WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.453
Volume 13, Issue 21, 36-45. Research Article ISSN 2277–7105

OUTCOME OF TRAUMATIC SMALL SIZE EPIDURAL HEMATOMA VERSES LARGE SIZE EPIDURAL HEMATOMA: A DESCRIPTIVE STUDY

Saleem Khan*, Ghulam Mustafa, Abid Hussain, Sher Hassan Khan, Nasrullah Lango, Noor Ahamed

*Assistant Professor, Department of Neurosurgery Bolan Medical College/BMCH, Quetta.

Article Received on
17 September 2024,

Revised on 07 October 2024,
Accepted on 27 October 2024

DOI: 10.20959/wjpr202421-34306

***Corresponding Author**
Dr. Saleem Khan
Assistant Professor
Department of Neurosurgery
Bolan Medical
College/BMCH, Quetta.

ABSTRACT

Introduction: Traumatic brain injury (TBI) is becoming the most common cause of death and disability worldwide. Currently the incidence of head injury is 50 per 100,000 population in Pakistan and it is rising rapidly with increasing trend in the use of motor vehicles and the use of warfare as the current geopolitical situations. Extradural Haematoma is one of the most serious neurosurgical emergencies following head injury which is surgically treatable and carries a good prognostic outcome after operation. It could be defined as the accumulation of blood in the space between the skull bone and underlying dural membrane. EDH occurs in approximately 1-3% of patients with head injuries and in 5-15% of patients with severe head injuries. Aim of the study is to see the effects of the haematoma size (volume) on the overall outcome of patients as measured by using the functional capabilities of an individual in terms of the (GOS) as the guide. It will help us better understand the effect of haematoma size on the outcome of patients with extradural haematoma. **Objective:** To determine the Outcome of traumatic small size epidural hematoma verses large size epidural hematoma. **Setting:** Department of Neurosurgery, Bolan Medial College /BMCH, Quetta. **Study design:** Descriptive case series. **Duration of the study:** From March 2022 to February 2023. **Material and Methods:** This study was conducted at Department of Neurosurgery, Bolan Medial College /BMCH, Quetta in which a total of 188 patients were observed by using 39.3% favourable outcome in large volume haematoma group3, 95% confidence level, 7% margin of error with the help of WHO software. More over non-probability consecutive sampling technique was used for sample

collection. **Results**: In this study 32% patients were in age range 20-30 years, 28% patients were in age range 31-40 years, 22% patients were in age range 41-50 years, 18% patients were in age range 51-60 years. Mean age was 33 years with SD ± 2.71. Seventy five percent patients were male while 25% patients were female. Seventy three percent patients had extradural hematoma 25-50 mL while 27% patients had extradural hematoma >50 mL. Twelve percent patients had GOS score (1-3) while 165(88%) patients had GOS score (4-5). Mean GOS was 3 with SD ± 1.34. Eighty eight percent patients had favourable outcome while 12% patients had unfavourable outcome. **Conclusion:** There is a strong correlation of outcome in extradural hematoma with its size. The outcome of extradural hematoma was affected by hematoma size. In small hematoma there was a good outcome but in large size hematoma the prognosis was poor.

KEYWORDS: Extradural/epidural haematoma (EDH), GOS, haematoma size (volume), outcome.

INTRODUCTION

Traumatic brain injury (TBI) is becoming the most common cause of death and disability worldwide. Currently the incidence of head injury is 50 per 100,000 population in Pakistan and it is rising rapidly with increasing trend in the use of motor vehicles and the use of warfare as the current geopolitical situations.[1,2]

Extradural Hematoma (EDH) is one of the most serious neurosurgical emergencies following head injury which is surgically treatable and carries a good prognostic outcome after operation. It could be defined as the accumulation of blood in the space between the skull bone and underlying dural membrane. EDH occurs in approximately 1-3% of patients with head injuries and in 5-15% of patients with severe head injuries. Its incidence decreases with increasing age and have a male to female ratio in the range of 4:1 to 10:1 in different studies. Computed tomography (CT) scan is the investigation of choice for diagnosis, management planning and determining other intracerebral traumatic lesions.[3,4] EDH can be fatal rapidly especially if the bleeding vessel is large or if other intracerebral traumatic lesion is associated.[5,6]

