International Journal of Medical Research Professionals
P-ISSN: 2454-6356; E-ISSN: 2454-6364
DOI: 10.21276/ijmrp

IJMRP

Original Research Article.

Surgical Outcome of Extradural Haematoma Done Under Regional Scalp Block

Md. Jahangir Alam[1], Md. Tofael Hossain Bhuiyan[2*], Md. Shafiul Alam[3], Md. Moajjam Hossain Talukder[4], Md. Shafiqul Islam[5], Sukriti Das[6], Raziul Haque[7]

[1]MS (Neurosurgery), Dhaka Medical College Hospital, Dhaka, Bangladesh.
[2*]M.B.B.S., M.S. (Neurosurgery), Associate Professor,
Department of Neurosurgery, Rangpur Medical College, Rangpur, Bangladesh.
[3]Assistant Professor, Department of Gammaknife,
National Institute of Neurosciences & Hospital, Dhaka, Bangladesh.
[4]Assistant Professor, Department of Neurosurgery,
National Institute of Neurosciences & Hospital, Dhaka, Bangladesh.
[5]MBBS, MS, PHD, Associate Professor, Dhaka Medical College Hospital, Dhaka, Bangladesh.
[6]MBBS, FCPS (Surgery), FRCSEd, MS (Neurosurgery), Associate Professor,
Department of Neurosurgery, Dhaka Medical College Hospital (DMCH), Dhaka, Bangladesh.
[7]Associate Professor, Dhaka Medical College Hospital, Dhaka, Bangladesh.

ABSTRACT

Introduction: Epidural or extradural hematoma (haematoma) is a type of traumatic brain injury (TBI) which is a major cause of death and disability worldwide, especially in children and young adults. Causes include fall from height, vehicle accidents, and violence. TBI can cause a host of physical, cognitive, emotional, and behavioral effects, and outcome can range from complete recovery to permanent disability or death.

Materials and Methods: Data were collected by a pre-designed proforma. Patient's information was obtained through using patient's information sheet which involved questionnaire, clinical findings, CT scan findings. Purposive sampling method was followed for the study. It was a prospective observational study. Head injury patients diagnosed clinically and radiologically as EDH, 60 were included in the study. Group A: (Regional Scalp Block): Thirty and Group B (General Anaesthesia): Thirty. History was taken from the relatives or attendants of the patients. Surgery was conducted and complication and outcome were recorded and compared between the two groups.

Results: At discharge, among regional scalp block cases 16.7% had a good recovery, 83.3% had a moderate disability and among cases under GA 10.0% had a good recovery and 90.0% had a moderate disability. Two groups had no significant difference considering outcome at discharge. After one month, among regional scalp block cases 3.3 % had a good recovery, 96.7% had a moderate disability and among the cases under GA the outcome was same as scalp block. The surgical out come under regional scalp block was comparable with that of under GA.

Key words: Extradural Haematoma, TBI, Regional Scalp Block, Surgical, Disability.

***Correspondence to:**

Dr. Md. Tofael Hossain Bhuiyan,
M.B.B.S., M.S. (Neurosurgery),
Associate Professor,
Department of Neurosurgery,
Rangpur Medical College, Rangpur, Bangladesh.

Article History:

Received: 14-09-2017, **Revised:** 10-10-2017, **Accepted:** 16-11-2017

Access this article online	
Website: www.ijmrp.com	Quick Response code
DOI: 10.21276/ijmrp.2017.3.6.038	

INTRODUCTION

Expanding high-volume EDH can produce compression of cerebral tissue which in turn can impinge on the third cranial nerve, resulting in ipsilateral pupillary dilatation, compress the ipsilateral cerebral peduncles resulting in contra lateral hemi paresis, extensor motor response and deteriorating level of consciousness. Reported mortality rate ranges from 5-43%. Risk factors are advanced age, intradural lesions, temporal location, increased hematoma volume, rapid clinical progression, pupillary abnormalities, increased intracranial pressure (ICP) and low Glasgow coma scale (GCS).[1]

