

## Admission characteristics and outcome in traumatic brain injury patients: a preliminary report from a tertiary care hospital

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**Abstract:** *Introduction.* Traumatic brain injury (TBI) is affected by multiple factors. Patient's education, manifesting symptoms and surgical management play a significant role on discharge outcome. The literature of same from developing country is limited. The present pilot study aims to describe patient characteristics, presenting symptom and management aspects of TBI patients from a tertiary hospital. *Methods.* The present study is a prospective study, where TBI patients were selected and data of injury was entered on standard proforma on electronic data base. The study was approved by institute ethical board. The data was analyzed using Stats Direct version 3.0.150 software. *Results.* Three hundred and thirty three patients were evaluated. Eighty percent of patients were from rural areas. About 75% of patients were illiterates and married. Patient employment was significant with discharge outcome. All the patients manifested with symptoms loss of consciousness (LOC) was higher (73%) followed by vomiting (44%). LOC and oral bleed was significant with outcome. Associated injuries was higher in extremities (22.5%) followed by chest (4.4%). About 15% of patients require intracranial surgery that was significant with discharge outcome. *Conclusion.* The present pilot study finding is similar to available literature data and adds knowledge to TBI data of a developing country like India.

**Key words:** illiterate, loss of consciousness, oral bleed, intracranial surgery, TBI, outcome

## Introduction

The injury characteristics for traumatic brain injuries (TBIs) differ in important ways that has significant effect on outcome. (1, 2) The details of distribution of injured patient's occupation and their marital status may be essential for outcome. (3, 4) Outcome has significant association with manifesting symptoms like duration of loss of consciousness and oral bleed. (5) The management of TBI patient especially intra cranial surgery is very crucial for patient outcome. (6) The details of published data of above mentioned variables of TBI from our local environment are limited. The aim of the present pilot study is to describe the injured patients educational, presenting symptoms and treatment characteristics of traumatic brain injuries from our setting.

## Methods

The present study is a prospective study. The head injury patients attending emergency center of Narayana Medical College and Hospital, Nellore, Andhra Pradesh (India) was randomly selected. The study was approved by institute ethical committee and consent was taken by patient or by stander. The patient's data was entered on standard head injury proforma which was comparable with Computerized Patient Management System. Patient's data was mainly focused on education, employment, marital status, presenting symptoms and management aspects. The mentioned variable was checked for any significance with discharge outcome. The details of all variables was entered in

simultaneous electronic data entry interface developed by FileMaker Pro Advanced 13 (Copyright © 1994-2015, FileMaker, Inc) and web data entry interface Drupal CMS.

## Statistical analysis

The study data was analyzed using StatsDirect version 3.0.150 (StatsDirect Ltd. StatsDirect statistical software. <http://www.statsdirect.com>. England: StatsDirect Ltd. 2015). Frequencies and percentages were reported for categorical variables. Mean and standard deviation was reported for continuous variables. The significance between discharge outcome (alive or dead) and mentioned variables was analyzed using chi square test. The significant level was <0.05.

## Results

Totally 337 head injury patients were evaluated during the study period. Twenty four (7.12%) patients expired during study period. The mean age was  $36.26 \pm 15.86$  years. Males were four times more than females. Fifty percent of patients had moderate to severe head injury. The details of patient's education, employment and marital status with outcome are detailed in table 1. Only employment status was significantly associated with patient outcome. Table 2 highlights manifesting symptoms, other injuries, duration of LOC, pulse rate and systolic blood pressure with outcome. The medical and surgical management of head injury patients and their discharge outcome is shown in Table 3.

**TABLE 1**  
**Patients' educational, occupational and marital status with outcome**

SI No.	Variables	Outcome		P value
		Alive	Dead	
1	<b>Education</b>			0.732
	Illiterate	225	19	
	Primary	41	3	
	Secondary	8	1	
	Graduate	19	0	
	Unknown	8	1	
2	<b>Employment</b>			0.007*
	Farmer	132	9	
	Student	19	1	
	Laborer	16	0	
	Employee in service	4	0	
	Unemployed	2	2	
	Housewife	10	3	
	Unknown	5	0	
3	<b>Marital status</b>			0.867
	Married	262	21	
	Unmarried	50	3	
	Widow	1	0	

\*p value <0.05

**TABLE 2**  
**Symptoms and signs presentation with outcome**

SI No.	Variables	Outcome		P value	
		Alive	Dead		
1	<b>Symptoms (present)</b>				
	LOC	228	21	0.115	
	Vomiting	138	11	0.868	
	Ear bleed	125	13	0.172	
	Nasal bleed	108	11	0.263	
	Oral bleed	43	7	0.040*	
	Headache	52	2	0.287	
	Seizures	22	3	0.324	
	Post Traumatic Amnesia	14	2	0.391	
	2	<b>Duration of LOC</b>			
		1-29 minutes	176	4	