Craniotomy has been favored in most studies as surgical approach due to the wide exposure and being less traumatic in terms of decreased bone loss. In rapidly deteriorating patients

with suspected EDH, a CT scan is inappropriate, and a burr hole is placed ipsilateral to the side of pupillary dilatation and contra lateral to the side of motor signs.[7,8,9,10]

Epidemiologic and hospital based studies have taken into account the various factors which affect the outcome of patients in surgically operated patients of EDH. These factors however, have always remained the subject of widespread research in order to improve the various phases of the neurotrauma patient's endeavor from prehospital rescue to the neuro-intensive care inside the high dependency units.[11,12]

The study by Mushtaq et al into the outcome of EDH in relation to the haematoma volume showed that outcome in terms of GOS was associated significantly with volume of hematoma. They categorized EDH as large volume (50 mL to 100 mL) and smaller volume (25 mL to 50 mL). In this study 39.4% of patients showed favourable outcome in the smaller volume haematoma group while 39.3% of favourable outcome in large volume haematoma group.[3]

Keeping in mind the still deficient understanding of TBIs and their outcome, this study will be conducted in order to better understand the effects of haematoma volume on the outcome in terms of GOS. This study will analyze the effects of the haematoma size (volume) on the overall outcome of patients as measured by using the functional capabilities of an individual in terms of the Glasgow Outcome Score (GOS) as the guide. It will help us better understand the effect of haematoma size on the outcome of patients with extradural haematoma.

Sampling technique: Consecutive non-probability sampling

Exclusion criteria: Patient with postoperative extradural hematoma, Patient with recurrent extradural hematoma. Patient with spontaneous extradural hematoma

METHODOLOGY

The study was conducted after approval from hospital ethical and research committee. All patients meeting inclusion criteria (patients having traumatic extradural hematoma received within 24 hours after trauma, Both Genders, Age of 18 to 65 years) i.e. all patients with traumatic EDH were included in study through emergency and OPD. The purpose and benefits of the study was explained to the patient/guardian/relative and an informed consent was obtained. All the patients were worked up with detailed history and clinical examination and diagnosis confirmed using CT of the brain followed by routine investigations. Surgical planning was established with the help of assessment by a Neurosurgeon with a minimum

five years post-fellowship experience. Patients will be followed post-operatively till discharge and was assessed by a Neurosurgeon with a minimum five years post-fellowship experience either as favorable outcome or unfavorable outcome according to the GOS. Observation and examination was done by trainee medical officer and data was recorded in a predesigned Pro-forma. To control confounders and bias in the study results, exclusion criteria had followed strictly. Exclusion criteria will all those Patient with postoperative extradural hematoma, Patient with recurrent extradural hematoma. Patient with spontaneous extradural hematoma. All the above mentioned information including name, age, gender and address was recorded in a pre-designed proforma.

The data was analyzed using the statistical program SPSS version 20.0. Descriptive statistics like mean ± standard deviation was calculated for quantitative variables like age, volume of haematoma. Frequency/percentages were calculated for categorical variables like gender, and outcome (favourable and unfavourable) according to GOS. Outcome was stratified among age, gender and volume of haematoma. Post stratification was done through chi-square test keeping p value less than or equal to 0.05. All results were presented in the form of charts and graphs.