Epidural or extradural hematoma (haematoma) is a type of traumatic brain injury (TBI) in which a buildup of blood occurs between the dura mater (the tough outer membrane of the central nervous system) and the skull.[2] As many as 10-20% of all patients

with head injury are estimated to have extradural haematoma (EDH). Ratio of male female = 4: 1%. It usually occurs in young adults and is rare before age 2 years or after age 60 years. Perhaps the dura is more adherent to the inner table in these groups.[3]

Approximately 70-80% of the EDH is located in the temporo-parietal region, although extension to adjacent frontal and occipital areas is common. EDH is usually arterial in origin but may result from venous bleeding or as a result of oozing from the fractured skull bones in one third of patients.[4]

Table I: Study Design

Study Type	Study Population	Place and Duration of Study	Sampling Method and Sample Size
It was a prospective observational study	Head injury patients diagnosed clinically and radiologically as EDH, 60 were included in the study.	Department of Neurosurgery, Dhaka Medical College Hospital (DMCH). Jan 2008 to Oct 2009.	Purposive sampling Group A: (Regional Scalp Block): Thirty. Group B (General Anaesthesia): Thirty.

Table II: Types of study variables

Demographic Variables	Clinical Variables	Imaging Variables	Outcome Variables (GOS)
Age, Sex, Occupation	Mode Of Injury Unconsciousness Vomiting Convulsion GCS	CT Scan Of Brain Findings Site Of The Lesion: Associated Injuries (Contusion, Brain Oedema, Multiple Aerocele, Linear Fracture, Depressed Fracture).	Good Recovery (5) Moderate Disability (4) Severe Disability (3) Persistent Vegetative State (2) Death (1)

SUBJECTS AND METHODS

Inclusion Criteria: Patients presenting with EDH with the following criteria

- Traumatic acute EDH diagnosed clinically and radiologically, who underwent surgery either under RSB and GA.
- In all cases, the EDH was supratentorial
- Age of the study population was 16 years or more.

Exclusion Criteria: Patient with EDH having the following criteria was excluded from the study

- Complex craniofacial injury.
- Posterior fossa haemorrhage
- Associated parenchymal injury and IC clot.
- Patient not willing to be included in the study.
- Patient not attending the follow-up.

Data Collection: Data were collected by a pre-designed proforma. Patient's information was obtained through using patient's information sheet which involved questionnaire, clinical findings, CT scan findings.

Study Procedure: All clinically diagnosed cases of head injury after detail history and examination, further confirmation and classification was done with CT scan. Cases of EDH diagnosed on the basis of CT scan of brain were planned for surgery. History was taken from the relatives or attendants of the patients. They could not give the correct history about lucid interval. So, lucid interval was not possible to include in clinical presentation of this study. Patients selected for surgery were randomized into two anaesthetic procedures- RSB and GA. Each group consists of thirty patients. Surgery was conducted and complication and outcome were recorded and compared between the two groups.

RESULTS

Demographic characteristics of the study population: In group A, 40% of the patients belong to age 26-35 years and 35.33% of the patients belongs to age 16-25 years. In group B, 36.67% of the patients belong to age 16-25 years and 33.33% of the patients belongs to age 26-35 years. Statistically no significant difference was observed between two groups (p=0.946). About 63.3% of group A and 76.7% of group B was male, 36.7% of group and 23.3% of group B was female with no significant difference (p-0.260) Male-Female ratio in group-A was 1.7:1 and group-B was 3.2:1 In group A, 6.7% was Service holder, 36.7% Student, 23.3% was House wife, 16.7% Businessman, 16.7% Day laborer. In group B, 23.3% was Service holder, 40.0% Student, 13.3% was House wife, 10.0% Businessmen, 13.3% Day laborer.