	30-59 minutes	60	11	0.021*
	1-7 days	4	0	
	None	73	4	
3	<b>Other injuries (present)</b>			
	Neck	10	1	0.769
	Thorax	4	1	0.259
	Chest	13	2	0.339
	Abdomen	1	0	0.782
	Extremities	55	21	0.526
	Cervical spine	1	1	0.018*
	Thoracic spine	2	0	0.694
Lumbar spine	1	0	0.782	
4	<b>Pulse rate</b>			0.016*
	<60 beats per minute	13	4	
	61-100 beats per minute	211	13	
	>100 beats per minute	43	6	
5	<b>Systolic Blood Pressure</b>			0.834
	<90	14	1	
	>90	258	23	

LOC - Loss of consciousness; \*p value <0.05

**TABLE 3**  
**Treatment with outcome**

SI No.	Variables	Outcome		P value
		Alive	Dead	
1	<b>Medical treatment</b>			
	Urinary catheter	180	22	0.001*
	Nasogastric tube	58	12	0.001*
	Tetanus toxoid	215	20	0.132
	Crystalloids	108	10	0.478
	Colloids	179	15	0.612
	Blood transfusion	1	0	0.782
	Cervical collar	12	3	0.047*
	Cervical traction	1	0	0.782
	Bed rest	246	18	0.68
	Steroids	2	0	0.076
Ventilation	39	7	0.022*	
2	<b>Surgery</b>			
	Intra cranial	40	9	0.003*
	Extra cranial	17	2	0.576

\*p value <0.05

## Discussion

The study results report that majority of evaluated patients were illiterates (72.4%). Farmers were about 37.4%. Three fourth (75%) of patients were married. All the patients manifested with symptoms among them loss of consciousness (LOC) was majorly reported (73.8%), followed by vomiting (44.2%), ear nose bleed (41%) and oral bleed (14.8%). Post traumatic amnesia was reported in 4.7%. Duration of LOC and oral bleed was significant with discharge outcome ( $p < 0.05$ ). Other than head extremities, chest and neck reported among 22.5%, 4.4% and 3.2% respectively. Pulse rate was significant with discharge outcome. Intracranial surgery was significant with discharge outcome.

The study was conducted from a tertiary care hospital located in heart of the city. The hospital receives patients from local and surrounding areas. Majority of patients were from rural areas (81%). Our study reports that nearly three fourth of patients were not educated and there was no significance with outcome at discharge. A cross sectional study among moderate to severe TBI patients reveal that higher education reduces the negative effect of TBI on cognitive outcome. Patients with higher intellectual enrichment had positive on outcome. (7) About eighty five percent of patient's age was above twenty years, so it's obvious that 75% were married. TBI literature from both developed and developing countries reports that productive age group is commonly affected. The occupation of majority of patients were agriculture (37.4%) followed by 6% of students

and 5% of labor class. As majority of patients are from rural set up where agriculture is main mode of occupation. A district level study of traumatic brain injury patients reported that students were higher (29%) followed by civil servants (16%) and casual labors (13%). (3)

Patients with TBI manifest with spectrum of symptoms. (8) TBI studies from India reports that brain injury patients manifest about 63% of LOC, 48 to 40% of vomiting, 36% of ear, nose and throat bleed and 24% of traumatic amnesia. (8) The present study result reflects the literature results, but the post traumatic amnesia is less in our study as compared to above study. The post traumatic amnesia manifests for varying duration. (9) It may be due to the fact that the patients with low education might not have understood or have failed to understand.

LOC and its duration have significant association with outcome, longer the LOC duration worse the outcome. (10) Our study reports duration of LOC has significance with outcome at discharge. The study reports that oral bleed has significance with discharge outcome. Forty three percent of severe patients, 19% of moderate patients and 9% of mild group patients had oral group that was significant ( $p < 0.001$ ). A retrospective study from Taiwan reports that severe the head injury patients with oronasal bleed had worse outcome. (11)

Associated injuries like involvement of neck, thoraco-abdominal, extremities and spine are common in TBI patients. Our study reports associated injuries was higher in extremities (22.5%) followed by chest and neck. A TBI study from tertiary care center

reports higher neck injuries (95%), extremities on average of 32% and chest of 4.5%. (12)

The management of patients with head injury is complex and requires a prompt, coordinated, comprehensive and multidisciplinary approach. Early recognition and immediate treatment of surgically correctable intracranial lesion is essential for optimal patient outcome. (3, 14) The present study reports that intracranial surgical management of TBI patient was significant with discharge outcome.

### **Limitation**

The present study sample size is small with lack of data on long-term outcome. The statistics used are simple one, higher statistics like logistics to find detail association and risk factor that has significance with discharge outcome was not done.

### **Conclusion**

The pilot study reports that majority of patients were illiterates and married. LOC was present among majority of patients and was significant with discharge outcome. Associated injuries were present in majority of patients. Intracranial surgery was significant with discharge outcome. Studies with larger sample size and higher statistics should be considered to establish better prevention strategies and treatment protocols.

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