RESULTS

This study was conducted at Department of Neurosurgery, Bolan Medical College Quetta/BMCH in which a total of 188 patients were observed to determine the outcome of traumatic extradural haematoma in terms of Glasgow outcome scale and compare outcome of the small and large size extradural haematoma. The results were analyzed as:

Age distribution among 188 patients was analyzed as 60(32%) patients were in age range 20-30 years, 53(28%) patients were in age range 31-40 years, 41(22%) patients were in age range 41-50 years, 34(18%) patients were in age range 51-60 years. Mean age was 33 years with SD ± 2.71. (as shown in table no 1)

Gender distribution among 188 patients was analyzed as 141(75%) patients were male, 47(25%) patients were female. (as shown in table no 1)

Volume extradural hematoma among 188 patients was analyzed as 137(73%) patients had extradural hematoma 25-50 mL while 51(27%) patients had extradural hematoma >50 mL. (as shown in table no 1)

GOS score among 188 patients of extradural hematoma was analyzed as 23(12%) patients had GOS score (1-3) while 165(88%) patients had GOS score (4-5). Mean GOS was 3 with SD ± 1.34. (as shown in table no 1)

Outcome of extradural hematoma among 188 patients was analyzed as 165(88%) patients had favourable outcome while 23(12%) patients had unfavourable outcome. (as shown in table no 2)

Stratification of outcome with age, gender and volume of extradural haematoma is given in table no 3, 4, 5,

Table no. 1: Age, Gender, Hematoma volume, Glasgow outcome score distribution.

Age	**Frequency**	**Percentage**	**Mean** ± Sd
20-30 years	60	32%	2.71
31-40 years	53	28%	
41-50 years	41	22%	
51-65 years	34	18%	
Gender			
Male	141	75%	--
Female	47	25%	
Hematoma volume			
Small (25- 50 mL)	137	73%	11.83
Large (> 50 mL)	51	27%	
Gos			
1 - 3	23	12%	1.34
4 -5	165	88%	
TOTAL	188	100%	

Table no 2: Outcome.

Outcome	**Frequency**	**Percentage**
Favorable	165	88%
Un Favorable	23	12%
Total	188	100%

Table no. 3: Stratification of outcome with age.

Outcome	**20-30 years**	**31-40 years**	**41-50 years**	**51-65 years**	**Total**
Favorable	53	46	36	30	165
Un Favorable	7	7	5	4	23
Total	60	53	41	34	188

Chi Square test was applied in which P value was 0.9949

Table no. 4: Stratification of outcome with gender.

Outcome	Male	Female	Total
Favorable	124	41	165
Un Favorable	17	6	23
Total	141	47	188

Chi Square test was applied in which P value was 0.8977

Table no. 5: Stratification of outcome with hematoma volume.

(n=188)

Outcome	Small (25-50 mL)	Large (> 50 mL)	Total
Favorable	120	45	165
Un Favorable	17	6	23
Total	137	51	188

Chi Square test was applied in which P value was 0.9046

DISCUSSION

Extradural Hematoma (EDH) is a serious complication of head injury. While the exact incidence is unknown, it is found in 2.7-4% of traumatic head injury cases. The incidence of EDH is rare in extremes of age; is higher in men as compared to women and is highest among adolescents and young adults. Head injury is the leading cause of death among individuals younger than 45 years. In almost two-thirds of patients with head injuries, traumatic brain injury is the main cause of protracted disability and / or death. Skull fractures are present in 75-95 percent of patients. The mortality of EDH varies from 10-40% and is inversely related to the level of hospital facilities. With early diagnosis and prompt intervention, the mortality from EDH can be reduced thereby improving the outcome in many patients.

In this study 32% patients were in age range 20-30 years, 28% patients were in age range 31-40 years, 22% patients were in age range 41-50 years, 18% patients were in age range 51-60 years. Mean age was 33 years with SD ± 2.71. Seventy five percent patients were male while 25% patients were female. Seventy three percent patients had extradural hematoma 25-50 mL while 27% patients had extradural hematoma >50 mL. Twelve percent patients had GOS score (1-3) while 165(88%) patients had GOS score (4-5). Mean GOS was 3 with SD ± 1.34. Eighty eight percent patients had favourable outcome while 12% patients had unfavourable outcome.