Distribution of mode of injury by group: Table III shows that in group A, mode of injury was RTA (56.7%), Fall from height (13.3%) and Assault (30.0%). In group B, mode of injury was RTA (56.7%), Fall from height (20.0%) and Assault (23.3%). Figure I shows that in group A, 86.7% were unconscious, 96.7% had vomiting, 16.7% had convulsion and 10% had headache. In group B, 83.3% were unconscious, 100% had vomiting, 10% had convulsion and 20% had headache. As history was taken from the relatives or attendants of the patients, they could not give the correct history about lucid interval. So, lucid interval was not possible to include in clinical presentation.

Table IV shows that in group A 6.7% of EDH was located in Temporal region, 13.3% in Frontal region, 43.3% in Parietal region, 13.3% in Frontoparietal, 23.3% in Temporoparietal region and none in Occipital or Posterior fossa. In group B, 6.7% of EDH was located in temporal region, 16.7% in Frontal region, 10.0% in Parietal region, 20.0% in Frontoparietal, 40% in Temporoparietal region, 6.7% in Occipital area. Figure II shows that among the GCS group, GCS 9-13 was maximum in both group A and group B (80% and 63.33% each). Patients in GCS group 3-8 and GCS group 14-15 were almost same.

Table V shows that in group A out of all patients with moderate disability 60% had GCS 3-8, 40% had GCS 9-13 and in patients with good recovery 88% had GCS 9-13 and 12% had GCS 14-15.

Table III: Distribution of mode of injury by group

Mode of injury	Group		p value*
	Group A	Group B	
RTA	17 (56.7%)	17 (56.7%)	0.723
Fall from height	4(13.3%)	6 (20%)	
Assault	9 (30%)	7 (23.3%)	
Total	30 (100%)	30 (100%)	

*Chi-square test was done to measure the level of significance.

Figure I: Distribution of clinical presentation by group

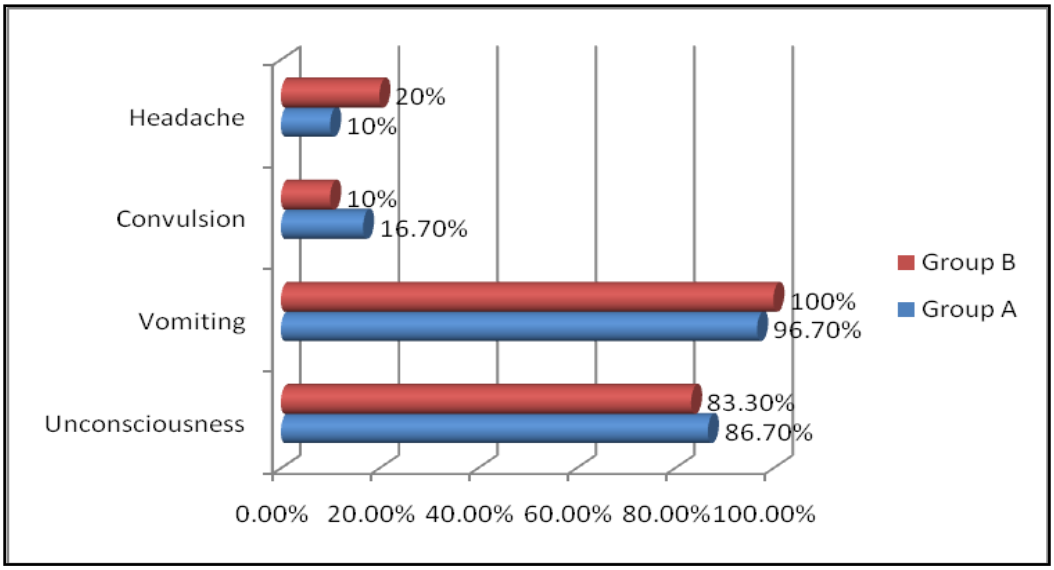

Table IV: Distribution of location of EDH by group

Location of EDH	Group		p value
	Group A	Group B	
Temporal	2 (6.7%)	2 (6.7%)	0.999**
Frontal	4 (13.3%)	5 (16.7%)	0.999**
Parietal	13 (43.3%)	3 (10%)	0.004*
Frontoparietal	4 (13.3%)	6 (20%)	0.488*
Temporoparietal	7 (23.3%)	12 (40%)	0.260**
Occipital	0 (0%)	2 (6.7%)	0.492**

*t test was done to measure the level of significance.

