



Research Article

Evaluation of Incidence, Mode of Injury and Clinical Outcomes of Traumatic Brain Injury in Tertiary Health Center in Southern Rajasthan

Authors

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Abstract

According to WHO, Traumatic Brain Injury (TBI) will be one of the major cause of mortality, morbidity and disability by the year 2020. Since burden of TBI is manifest throughout the world but it is especially prominent in India which faces a high preponderance of risk factors for causes of TBI.

Aims and Objectives: *To evaluate incidence, mode of injury, clinical outcomes and surgical intervention of TBI in Tertiary Health Center in Southern Rajasthan.*

Material and Method: *For the study, 1000 patients of TBI who were admitted to Department of Neurosurgery ICU of Geetanjali Medical College and Hospital, Udaipur during the period of January 2014-November 2017 were evaluated. Clinical status of patients was grossly assessed with Glasgow Coma Scale (GCS).*

Result: *Among 1000 patients, mean age was found to be 27.61 ± 4.89 years. 74.3% were males and 25.7% were females. Among total cases, 28.3% had severe, 11.1% had mild and 60.0% had mild injury. Mortality in patient with severe injury was 44.17% and only 5.41% expired having moderate injury. RTA was found to be most common mode of injury 47.4%. 51.2% had Scalp laceration, 41.9% with Contusion and 41% had Skull Fractures. Regarding surgical intervention, surgery was most common*

Keywords: *Traumatic Brain Injury, Road Traffic Accidents, Mortality, Glasgow coma scale, Computerized Tomography Scan.*

Introduction

Traumatic Brain injury (TBI) not only has considerable morbidity and mortality, but it is a major cause of epilepsy. TBI is defined as an alteration in brain function manifest as confusion, altered level of consciousness, seizures, coma or focal sensory or motor neurologic deficit resulting from blunt or penetrating force to the head. In mild TBI, subtle behavioral and neuropsychological changes may be only

symptom.¹ TBI is estimated to be the primary cause of death in one third to one half of the traumatic deaths.² Thus TBI constitutes a major health and socioeconomic problem throughout the world.^{3,4} It is prevalent in both low and high income people and affects people of all ages. TBI is called the 'silent epidemic' because problem resulting from TBI are often not immediately visible, and TBI patients are not very vociferous. The term silent further reflects the common

underestimation of the actual incidence and that society is often unaware of the impact of TBI.⁵

Material and Method

The study was carried out in the Department of Neurosurgery at Geetanjali Medical College and Hospital, Udaipur during the period of January 2014 - November 2017. For the study total of 1000 patients with Traumatic Brain Injury from Intensive Care Unit (ICU) were included. Clinical Status of patients was assessed using Glasgow Coma Scales. Computerized Tomography scan was done of all TBI patients.

Observation and Results

Out of total patients majority 74.3% were males. 41.6% of patients were students followed by 23.8% of Farmers. Regarding socioeconomic status 48% patients were from middle class followed by 44.9% of Lower class and only 7.1% patients were of Higher Class. 52.6% were from rural area and 47.4% were from urban area. Table 1

It was observed that most commonly affected group belonged to age group of 21-40 years (41.9%) followed by patients in age group of 1-10 years (20.8%). mean age of injured patients was found to be 27.61 ± 4.89 years Regarding mode of

injury, Road Traffic Accident was found to be most common cause of injury (47.4%) followed by injury due to fall from height in 31.9%. 14.3% of injury was due to Assault. Out of 474 cases of injury due of RTA, 264 (55.7%) were of age group of 21-40 years. Out of 319 cases due to fall from height 155(48.59%) were of age group 1-10 years and out of 143 assault cases 52 (36.36%) were of age group 41-50 years. Table 2

Overall mortality was found to be 13.1%. Out of 100 cases, 606(60.6%) were mild, 283(28.3%) were severe and 111(11.1%) were moderate TBI. According to GCS out of 283 cases with severe TBI 125(44.17%) while mortality in 111 moderate cases was 6(5.41%) and not a single patient with mild TBI expired. Table 3

It was observed that there was direct correlation between findings of CT scan and increase in number of symptoms. Out of total 1000 cases, 512(51.2%) had Scalp laceration, 419(41.9%) with Contusion and 410(41%) had Skull Fractures. Among the systemic injuries Raccon eye was in 22.9% followed by long bone injury in 16.3%. Table 4.

