

## ORIGINAL ARTICLE

# Surgical Outcome of Traumatic Brain Injury: A Retrospective Experience of 2 Months at Lahore General Hospital Lahore

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## ABSTRACT

**Introduction:** Traumatic head injury is a common cause of death in the young population. It is important public health care problem in Pakistan and equally pandemic in developing countries. By knowing prognostic factors, proper management, and avoiding the cause, and also by public awareness we can decrease mortality and morbidity.

**Material and Methods:** A retrospective study conducted in the Neurosurgery department of Lahore general hospital Lahore, from 1<sup>st</sup> Nov. 2018 to 31<sup>st</sup> Dec. 2018 and data collected from 30 patients. All patients were of traumatic head injury after that they suffer from ICH/SDH/EDH. All patients who had brain death or suffer from poly-trauma were excluded from research. Prognosis was assessed from GCS, age, CT scan findings. Patients having GCS less than 4 were considered having poor prognosis. Serial imaging were taken to see the progression of the disease.

**Results:** Out of 30 patients, 5 patients are female and 25 patients are males. Mean age of patients is 34 years. Age group 30 – 45 have maximum numbers of patients. RTA is a major cause of mortality in our study, particularly for those patients having low GCS i.e., 4. In this study nearly 66.7% patients had post traumatic fits. 46.7% patients had skull fractures. 16.7% patients had EDH 33.3% patients had SDH and 50% patients had contusion/DAI/TSAH.

**Conclusion:** Prognosis in the severe head injury is determined by the age, mode of the injury, CT findings, resuscitation, and GCS.

**Abbreviations:** EDH: Extradural haematoma. Dai: Diffuse Axonal Injury.

## INTRODUCTION

Traumatic brain injury is becoming the major cause of death and disability in big cities of Pakistan. The primary and secondary Use and Injury Phenomenon is shown in Table 1.

**Table 1:** The Brain Injury Types.

PRIMARY INJURY (at time of injury)	SECONDARY INJURY (hours, to days, to weeks)
1. Due to force associated with mechanism	1. Cellular mechanism and microenvironment changes of further

-fall -motor vehicle accident -assault	dysfunction
2. Coup- Contrecoup - contusions	2. Astrocyte foot swelling - breakdown of the blood-brain barrier
3. Shearing of blood vessels -epidural, subdural hematomas	3. Gliosis
4. Rotational forces	4. Glutamatergic release

causing axonal shearing -diffuse axonal injury	-activation of NMDA and AMPA receptors
	5. Cellular depolarization
	6. Excitotoxicity
	7. Mitochondrial dysfunction
	• Ca space cascade

### Classification of Head Injury

The patients who have GCS score 19 to 17 are considered moderate, 1 those patients who have GCS score 14 to 15 are considered as having mild injury. 3 Severe head injury are those with GCS 3-8.

### General Management

As with all patients, the approach to individuals with suspected traumatic brain injury begins with history taking and physical examination if he or she is stable.<sup>11,12.</sup>

### MATERIAL AND METHODS

It was study of 30 patients who were operated in Lahore General Hospital Lahore Neurosurgery Unit 1. Study span was 2months and follow-up period was 20 days.

### RESULTS

Age range was 6-65 years and average age was 38 years.

### Sex Incidence

25 patients were male and 5 patients were female.

**Table 3:** *clinical summary of 30 patients of TBI.*

Case	Age (Years)	Sex	Neurological Deficits	Duration (Hours)
1	38	Male	9/15 GCS	2
2	45	Male	10/15 GCS	5
3	10	Male	11/15 GCS	3
4	17	Male	8/15 GCS	4
5	40	Male	4T/15 GCS	7
6	62	Male	10/15 GCS	1

**Table 2:** *Gender Distribution*

Sex	No of patients	Percentage
Female	5	16.67
Male	25	83.33
Total	30	100

### Epidural Hematoma

Out of 30 patients, 5 patients presented with EDH. Epidural hematoma is located between the inner table of the skull and the dura, most commonly in the temporal or temporoparietal regions.<sup>23</sup>

### Subdural Hematoma

Out of 30 patients, 10 patients presented with SDH. SDH occur most frequency from a tearing of bridging veins between the cerebral cortex and the draining sinuses.<sup>25,26,27</sup>

### Contusions/Intracerebral Hemorrhage

Out of 30 patients, 15 patients presented with contusions. Most contusions occur in the frontal and temporal lobes, although they can occur at almost any site.