Figure II: Distribution of patients according to GCS category

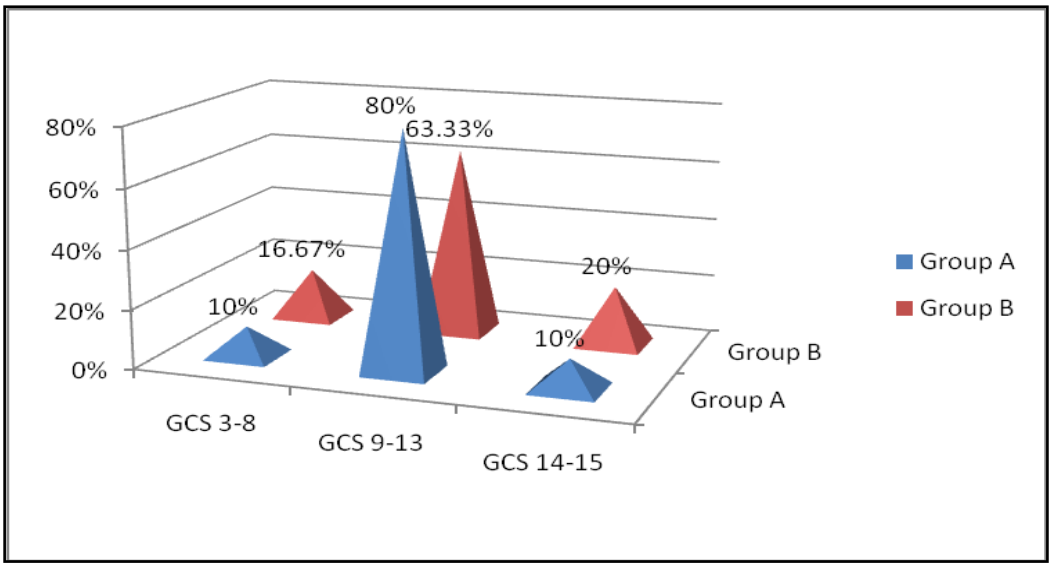

Table V: Distribution of outcome of EDH by GCS in group A

GCS	Glasgow outcome scale		p value
	Moderate disability	Good recovery	
3-8	3 (60%)	0 (0%)	0.001
9-13	2 (40%)	22 (88%)	
14-15	0 (0%)	3 (12%)	
Total	5 (100%)	25 (100%)	

Table VI: Distribution of outcome of EDH by GCS in group B

GCS	Glasgow outcome scale		p value
	Moderate disability	Good recovery	
3-8	1 (33.3%)	4 (14.8%)	0.541
9-13	2 (66.7%)	17 (63%)	
14-15	0 (0%)	6 (22.2%)	
Total	3 (100%)	27 (100%)	

Table VII: Distribution of the patients by postoperative outcome

		Group A (Regional scaip block)	Group B (General Anaesthesia)
At discharge	**Good recovery**	25 (83.3%) 5(16.7%)*	27(90%) 3 (10%)
At one month from discharge	**Moderate disability**	29 (96.7%) 1 (3.3%)	29 (96.7%) 1 (3.3%)

P value at discharge 0.704

P value at one month from discharge 1.00

Chi square test (after Yates's Correction) was done to measure the level of significance

Table VIII: Shows the postoperative complications of patients

	Group A (Regional scalp block)	Group B (General Anaesthesia)	p value
Surgical site infection	3 (10%)	1 (3.3%)	0.605
Aspiration pneumonia	0 (0%)	2 (6.7%)	0.472

Chi square test (after Yates's Correction) was done to measure the level of Significance

Statistically significant difference was observed between outcome (moderate disability and good recovery) in group A by GCS (P<0.05).

