**Scholars Journal of Applied Medical Sciences (SJAMS)** **ISSN 2320-6691 (Online)**
**Sch. J. App. Med. Sci., 2017; 5(6E):2478-2482** **ISSN 2347-954X (Print)**

(An International Publisher for Academic and Scientific Resources)
www.saspublishers.com DOI: 10.36347/sjams.2017.v05i06.077

Original Research Article

# A Study on various Clinical Presentations of Extradural Hemorrhage, Factors affecting Treatment and Early Outcome

**K. Jagadeesh Babu*[1], V. Bhaskar[2]**
[1]Associate Professor, Department of Neurosurgery, Mamata Medical College, Khammam, Telangana, India.
[2]Junior Resident, Department of Neurosurgery, Mamata Medical College, Khammam, Telangana, India.

***Corresponding author**
K. Jagadeesh Babu
Email: kjagadeesh.mmckmm@gmail.com

**Abstract:** This study of 100 cases of extradural hemorrhage was performed at Mamata general & superspeciality hospital, Khammam during the period of Oct-2014 to Sep-2015. Road traffic accident was the commonest mode of injury for EDH accounting for 58 %.Male gender was found predominant .Most vulnerable age group for traumatic EDH was between 21-30 years old (28%) . Alcohol influence had a significant correlation in the causation and proved a social evil. About 44% of patients seek and obtained medical attention within six hours of incident. Maximum number (95%) had history of loss of consciousness. The commonest site for EDH was found Frontal (36%) followed by Temporal (21%). Both conservative (47%) and surgical management (53%) are efficient, with a low incidence of complications. Surgical management recommended for patients in coma (GCS score <9) with anisocoria and for those with a hematoma larger than 30 $cm^3$ in size, regardless of the patient's GCS score. Recovery in 79% cases achieved good as per Glasgow outcome score.
**Keywords:** Traumatic brain injuries, Extradural haemorrhage, Factors, Treatment, Outcome.

## INTRODUCTION

Traumatic brain injuries (TBI) are a steadily increasing and major cause of morbidity, mortality, and loss of productivity in resource-limited settings, particularly among younger age groups in the second to fourth decades of life[1]. The rapid motorization of India, especially during the past two decades has resulted in increasing numbers of injuries and deaths due to road traffic crashes[2,3]. Although epidural hematomas are relatively uncommon, they should always be considered in evaluation of a serious head injury. Patients with epidural hematomas who meet surgical criteria and receive prompt surgical intervention can have an excellent prognosis, presumably owing to limited underlying primary brain damage from the traumatic event. The decision to perform a surgery in a patient with a traumatic extraaxial hematoma is dependent on several factors (neurological status, size of hematoma, age of patients, CT findings) but also may depend on the judgement of the treating neurosurgeon[4].

The aim of this study was to analyse various causes, clinical presentations, factors influencing presentations of traumatic extra dural hematoma andto evaluate the postoperative outcome in patients with head injury with an extradural hematoma before surgery.

## MATERIALS AND METHODS

This study included 100 patients admitted to Mamata General & Super speciality hospital over the past two years with head injury, diagnosed to have traumatic extradural hemorrhage.

**Inclusion Criteria:**

1. All patients between age groups of 5 to 70 years are included.
2. Study includes evaluation of Traumatic Extradural Hemorrhage.

**Exclusion Criteria**

1. All patients <5 yrs and > 70 yrs are excluded.
2. Non traumatic causes are excluded.

3. Head injury patients without Extradural Hemorrhage are excluded from the study.
4. Long term outcome excluded.
5. Patients bearing associated injury to chest, abdomen and extremities are excluded.

**Methods:**

1) A detailed history with regards to
   a) Time of incident
   b) Alcohol influence
   c) Mode of injury
   d) Time of arrival to Hospital.

2) All patients subjected to thorough initial clinical examinations and are noted.

3) All patients were subjected to emergency and follow up CTScan – Brain.

4) Patients were operated, operative findings noted, post- operative period recorded and analyzed.

5) The study evaluates initial outcome, excluding long term outcome.

## RESULTS AND DISCUSSION

A total of 100 cases of Extradural hemorrhage were admitted and operated at Mamata super speciality hospital, Khammam over the span of 1 year of study period and out of these 58% cases were of RTA, 27% cases were of fall from height, 12% cases were of assault and other trauma.

