

CLINICAL EPIDEMIOLOGY AND MANAGEMENT OF EXTRADURAL HAEMORRHAGE IN RURAL INDIANeha S. Jadhav¹, Avinash S. K², Amol B. Kamble³¹MCh Resident, Department of Neurosurgery, KEM, Mumbai, Maharashtra, India.²Senior Resident, Department of General Surgery, GMCH, Miraj, Maharashtra, India.³Assistant Professor, Department of General Surgery, GMCH, Miraj, Maharashtra, India.**ABSTRACT****BACKGROUND**

Among the top ten causes of mortality in India, head injury was the tenth cause two decades back. But with increasing urban expansion and lifestyle changes, trauma will occupy the fifth position in the list of major killers and third position among causes of disease burden in 2020.

The aim of this study was to analyse the clinical spectrum and to evaluate the postoperative outcome in patients with head injury with an extradural haematoma (EDH).

MATERIALS AND METHODS

This was a retrospective observational study which included 100 patients admitted in our Government Medical College, Miraj, Maharashtra, India over the past two years (01/06/2016 to 30/05/2018) with head injury, diagnosed to have traumatic Extradural Haemorrhage (EDH). A detailed clinical history was taken, physical examination done and CT scan performed in all patients. For patients who were subjected to surgery, operative and post-operative findings were noted.

RESULTS

Maximum patients suffering from EDH are in the age group of 21 - 40 years (56%) with male predominance (82%). Most common mode of injury is RTA (60%) under the influence of alcohol. Majority of cases reached hospital within 12 hours from time of injury (75%). 60% of patients with EDH presented with Loss of Consciousness (LOC) followed by vomiting in 70% of cases followed by Headache in 45% of cases. 58% of the cases presented with mass effect over brain parenchyma with frontotemporoparietal EDH as the most common location. Out of 100 cases, surgical approach was considered in 52 patients, while remaining 48 patients were managed conservatively.

CONCLUSION

Early presentation, with GCS in between 9 - 15, has good clinical outcome.

KEY WORDS

Epidural Haematoma (EDH), Loss of Consciousness (LOC), Rural India.

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BACKGROUND

India is undergoing major economic and demographic transition coupled with increasing urbanisation and motorisation. Among the top ten causes of mortality in the country, head injury was the tenth cause two decades back. But with the increasing urban expansion and lifestyle changes, trauma will occupy the fifth position in the list of major killers and third position among causes of disease burden in 2020.^{1,2,3,4}

Epidural haematomas occur most commonly after a head trauma, which may cause a temporary loss of consciousness or a coma. The trauma often involves the temporal lobe and leads to tearing of the middle meningeal artery. It can also occur from rupture of the anterior meningeal artery or the dural venous sinuses.^{5,6,7}

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The majority of cases are accompanied by skull fracture. EDH may be associated with a transient period of consciousness, also known as a "lucid interval," after the initial loss of consciousness due to the primary brain injury. Following this "lucid interval," rapid deterioration due to blood accumulation may cause headache, vomiting, drowsiness, confusion, aphasia, seizures and hemiparesis.^{8,9,10} If the haematoma remains unresolved, potential complications include Increased Intracranial Pressure (ICP), ipsilateral dilated pupil due to compression of the oculomotor nerve.

Currently, EDH represents about 1% to 5.5% of intracranial lesions in patients with traumatic brain injury, its mortality reaching 20%. Despite the small percentage of patients with head trauma developing EDH, the rapid neurological deterioration observed is often dramatic.^{11,12} Early diagnosis and neurosurgical intervention in a timely manner promote the reduction of morbidity and mortality, so it is vital that people who deal with trauma patients are familiar with and trained to manage this type of injury.^{13,14,15}

Aim of the Study

The aim of this study was to analyse various causes, clinical presentations, factors influencing presentations and to evaluate the postoperative outcome in patients with head injury with an extradural haematoma before surgery and to formulate recommendations for improvement of therapy and

suggestions for the future.

MATERIALS AND METHODS

This is a prospective observational study, which included 100 patients admitted in Government Medical College over the past two years (01/06/2016 to 30/06/2018) with head injury, diagnosed to have traumatic extradural haemorrhage.