### Surgical Procedures

In all patients' surgery, the diagnostic tool was CT before and after surgery. Post-op CT scan was performed 72 hours after surgery to see and re-bleed and brain edema due to surgery.

7	17	Male	13/15 GCS	8
8	42	Male	7/15 GCS	4
9	22	Male	6T/15 GCS	3
10	26	Male	4T/15 GCS	6
11	6	Male	15/15 GCS	2
12	14	Male	10/15 GCS	5
13	48	Male	9/15 GCS	3
14	25	Female	10/15 GCS	3
15	35	Male	12/15 GCS	1
16	25	Male	3T/15 GCS	4
17	35	Male	10/15 GCS	2
18	25	Female	11/15 GCS	5
19	33	Female	8/15 GCS	2
20	45	Male	6T/15 GCS	4
21	45	Male	10/15 GCS	3
22	50	Male	15/15 GCS	5
23	33	Male	8/15 GCS	6
24	35	Male	14/15 GCS	4
25	27	Female	10/15 GCS	3
26	43	Male	12/15 GCS	2
27	45	Male	9/15 GCS	3
28	17	Male	4T/15 GCS	1
29	45	Male	10/15 GCS	5
30	27	Male	13/15 GCS	5

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**Table 4:** Feature of Raised ICP.

Vomiting	No.	Percentage
> 5	25	83.3
< 4	15	16.7

**Table 5:** Post Traumatic Fits.

Fits	No.	Percentage
Present	10	66.7
Absent	20	33.3

**Table 6:** CT Findings.

CT	No.	Percentage
SDH	10	33.3
EDH	5	16.7
Contusion	15	50
Fractures	14	46.7
Raised ICP	3	10

**Table 7:** Midline Shift.

Shift mm	No.	Percentage
< 1.5	20	66.7

1.5 – 3	8	26.6
> 3	2	6.7

**Table 8:** *Outcome.*

Status	No.	Percentage
Improved	23	76.7
Disability	4	13.3
Expired	3	10

## DISCUSSION

In neurosurgical emergency department of Lahore general hospital Lahore/PINS/PGMI, we collected data of 30 patients who underwent surgery after TBI.

In our study 30 patients were included out of which 4 patients were females and 26 were males. The age range was 6-62 years. Majority patients were in between age 30-45 years.

All patients included in our study underwent surgery. We tried to operate as soon as we can do according to patient's clinical and imaging status. Six patients operated within 2 hours, twenty one patients were operated within 5 hours and three patients were operated within 8 hours. Those patients who operated soon yield good outcomes as compared to those who operated late. In our study, 23 patients improved without any neurological deficit, 4 patients undergone disability and 3 patients expired.

In our study, 26 patients had the history of vomiting, and 4 patients did not so. Only 10 patients suffered from post-traumatic fits and rest of 20 patients did not show these features.

CT scan was mode of diagnosis for our cases. CT scan was performed immediately upon arrival of patients in the emergency. And after 4 hours, if the clinical status of the patient deteriorates, then again CT scan was repeated. In CT scan of the patients, SDH was present in 10 patients, EDH was present in 5 patients, Contusion was present in 15 patients, skull fractures were present in 14 patients and raised ICP was present in 3 patients. Midline shift was present in all patients of our study.

Upon arrival of the patients in the emergency, resuscitation done, then surgery performed. After performing surgery, up to 20 days was the follow-up time.

## CONCLUSION

The use of helmet while driving a motorbike decreased the number of head injuries. The prognosis in TBI is determined by the age of the patient, pupils, mode of head injury, post resuscitation clinical status, CT scan findings and co-morbidities. A poor outcome is observed in patients having GCS 4T/15, in age less than 15 and greater than 60 years, midline shift greater than 3 mm, and patients having co-morbidities.

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