### a) Age distribution

This study revealed that maximum patients suffering from EDH are in the age group of 21-30 yrs(28%).The details of age incidences are given in table 1. Many other studies of traumatic EDH too report that the commonest age of presentation is early adulthood [1, 5-7].

**Table 1: Age distribution of patients**

| Age group | No/% of patients |
|---|---|
| 5-10 yrs | 6 |
| 11-20 yrs | 22 |
| 21-30yrs | 28 |
| 31-40yrs | 26 |
| 41-50yrs | 12 |
| 51-60yrs | 4 |
| 61-70yrs | 2 |

### b) Sex distribution

This study showed that males are predominant as compared to females. Out of 100 cases, 95 are Males (95%) whereas only five casesare Female (5%). A similar picture of male preponderance has been depicted by various studies.[1,5-8]

### c) Mode of injuries

This study revealed that most common mode of injury is Road traffic accidents (58%), In this 37% people were alcoholics. Accidental fall is seen in 27% in which 17% were alcoholic, 10% cases were assaults in which 9%alcoholics other cases are 5%. A total of 63% of cases occurred under the influence of alcohol. Most of studies shows that 50% of cases were due to road traffic accidents[6-8].

### d) Time of arrival

Majority of cases reached hospital in < 6hrs from time of injury (44%). About 37% of people reached in 6-12 hours and 19% reached after 12 hours. There is an established relationship between outcome of patients and the time lag between injury and surgical intervention. Guidance from the Royal College of Surgeons of England recommends that surgical decompression should be carried out within 240 min (4 h) of the onset of significant symptoms in order to ensure good result [5]. Majority of cases in our study reached hospital < 6hrs from the time of injury with promising immediate results and excellent prognosis, thus emphasising that rapid diagnosis and evacuation of traumatic EDH are critical factors for outcome.

### e)Symptomatology:

The different symptoms in this study were shown in table 2.The classic clinical course of a patient with EDH was first described by Jacobson in 1886: initial loss of consciousness after trauma, transient complete recovery (lucid interval), then rapid progression of neurological deterioration. This classic presentation occurs in only 14% to 21% of patients with EDH. Neurological deterioration from an expanding EDH typically results in obtundation, contralateral hemiparesis, ipsilateral oculomotor nerve paresis, decerebrate rigidity, arterial hypertension, cardiac arrhythmias, respiratory disturbances and finally apnoea and death. Development of these symptoms depends on hematoma size and the presence of associated intracranial lesions[10]. In our series, 95% cases presented with Symptom of loss of consciousness. The next prominent symptom being vomiting observed in 68% cases & head ache in 42% cases which are better indicators of raised intracranial pressure, ENT bleeding constitutes 42%. 11% had convulsions. Babu *et al*[6] and Huda *et al*[11] also

report LOC to be one of the commonest presenting symptom followed by headache and neurological deficits.

**Table 2: Symptoms in patients**

| | No/% of patients |
|---|---|
| With loss of consciousness | 95 |
| Without loss of consciousness | 5 |
| Headache | 42 |
| Vomiting | 68 |
| Ent bleeding | 42 |
| Convulsions | 11 |
| Facial weakness | 2 |
| Hemi paresis | 11 |

**f) Level of Glasgow Coma Scale (GCS):**

Survival of patients with EDH is limited by numerous factors; the age of the patient, the speed of haematoma formation, the size and location of the clot, the interval between onset of papillary changes and surgery, the presence of associated intracranial lesions and pre-operative GCS. The degree of primary brain injury, shown by a low GCS score on admission, seems to be one of the most important predictors of eventual patient prognosis, outcome being better when the initial GCS is high [5,9,12,].

**Table 3: Level of Glasgow Coma Scale (GCS)**

| LEVEL OF GCS | % |
|---|---|
| 15 | 40 |
| 13-14 | 25 |
| 9-12 | 21 |
| 8-5 | 8 |
| 3-4 | 6 |

**g) EDH with mass effect**:

Out of 100 cases, 53% of the cases analysed in the study presentedwith mass effect over brain parenchyma, Khan MB et al[13] also report a incidence of Seven patients (29.1%) with a midline shift in initial CT imaging in their series of paediatric patients.

**h)Presentation of EDH:**

Out of 100 cases, 85% of the cases presented as EDH with associated fracture. Remaining 15% of cases presented with associated brain parenchymal injury as contusion (coup and counter coup), acute SDH and intracranial hemorrhage.