Similar findings were observed in study conducted by Mushtaq et al into the outcome of EDH in relation to the haematoma volume showed that outcome in terms of GOS was

associated significantly with volume of hematoma. They categorized EDH as large volume (50 mL to 100 mL) and smaller volume (25 mL to 50 mL). In this study 39.4% of patients showed favourable outcome in both the smaller volume haematoma group while 39.3% of favourable outcome in large volume haematoma group.[3]

Similar findings were observed other studies as 3% by McKissock et al[99] and 1.6% by Jamieson and Yelland.[13] Extradural hematoma is prevalent in young adult males with a male to female ratio of 4:1 as shown by Oertal M et al.[14] But there was a significantly high incidence in our study as male to female ratio was 13:1, which may be due to the traditional way of life in Pakistan, where women usually restrain from outdoor life. The greater exposure of males to all kind of trauma undoubtedly explains these results.

Our study shows that road traffic accidents were the commonest (50%) cause of extradural hematoma in the present study as also indicated in the study of Servadei F et al[15] to be 70%. The incidence of assaults is relatively less common in various international studies but in the present study, assault was responsible for a good bulk i.e. 21%. It was followed by head injuries due to falls (16%).

The observation of classical signs like deterioration in conscious level, hemiparesis and pupils difference, were found to be extremely important from the diagnostic point of view. However, most cases were not seen to behave in the classical way. Only two patients presented with these three signs together. Jamieson and Yelland also found this picture in 2.4% of their patients to be as high as 26% and Jamieson and Yelland showed it to be 12%.[13] So the description of lucid interval as the only sign for extradural hematoma seems to be overemphasized.

In one series, it was seen that up to 40% patients of extradural hematoma did not present with localizing signs or deterioration in conscious level.[16] Therefore, it is important to realize the facts pointed out by Teasdale et al,[17] that it is essential to break away from the tradition that a traumatic intracranial hematoma is diagnosed only after there has been progressive deterioration.

Similar findings were observed in another study conducted by Aurangzeb A et al[18] in which a total of 114 patients were included. Among these patients 85 (74.5%) were male and 29 (25.4%) were female patients. Age of the patients ranged from 2 to 70 years with mean age of

18.23±16.5 years. Among these patients the most important cause of head injury was fall from height in 65(57%) patients, followed by road traffic accidents in 39 (34.2%), and assault in 10 (8.8%) patients. Fall from height was common in age ranges 2–20 years in 57 (50%) of patients, while road traffic accidents was common in the age ranges 10–45 years in 28 (24.5%) of patients, and assault was common in the age ranges 28–60 years in 7 (6.1%) of patients. The most commonly fractured bone of skull was parietal in 49 (43%) of patients, followed by frontal bone in 28 (24.6%), occipital in 24 (21.1%), and temporal was fractured in 23 (20.2%) of patients.

Frequency of extradural hematoma among linear skull fracture was in 34 (29.8%) of patients. Frequency of extradural hematoma among linear skull fractures was 23.2% among 2–15years of age, 40% among 16–35 years of age, 36.8% among 36–60 years of age, and 100% above 60 years of age. Frequency of Extradural hematoma among parietal fractures was in 17 (48.9%) of patients, among temporal was in 8 (23.5%) of patients, among occipital fractures was in 4 (11.7%), and frequency of extradural hematoma among frontal bone fractures was in 6 (17.6%) of patients. So extradural hematoma among skull fractures was common in parieto-temporal regions is 73.5% as compared to frontal and occipital regions.

CONCLUSION

There is a strong correlation of outcome in extradural hematoma with its size. The outcome of extradural hematoma is affected by hematoma size. In small hematoma there was a good outcome but in large size hematoma the prognosis is poor.