Table VI shows that in group B out of all patients with moderate disability 33.3% had GCS 3-8, 66.7% had GCS 9-13 and in patients with good recovery 14.8% had GCS 3-8 and 63% had GCS 9-13 and 22.2% had GCS 14-15. Statistically no significant difference was observed between outcome (moderate disability and good recovery) in group B by GCS (P>0.05).

Table VII shows that at discharge, in group A 83.3% had a good recovery, 16.7% had a moderate disability and in group B 90.0% had a good recovery and 10.0% had a moderate disability. Two group had no significant difference considering the outcome at discharge (p=0.704).

After one month, in group A, 96.7% had a good recovery, *3.3 % had a* moderate disability and in group B outcome was same as group A *(p=1.0).*

Table VIII shows that Three (10.0%) in group (A) and 1 (3.3%) in group (B) had wound infection, none of group A and 2 (6.7%) group B had aspiration pneumonia. There were no significant differences between two groups considering postoperative complication (p>0.05).

DISCUSSION

Head injury encompasses various forms: concussion, contusion, laceration, diffuse axonal injury, pneumoecphalus, extradural hematoma (EDH), subdural haematoma (SDH), burst lobe, depressed fracture and so on. As many as 100,000 patients per year may require surgical management for a posttraumatic intracranial haematoma in the United States.[5]

In Chowdhury et al (2008) series highest number of patients were in the third decade (29%) followed by second decade (27.55%), only 4.92% were above the age of 50 years. The current study found similarity with the study of Chowdhury et al (2008).[6]

In Debnath et al (2007), series RTA was the most common cause of EDH followed by assault and others.[7] EDH usually occurs in young adults and is rare before age 2 years or after age 60 years. Perhaps the dura is more adherent to the inner table in these groups. In this study, age ranged from 16 to 68 years. In group A, 40% belonged to age 26-35 years followed by age 16-25 years that was 35.33%. In group B 36.67% beloned to age 16-25 years followed by age 26-35 years that was 33.33%. Male-female ratio in group-A was 1.7:1 and group-B was 3.2:1. Ayub and Ilyas (2005) found male to female ratio of 5:1. Males were more victimized due to more exposure.[8] Though females were less

affected, working females were more commonly affected group in Bangladesh. This study shows mode of injury in majority cases were RTA in both groups and other causes were fall from height and assault. According to Ramzan et al (2002), RTA was responsible for 50% cases and remaining 50% cases due to domestic fall.[9] This result also shows similarity with the present study. In the current study patients of group-A and group-B presented with unconsciousness (86.7%, 83.3%), vomiting (96.7%, 100.0%), convulsion (16.7%, 10.0%) and headache (10%, 20%), which is similar to the study conducted by Zink (2001). In the present study, in group A most of the EDH was located in parietal region (43.3%) and in group B, in temporo-parietal region (40.0%), whereas in Debnath et al (2007), study the commonest site of EDH was at fronto-temporo-parietal region. Thirty-one out of thirty five patients, EDH were located in temporo-parietal region in Husain et al (2007) series. According to this study EDH was highest percentage in the parietal and temporo-parietal region, which is comparable to other studies. In this series in group A out of all patients with moderate disability 60% had GCS 3-8, 40% had GCS 9-13 and in patients with good recovery 88% had GCS 9-13 and 12% had GCS 14-15. In group B out of all patients with moderate disability 33.3% had GCS 3-8, 66.7% had GCS 9-13 and in patients with good recovery 14.8% had GCS 3-8 and 63% had GCS 9-13 and 22.2% had GCS 14-15. Among both the groups whose GCS was good had better outcome. Debnath et al (2007), evaluated surgical outcome of 30 EDH cases under GA, showed good recovery in 26 (86.6%) patients, 2 (6.6%) patients had residual neurological deficit (One had visual field defect and one had psychological disturbance).