**i)Pupil status**:

In the present study 76% patients had no papillary changes on presentation, while 13% had unequal non reacting pupils and 11% had bilateral dilated non reacting pupils. Huda *et al*[11] report unilateral pupillary dilatation in 2.6% and bilateral dilatation in 2.7% in their series of 1025 patients.

Focal neurological signs in patients with EDH depend upon the position of the haematoma. In general, a temporal haematoma will produce a progressive contralateral spastic hemiparesis and an ipsilateral dilated pupil. Further progression will result in bilateral spastic limbs, a decerebrate posture and bilaterally dilated pupils. Occasionally the hemiparesis may initially be ipsilateral, due to compression of the contralateral crus cerebri of the tentorial edge, but it is rare for the opposite pupil to be involved first. The change in vital signs shows the classic Cushing response to a rise in intracranial pressure —bradycardia accompanied by an increase in blood pressure. Disturbances in respiration will develop into a Cheyne–Stokes pattern of breathing. Extradural haematomas occurring at other than the temporal position show modifications of this clinical presentation. Frontal haematomas show evidence of lateralizing signs late in their evolution, the predominant features being a deterioration of consciousness and pupil abnormalities. In the posterior fossa the vital signs tend to be affected early, followed by a change in conscious state. The pupils and limbs may not be affected until the patient becomes deeply unconscious. Haematomas in the posterior fossa may cause sudden respiratory failure[14].

**j) EDH location:**

The dominant type of EDH observed in the study was Frontal presenting in 36% cases followed by Temporal in 21% cases next only is Temporal parietal in 10% cases. Posterior fossa EDH presentation was relatively less found in 5% as occipital.

**Table 4: Location of EDH**

| location of EDH | % |
|---|---|
| Frontal | 36 |
| Temporal | 21 |
| Occipital | 5 |
| Parietal | 7 |
| Fronto-temporal | 4 |
| Fronto-temporo-parietal | 2 |
| Tempero-parietal | 10 |
| Parieto-occipital | 5 |
| Fronto-parietal | 8 |

The dominant type of EDH observed in the present study was Frontal presenting in 36% cases followed by Temporal in 21% cases next only is Temporal parietal in 10% cases. Posterior fossa EDH presentation was relatively less found in 5% as occipital. The most common sites for extradural haematoma are the temporal region followed by the frontal area. Posterior fossa and parasagittal extradural haematomas are relatively uncommon. In most cases the haemorrhage is from a torn middle meningeal artery or its branches but haematomas may also develop from haemorrhage from extradural veins, the superior sagittal sinus, transverse sinus or posterior meningeal artery, the last two being responsible for the posterior fossa extradural haematomas[14].

**k) Treatment**

Out of 100 cases, surgical approach was considered in 57 patients with emergency decompressive craniotomy & evacuation of blood clot. while remaining 47 patients were managed conservatively. Bullock et al [4,15,16] suggested criteria for the management of EDH in 2006. They strongly recommended urgent surgical management for patients in coma (GCS score <9) with anisocoria and for those with a hematoma larger than 30 $cm^3$ in size, regardless of the patient's Glasgow Coma Scale (GCS) score. Patients with an EDH less than 30 $cm^3$, less than 15-mm in thickness, with less than 5-mm of midline shift, and a GCS score greater than 8 without focal deficits were felt to be candidates for nonsurgical management with close observation and serial CT scans. Babu*et al*[6] in their series of 300 cases, 245 cases were operated on emergency basis while rest were treated conservatively.

**l)Outcome**:

Patients with extradural hematoma (EDH) are generally treatable and often have a favorable clinical outcome when free of other injuries.Outcome of patients during the period of study was assessed with Glasgow Outcome Scale(GOS). Good recovery was seen in 79% ofpatients. Moderate disability is seen in 11% of patients. Severe Disability, vegetative state and death accounted only 10% of the cases. Overall mortality of 8% occurred in 6 patients with GCS 3-4 and 2 patients with GCS 5-8. None of the patients in the conservative management group of 43 patients were lost and 93% of them had a GOS of 5-6(good recovery) and 7% had a GOS of 3-4(moderate recovery). In the surgical management group of 57 cases, 66.6% had a GOS of 5-6 and 19.2% had a GOS of 3-4 and there were 8 mortalities.