Regarding surgical intervention, surgery was most common and done in 55% of cases followed by 51.8% Craniotomy and 41% Duraplasty. Lobectomy was done only in 4.6% cases. Table 5

Figure 1: Distribution of case according to age

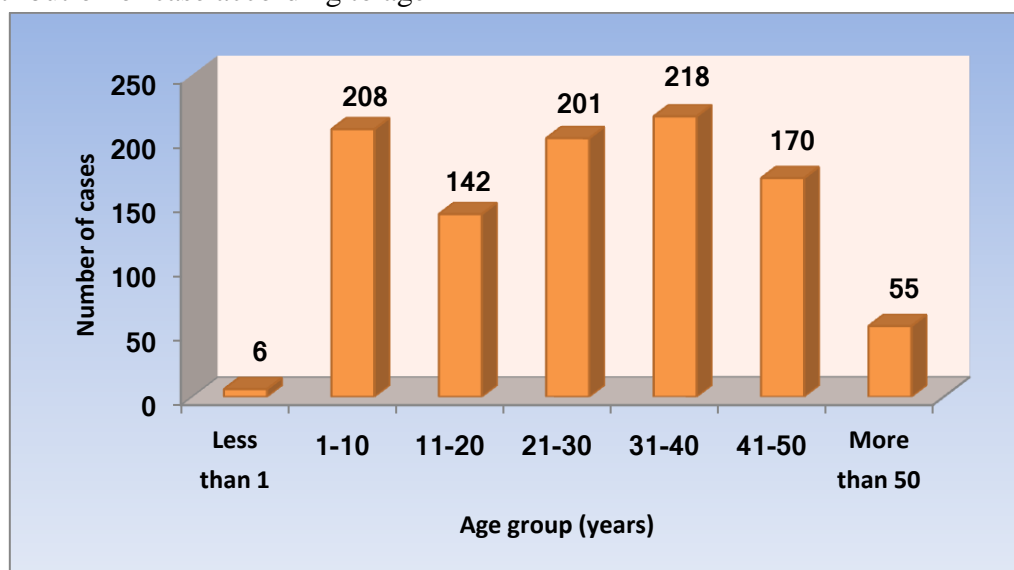


Figure 2: Distribution of cases according mode of injury

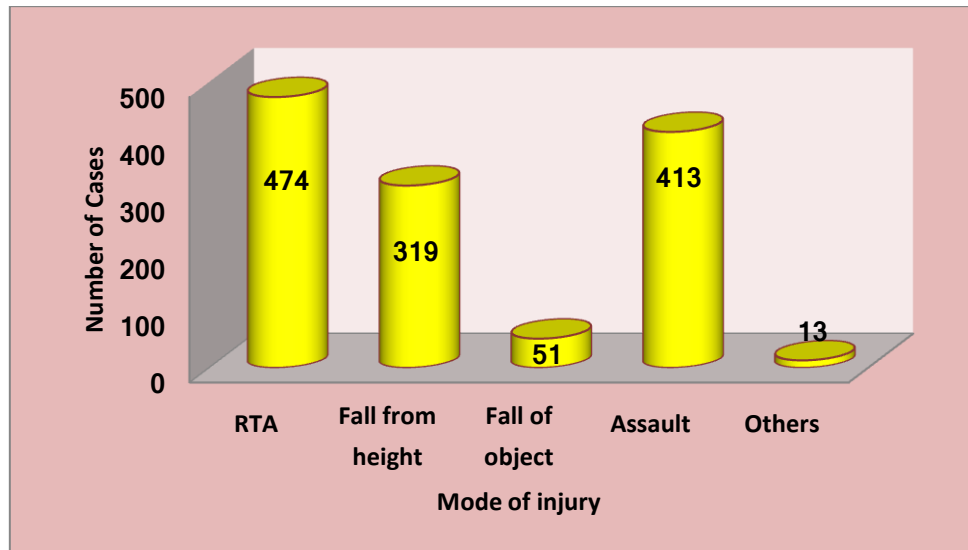


Figure 3: Outcome of TBI

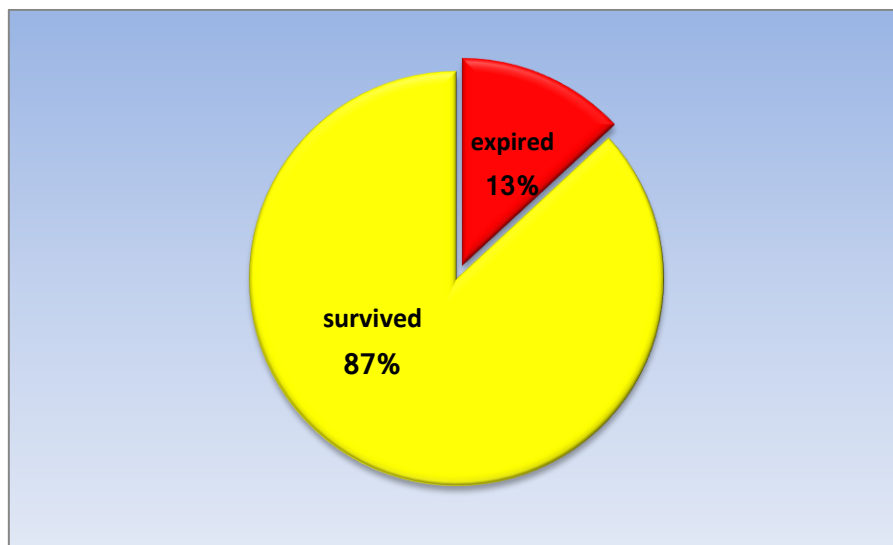


Table 1: Demographic profile of study subjects

Variables		Number of subjects	Percentage
Gender	Male	743	74.3
	Female	257	25.7
Occupation	Students	416	41.6
	Service	180	18.0
	Business	36	3.6
	Retired	13	1.3
	Farmer	238	23.8
	Others	117	11.7
Socioeconomic Status	Upper	71	7.1
	Middle	480	48.0
	Lower	449	44.9
Area of living	Rural	526	52.6
	Urban	474	47.4