In this study, three of group A and one of group B had wound infection, none of group A and two of group B had aspiration pneumonia. There was no significant difference between two groups considering postoperative complication. However, two (6.6%) patients died on 3 and 6 postoperative day respectively due to aspiration pneumonia in Debnath et al (2007) series. No death occured in the present study. At discharge, among regional scalp block cases 16.7% had a good recovery, 83.3% had a moderate disability and among cases under GA 10.0% had a good recovery and 90.0% had a moderate disability. Two groups had no significant difference considering outcome at discharge. After one month, among regional scalp block cases 3.3 % had a good recovery, 96.7% had a moderate disability and among the cases under GA the outcome was same as scalp block. In this study the surgical out come under regional scalp block was comparable with that of under GA.

Considering that the surgical outcome and postoperative complication of extradural hematoma under regional scalp block (RSB) was not significantly different than that of under general anaesthesia, so, RSB can be recommended as a suitable and safe anaesthetic procedure in EDH surgery.

CONCLUSION

The current study was conducted to evaluate the surgical outcome of extradural hematoma (EDH) done under regional scalp block (RSB), comparing with that of under general anaesthesia. The recovery after EDH surgery under RSB at discharge and at 1st month was comparable with that of under GA. There was no significant difference regarding the incidence of postoperative complication between two groups. Thus, from this study it can be recommended that surgery under RSB is effective, safe and suitable for extradural hematoma.

- Large prospective study to evaluate the efficacy and safety of regional scalp block in EDH surgery should be conducted.
- Further study should be carried out to set a criteria so that extradural hematoma surgery can be done in neurotrauma centers throughout the country.

REFERENCES

1. Husain M, Ojha BK, Chandra A et al. Contralateral motor deficit in extradural hematoma: Analysis of 35 patients. Indian Journal of Neurotrauma. 2007; 4(1): 41-44.

2. Sanders MJ and McKenna K. Head and Facial Trauma. In Mosby's Paramedic Textbook. 2nd revised Ed. Mosby 2001; pp 322-330.

3. Greenberg MS. Head injury in hand book of Neurosurgery by Greenberg MS eds 4th edn, Florida, Green Berg Graphics 1997; pp: 727-729.

4. Borozone M, Gantiles, Perriac et al. Epidural Hematoma. Surgical Neurology 1979; 11:277-284.

5. Mass AI, Stocchetti N and Bullock R. Moderate and sever traumatic brain injury in adults. Lancet Neurology. 2008; 7 (8): 728-741

6. Chowdhury NKSM, Raihan MZ, Chowdhury FH et al. Surgical management of traumatic extradural haematoma: Experiences with 610 patients and prospective analysis, Indian Journal of Neurotrauma. 2008;5(2):75-79.

7. Debnath H, Rahman ML, Rashid H et al. Surgical outcome of extradural Haematoma Patients at Department of Neurosurgery in Chittagong Medical College Hospital: A Study of 30 Patients. Teachers Association Journal of Chittagong Medical College 2007; 20 (2):136-139.

8. Ayub S, Ali M and Ilias M. Acute Extradural Haematoma: Factors affecting the outcome. Journal of Postgraduate Medical Institute. 2005; 19(2): 208-211.

9. Ramzan A, Wani A, Malik AH et al. 'Short Reports; Acute bilateral extradural haematoma. Neurology India. 2002; 50: 217-218.

Source of Support: Nil. **Conflict of Interest:** None Declared.

Cite this article as: Md. Jahangir Alam, Md. Tofael Hossain Bhuiyan, Md. Shafiul Alam, Md. Moajjam Hossain Talukder, Md. Shafiqul Islam, Sukriti Das, Raziul Haque. Surgical Outcome of Extradural Haematoma Done Under Regional Scalp Block. Int J Med Res Prof. 2017 Nov; 3(6):190-94.
DOI:10.21276/ijmrp.2017.3.6.038