REFERENCES

1. Aenderl I, Gashaw T, Siebeck M, Mutschler W. Head injury-a neglected public health problem: a four-month prospective study at Jimma University specialized hospital, ethiopia. Ethiop J Health Sci, 2014; 24(1): 27-34.
2. Xiao B, Wu FF, Zhang H, Ma YB. A randomized study of urgent computed tomography-based hematoma puncture and aspiration in the emergency department and subsequent evacuation using craniectomy versus craniectomy only. J Neurosurg, 2012; 117(3): 566-73.
3. Mushtaq, Rehman L, Khaleeq S, Zaman KU. Association of outcome of traumatic extradural hematoma with Glasgow Outcome Scale and hematoma size. Ann Pak Inst Med Sci, 2010; 6(3): 133-8.

4. Rehman L, Khattak A, Naseer A, Mushtaq. Outcome of acute traumatic extradural hematoma. J Coll Physicians Surg Pak, 2008; 18(12): 759-62.
5. Mezue WC, Ndubuisi CA, Chikani MC, Achebe DS, Ohaegbulam SC. Traumatic extradural hematoma in Enugu, Nigeria. Niger J Surg, 2012; 18: 80-4.
6. Bhau KS, Bhau SS, Dhar S, Kachroo SL, Babu ML, Chrungoo RK. Traumatic extradural hematoma-role of non surgical management and reasons for conversion. Indian J Surg, 2010; 72: 124-9.
7. Jung SW, Kim DW. Our experience with surgically treated epidural hematomas in children. J Korean Neurosurg Soc, 2012; 51(4): 215-8.
8. Huisman TA, Tschirch FT. Epidural hematoma in children: do cranial sutures act as a barrier?. J Neuroradiol, 2009; 36(2): 93-7.
9. Ghizoni E, Fraga AMA, Baracat ECE, et al. Indications for head computed tomography in children with mild traumatic brain injury. Rev Col Bras Cir, 2013; 40(6): 515-9.
10. Hasler RM, Srivastava D, Aghayev E, Keel MJ, Exadaktylos AK, Schnuriger B. First results from a Swiss level I trauma centre participating in the UK Trauma Audit and Research Network (TARN): prospective cohort study. Swiss Med Wkly, 2014; 13, 144: w13910.
11. Saidi H, Mutiso BK, Ogengo J. Mortality after road traffic crashes in a system with limited trauma data capability. J Trauma Manag Outcomes, 2014; 8(1): 4.
12. Paiva WS, Andrade AF, Alves AC, Ribeiro IN, Teixeira MJ. Bilateral acute epidural hematoma with good outcome. J Clin Diagn Res, 2013; 7(11): 2594-5.
13. Jamieson KG, Yelland JND. Extradural Hematoma: Report of 167 Cases. J Neurosurgery, 1968; 29: 13-23.
14. Oertel M, Kelly DF, McArthur D, Boscardin WJ, Glenn TC, Lee JH,Gravori T. Progressive hemorrhage after head trauma: J Nenrosurg, 2002; 96: 109-16.
15. Servadei F, Faccani G, Rocella P, Seracchioli A, Godano U, Ghadirpour R, et al. Asymptomatic extradural haematomas. Results of a multicentre study of 158 cases in minor head injury. Acta Neurochir Wien, 1989; 96: 39-45.
16. Servadei F, Piazza G, Serrachioli A, Acciari N, Pozzati E, Gaist G. Extradural Hematoma: An analysis of the changing characteristics of patients admitted from 1980-1986.Diagnostic and therapeutic implications in 158 cases. Brain Inj, 1988; 2: 87-100.
17. Teasdale G, Galbraith S, Murray L, Ward P, Gentleman D, McKean M. Management of Traumatic Intracranial Hematoma. Br Med J, 1982; 285: 1695-7.
18. Aurangzeb A, Afridi EAK, Khan SA, Muhammad G, Ihsan A, Hussain L, et al.

Frequency of extradural haematoma in patients with linear skull fracture. J Ayub Med Coll Abbottabad, 2015; 27(2): 1-4.