Table 2: Distribution of Mode of Injury according to age

Age group(years)	Mode of Injury					Total
	RTA	Fall from height	Fall of object	Assault	Others	
Less than 1	2 (33.33%)	4 (66.67%)	-	-	-	6 (100%)
1-10	21 (10.1%)	155 (74.52%)	22 (10.58%)	6 (2.88%)	4 (1.92%)	208 (100%)
11-20	83 (58.45%)	28 (19.72%)	3 (2.11%)	28 (19.72%)	-	142 (100%)
21-30	139 (69.15%)	31 (15.42%)	7 (3.48%)	24 (11.94%)	-	201 (100%)
31-40	125 (57.34%)	55 (22.23%)	10 (4.59%)	28 (12.84%)	-	218 (100%)
41-50	73 (42.94%)	29 (17.06%)	9 (5.29%)	52 (30.59%)	7 (4.12%)	170 (100%)
More than 50	31 (56.36%)	17 (30.91%)	-	5 (9.09%)	2 (3.64%)	55 (100%)
Total	474 (47.4%)	319 (31.9%)	51 (5.1%)	143 (14.3%)	13 (1.3%)	1000 (100%)

Table 3: Distribution of GCS score with outcome

GCS score	Outcome		Total (%)
	Expired (%)	Survived (%)	
Severe	125 (44.17%)	158 (55.83%)	283 (100%)
Moderate	6 (5.41%)	105 (94.59%)	111 (100%)
Mild	-	606 (99.83%)	606 (100%)
Total	131 (13.1%)	869 (86.9%)	1000 (100%)

Table 4: Computerized Tomography Scan findings

CT Scan findings	Number of subjects	Percentage
Scalp laceration	512	51.2
Contusion	419	41.9
Skull Fractures	410	41.0
Extra Dural Hematoma	246	24.6
Raccon eyes	229	22.9
Long bone injury	163	16.3
Midline shift	154	15.4
Facial laceration	133	13.3
Subarachnoid Hemorrhage	121	12.1
Pneumocephalous	101	10.1
Maxillofacial Injury	92	9.2
Chest injury	83	8.3
ICH	76	7.6
Acute SDH	61	6.1
Pelvic injury	54	5.4
Cervical spine	39	3.9
Chronic SDH	23	2.3

Table 5: Surgical intervention of Study subjects

CT Scan findings	Number of subjects	Percentage
Surgery	550	55.0
Craniotomy	518	51.8
Duraplasty	410	41.0
Tracheostomy	365	36.5
Brain bulge	305	30.5
Lobectomy	46	4.6

Discussion

In this study most affected group of patient 41.9% belonged to age group of 21-40 years and majority 74.3% of them were males which was similar to the findings of the studies.⁶⁻¹³ In this study RTA was found to be the most common cause of Injury (47.4%) followed by fall from height (31.9%), which is also similar to findings of Gururaj G and Pathak A.^{6, 14}

41.6% of patients were students followed by 23.8% of Farmers. Regarding socioeconomic status 48% patients were from middle class followed by 44.9% of Lower class and only 7.1% patients were of Higher Class. 52.6% were from rural area and 47.4% were from urban area, these findings are close to the findings of Agarwal A.¹⁵

In this study mortality was found to be 13.1%. 60.6% were mild, 28.3% were severe and 11.1% were moderate TBI. According to GCS out of 283 cases with severe TBI, 44.17% expired and in 111 moderate cases was 5.41% patients expired and not a single patient with mild TBI expired. These findings are similar to the findings of Bhole EM.¹⁶ Whereas mortality rate in severe TBI was 33% and 2.5% according to Foulkes MA respectively.¹⁷

In this study, 51.2% had Scalp laceration, 41.9% with Contusion and 41% had Skull Fractures. According to the finding of other studies, incidence of SDH and SAH was most common in injuries due to RTA while EDH was least common whereas in this study EDH was 24.6%.^{7, 16}

Conclusion

Most common cause of TBI is RTA and most of the cases are in productive age group of 21-40 years. This incidence is high due to traffic patterns and lack of preventive measures. Thus it is very essential to provide knowledge about the cause of Head Injury and measure to prevent them from being injured. Knowledge about pattern of TBI may be very useful in making policies for the prevention before and due to injury.

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