Inclusion Criteria

- All patients between age groups of 5 to 70 years were included.
- Study included evaluation of traumatic extradural haemorrhage.

Exclusion Criteria

- Long-term outcome excluded.
- Patients bearing associated injury to chest, abdomen and extremities were excluded.

Methods

- A detailed history with regards to-
 - a. Time of incident.
 - b. Alcohol influence.
 - c. Mode of injury.
 - d. Time of arrival to hospital.
- All patients subjected to thorough initial clinical examination.
- All patients were subjected to emergency and follow-up CT scan plain- Brain.
- Patients were operated, operative finding noted, postoperatively records were analysed.
- The study evaluated initial outcome, excluding long-term outcome.

RESULTS

Total 100 cases were included in the study.

Age Distribution

This study revealed that maximum patients suffering from EDH were in the age group of 21 - 40 years (56%). The details of age incidences are given in Table 1.

Age in Years	Number
5-20	26
21-40	56
41-60	14
61-80	4

Table 1. Age Distribution

Sex Distribution

This study showed that males were predominant as compared to females. Out of 100 cases 82 were males (82%), whereas 18 cases were females (18%) (Table 2).

Sex	Number (N= 100)
Male	82
Female	18

Table 2. Sex Distribution

Mode of Injuries

This study revealed that most common mode of injury was RTA (60%) and 66.67% of cases occurred under the influence

of alcohol. The details of mode of injuries is shown in Table 3.

Mode of Injury	Number (N= 100)
RTA	60
RTA with Alcohol	40
RTA without Alcohol	20
Accidental Fall	25
Assaults	15

Table 3. Mode of Injuries

Time of Arrival

Majority of cases reached hospital within 12 hours from the time of injury as shown in Table No. 4.

Time of Arrival	Number (N= 100)
< 12 hours	75
>12 hours	25

Table 4. Time of Arrival

Clinical Presentations

Majority of patients with EDH presented with vomiting in 70% cases followed by LOC in 60% of cases followed by headache in 45% of cases as shown in Table 5.

Symptom	Number (N= 100)
With LOC	60
Without LOC	40
Headache	45
Vomiting	70
ENT Bleeding	38
Convulsion	8
Hemiparesis	13

Table 5. Clinical Presentations

Glasgow Coma Score

Majority of cases were presented with GCS 15, i.e. 42% shown in Table 6.

GCS	Number (N= 100)
15	42
13-14	24
9-12	20
5-8	8
3-4	6

Table 6. Glasgow Coma Score

Patients with GCS, 15 accounts for 42% followed by GCS in between 9 - 13 which is 44%.

EDH with or without Mass Effect

Out of 100 cases, 58 cases presented with mass effect over brain parenchyma and 42 cases presented without mass effect.

Presentation of EDH

Out of 100 cases, 40% of the cases presented as pure isolated EDH. 40% of cases presented with associated fracture. Remaining 15% of cases presented with associated brain parenchymal injury shown in Table 7.

Presentation	Number (N= 100)
Pure Isolated EDH	40
Associated Fracture	45
Associated Brain Injury	15

Table 7. Presentation of EDH

Pupil Status

Majority of cases presented with equally reacting pupils at time of presentation to hospital, i.e. 70%. Details are shown in Table 8.

Pupil Status	Number N= 100
Equal/reactive	70
Unequal/non-reactive	20
Bil. dilated/non-reactive	10

Table 8. Pupil Status

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 shown in Table 9.

Location of EDH	Number (N= 100)
Frontal	10
Temporal	10
Occipital	4
Parietal	10
Fronto-temporal	8
Fronto-temporoparietal	25
Temporoparietal	20
Parieto-occipital	5
Fronto-parietal	8

Table 9. Location of EDH

Fronto-temporoparietal EDH is the most common, i.e. 25%. The dominant type of EDH observed in the study was fronto-temporoparietal presenting in 25% cases followed by temporoparietal in 20% cases.

Treatment

Out of 100 cases surgical approach was considered in 52 patients, while remaining 48 patients were managed conservatively.

Outcome

88 patients were recovered, whereas 12 patients died.

