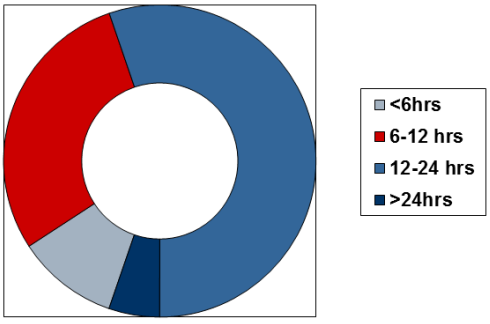


- 26 patients had been under the influence of alcohol at the time of trauma.

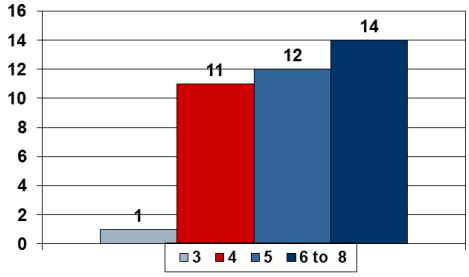
MODE OF INJURY:
Road traffic accidents were the most common mode of injury (n=35), of which motorcyclists-32, pedestrians- 3.



TIME OF PRESENTATION FROM TRAUMA:
Most patients (n=23) presented atleast 12 hours after the time of trauma, out of which 2 patients have presented after 24 hours.



GLASGOW COMA SCALE AT PRESENTATION:
All the patients on evaluation at our emergency department at the time of admission had gcs score</= 8 of which 24 patients had gcs score </=5. (overall mean= 5.13)



ASSOCIATED INJURIES:
Two patients had associated long bone injuries. Three patients had severe chest injury which mandated intercostal drainage
Three patients had been hemodynamically unstable at the time of admission, which resuscitation, pre op blood transfusion and inotropic support before surgical decompression

COMORBIDITIES:
Known Comorbid illness were present in 11 patients, 4 patients were diabetic and hypertensive,2 were diabetic, 2 were hypertensive and CAD patient, 2 were bronchial asthma patients, one patient a known case of CVA and type 2 DM

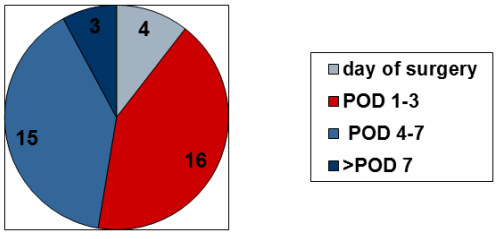
- All the patients had undergone emergency ET intubation at the time of admission (in view of poor GCS). 18 patients had poor spontaneous respiratory efforts
- 6 patients had primary brainstem contusion in the initial imaging, one patient had ipsilateral PCA territory ischemic changes, one patient had associated contralateral temporal ICH, 8 patients had ipsilateral FTP SAH.

INTRA OP FINDINGS
During surgery brain has been severely contused in 22 patients, of whom burst temporal lobe had been found in 13 patients. Brain had been tense and not pulsating in 6 patients. One patient had an intra-op hemodynamic instability and was on inotropic support in the post operative period

All the patients were given elective post op ventilator support

OUTCOME:

4 patients died on the day of surgery itself, 16 patients died between post op day 1 to 3, 15 died between post op day 3 to 7, and 3 patients after 7th POD



RESULTS AND INTERPRETATIONS
- This data cannot be extrapolated as that the survival is worse in young age. It is the reflection of increased incidence of trauma in the younger age group. And out of the 74 patients who had undergone in the study period, 66 belong to young and middle aged,i.e., 6 out of 8 elderly people died after surgery.
- 25 out of 52 men (48%), 13 out of 22 (59%) women had died after Decompression.
- 18 out of 23 patients who presented after 12 hrs of trauma died before POD 3
- All the four patients who died on the day of surgery had GCS 3 (n=1) or 4 (n=3),one among which had intra operative hemodynamic instability
- All those four patients had been found to severely contused, tense, non pulsating brain during surgery. Rest of the two patients with similar finding died on POD-1
- All the patients who died before POD 3 had GCS score 5 or less
- All patients with associated injuries (chest and long bone injuries) died before POD 3
- All patients with associated findings in brain imaging died before POD 3
- one patient of the study group developed DKA died between POD 4 and 7
- Two patients developed AKI, one needed RRT for the same, and both the patients died between POD 4-7
- Electrolyte imbalance noticed in most patients died between POD 4-7 (most patients had hypokalemia) despite the efforts to correct the same
- Out of the 18 patients who crossed POD 3, 15 patients could

not be weaned from ventillator at any point in the post op period
- One patient had severe UGI bleed on POD 5, blood transfusions, antisecretory drugs, fluid resuscitation could not help the patient and he died on that same night
- One patient had been successfully weaned from ventillator on 6th POD, and showed signs of neurological improvement. Tracheostomy closed. Patients had aspirated feeds on POD 11, Tracheostomy re established, but he failed to improve and died on 12th POD
- Another one had a tracheostomy tube block and got desaturated,after being shifted to general ward. patient shifted back to neuro-icu for ventillator support, but he could not be saved.
- All the 20 deaths on/before POD 3, are directly attributed to the impact of trauma (poor GCS, polytrauma, imaging results, intra op findings)
- Out of the 15 deaths b/w POD 4 and 7
- 9 patients had documented metabolic complications
- One with uncontrolled DKA
- Two had AKI
- 7 had electrolyte imbalance
- One patient had UGI bleed
- Five patients, gradually deteriorated since the day of surgery, became ventilator dependent, and died (no cause other than head injury is reported in autopsy)
- Deaths after 7th POD
- One due to aspiration of feeds
- One due tracheostomy obstruction
- One patient,had CSF otorrhea post operatively, had high temperature and died on 14th POD despite our attempts with higher antibitiotics

CONCLUSIONS

Pre operative GCS score and the time interval between the trauma and presentation at the trauma-care had the major impact on the outcome. Being the tertiary care centre covering six rural districts, the initial admission at district head quarters hospital and delayed referral have been the primary factors which need to be addressed. Patients who survive beyond POD 3, attention to the metabolic parameters would have a sound edge in decreasing the mortality.

In the hospital which serves the poor and illiterate people, more focus should be laid upon educating the relatives, in taking care of the patients recovering from coma, in terms of feeding and tracheostomy care. Pitfalls in rehabilitation and education result in avoidable undesired outcome.