**Table 5: Glasgow outcome scores**

| Glasgow outcome scale | No/% of patients . |
|---|---|
| Good Recovery | 79 |
| Moderate Disability | 11 |
| Severe Disability | 2 |
| Vegetative State | 0 |
| Death | 8 |

Agrawal *et al*[1] in their study of traumatic brain injuries in Maharashtra, a total 1056 patients with 45 cases of EDH reported a GOS good recovery in 4.9% for patients with a GCS of 3-8 at presentation and 68.6% for patients with GCS 13-15.Khan *et al*[14] in their study of 24 paediatric EDH patients all of whom were surgically managed, report overall mortality in three (12.5%) patients and postoperatively two (8.3%) patients had seizures while infections occurred in five patients (20.8%). Four (16.7%) patients had residual hematoma on post operative CT scans. On one month follow up, 15 (62.5%) patients had a GOS score of 5, 4 (16.7%) patients had a GOS score of 4, 2 (8.3%) patients had a GOS score of 3, while 3 (12.5%) patients had died (GOS = 1).

## CONCLUSION

Traumatic brain injuries are a steadily increasing due to road traffic accidents, in which patients with extradural hematoma have a significance importance. Surgical management recommended for patients in coma (GCS score <9) with anisocoria and for those with a hematoma larger than 30 $cm^3$ in size, regardless of the patient's GCS score. Patients with an EDH less than 30 $cm^3$, less than 15-mm in thickness, with less than 5-mm of midline shift, and a GCS score greater than 8 without focal deficits were felt to be candidates for nonsurgical management with close observation and serial CT scans. Prognosis and recovery are good in both conditions.

## REFERENCES

1. Agrawal A, Galwankar S, Kapil V et al. Epidemiology and clinical characteristics of traumatic brain injuries in a rural setting in Maharashtra, India. 2007-2009.International Journal of Critical Illness and Injury Science. Sep-Dec 2012;2(3):167-171.

2. Gururaj G. Epidemiology of traumatic brain injuries: Indian scenario. Neurol Res 2002;24:24-8.
3. Oertel M, Kelly DF, McArthur D, Boscardin WJ, Glenn TC, Lee JH, *et al*. Progressive hemorrhage after head trauma: Predictors and consequences of the evolving injury. J Neurosurg 2002;96:109-16.
4. Maugeri R et al. Conservative Vs surgical management of post traumatic epidural haematoma. Am J Case Rep 2015;16:811-817.
5. Islam MJ, Saha SK, Elahy MF, Islam KMT, Ahamed SU. Factors influencing the outcome of patients with acute extradural haematomas undergoing surgery. Bangladesh J Of Med Science Apr 2011;10(2)
6. Babu ML, Bhasin SK, Kumar A. Extradural haematoma- an experience of 300 cases. JK Science 2005, Oct-Dec; 7(4):205-207.
7. Chen Hao, Guo Yan et al. Progressive epidural haematoma in patients with head trauma: incidence, outcome and risk factors. Emergency medicine Int. Vol 2012, article ID 134905:1-8.
8. Raja IA, Vohra AH, Ahmed M. Neurotauma in Pakistan. World J Surg 2001; 25(9):1230-7.
9. Mezue WC, Ndubuisi CA et al. Traumatic extradural haematoma in Enugu, Nigeria. Niger J Surg 2012, Jul-Dec; 18(2):80-84.
10. Shahlaie K, Zwienberg-Lee M, Muizelaar JP. Clinical pathophysiology of TBI. Youman's neurological surgery, 6$^{th}$Edn, chap 331, 2011(4):3366-67
11. Huda MF, Mohanty S, Sharma V et al. Double extradural haematoma: An analysis of 46 cases. Neurology India. Dec 2004; 52(4):450-452.
12. Cheung PS, lam JM, Yeung JH et al. Outcome of traumatic extradural haematoma in Hongkong. Injury 2007; 38:76-80.
13. Khan MB, Riaz M et al. Surgical management of traumatic extra dural haematoma in children: experiences and analysis from 24 consecutively treated patients in a developing country. Surgical neurology International, Aug 2013; 4:103.
14. Kaye AH. Traumatic intracranial haematomas. Essential neurosurgery, 3$^{rd}$ Edn, chap 5, 2005:56.
15. Bullock MR, Chesnut R, Ghajar J, Gordon D, Hartl R, Newell DW, Servadei F, Walters BC, Wilberger J, Surgical Management of Traumatic Brain Injury Author G (2006a) Surgical management of traumatic parenchymal lesions. Neurosurgery 58:S25-46; discussion Si-iv.
16. Bullock MR, Chesnut R, Ghajar J, Gordon D, Hartl R, Newell DW et al. Surgical management of acute epidural haematomas. Neurosurgery 2006;58(Suppl): 52-7.