DISCUSSION

A total of 100 cases of extradural haemorrhage were registered during the period of study and out of these 60% cases were of RTA, 25% cases were of accidental fall and 15% cases were of assault. In this study, the most common age group was 21 - 40 years (56%). Incidence of head injury was more in age range of 21 to 40 years with 56% cases as compared to both extremes of life. The study was compared with various other studies conducted across India, as described in Table 10.^{17,18}

Study	Male	Female	Age Group
Saxena et al ¹⁶	86%	14%	20-40 years
Iqbal et al ¹⁷	81%	19%	21-30 years
Present Study	82%	18%	21-40 years

Table 10. Various Studies showing Age and Sex Determinants

In our study, EDH was more commonly found in Males (82%).

Mode of Injury as Determinant

The present study results are in concordance with other studies in reference to mode of injury, i.e. RTA followed by fall followed by assaults, which are compared and are shown in Table 11.

Study	RTA	Fall	Assaults
Saxena et al ¹⁶	72%	17%	5%
Iqbal et al ¹⁷	40%	44%	14%
Present Study	60%	25%	15%

Table 11. Mode of Injury as Determinant

66.67% of RTA occurred under influence of alcohol.

The dominant type of EDH observed in the study was fronto-temporoparietal with incidence of 25% cases followed by temporoparietal in 20% cases.

Pathak A et al reported from their study that the dominant type of EDH observed was temporoparietal in 43% cases followed by temporal in 21% of cases followed by frontal in 17% of cases. 40% cases presented with associated skull bone (64%, Pathak A et al) fracture, both linear and comminuted. 15% cases of brain parenchyma injury in the form of (10% Saxena et al) contusion, IVH (intraventricular haemorrhage) subdural haemorrhage and brainstem contusion excluding bony fracture together constituting 55% (75% Pathak A et al).

In the present study among 100 cases, 75% of cases could reach the treating hospital within 12 hours and remaining 25% cases after 12 hours. The study throws light in the significance of golden period in the management of extradural haemorrhage.¹⁸⁻²³

70% of cases presented with symptom of vomiting. The next prominent symptom being loss of consciousness observed in 60% cases and headache in 45% cases, which are the indicators of raised intracranial pressure, ENT bleeding constitutes 38%; 8% had convulsion and 13% had hemiparesis symptoms.

On initial clinical examination 42% cases had Glasgow coma scale score of 15/15, 24% with range of 13-14, 20% with range of 9-12, 8% with range of 8-5, 6% in range of 3-4.

70% had normal equally reacting pupils, 20% unequal and non-reacting, 10% bilateral dilated and fixed status as shown in Table 12.

Study		GCS Score		Pupil Status	
	9-15	5-8	3-4	E/R	Dil/NR
Saxena study ¹⁶	54%	35%	12%	73%	27%
Present study	86%	8%	6%	70%	10%

Table 12. Comparison of Clinical Determinant with other Studies

After initial resuscitation in appropriate cases, an emergency CT scan was obtained in all cases and found to have positive finding which was added by follow-up CT scan. 58% cases presented with mass effect. 52% of cases underwent emergency decompressive procedure and evacuation of blood clot. Remaining 40% were managed conservatively as per medical line of management.

88 patients were recovered, whereas 12 patients were succumbed to death.

In 8 cases (13% Gurupreeth et al), the head injury presenting as EDH was so severe that the victim could not survive even after emergency surgical intervention. They all presented to emergency ward > 12 hours of trauma with associated brain parenchyma injury and poor GCS score.

CONCLUSION

Road traffic accident is the most common causative agent for EDH accounting for 60%. Alcohol influence is a significant correlation to the causation. 60% cases had history of loss of consciousness, "the hallmark symptom of extradural haemorrhage" which should be seriously considered while taking history. Majority of patients obtained medical attention within 12 hours of head injury; so the onset of trauma and delay in the treatment had greatly influenced the patient outcome. Golden hour concept should be made aware among all healthcare providers. The degree of brain injury and the GCS difference were notable factors that were significant in determining the functional outcome of EDH. Early presentation to hospital with better GCS has good clinical outcome with minimal disability.

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