



## A Retrospective Observational Study Of Outcome Of Moderate Head Injury With Gcs 9 To 13 In Tertiary Care Centre

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### Abstract

**Background:** The incidences of head injuries are growing with increasing number of high-speed motor vehicle, more movement of the public and mechanization in industry. Glasgow Coma Scale (GCS) has been accepted as the gold standard in neurological assessment of patients. Brain is most important and delicate vital viscera which has created emergency situations requiring early diagnosis and management. Hence the study is required to obtain the data on magnitude, mode, severity, management and its final outcome in tertiary health care Hospital.

**Aims And Objectives:** To study the demographic and traumatic profile of head injury and to evaluate the signs and symptoms presentation of study group. To study the underlying head injury component and management according to standard protocol with outcome and hospital stay.

**Methodology:** This is retrospective observational study of moderate head injury with GCS 9 to 13 reporting at trauma centre & department of general surgery of tertiary care hospital of South Gujarat during the period between 2019 to 2021.

**Result:** In this study, total 50 selected patients as per inclusion criteria were included. There is 42(84%) Male and 8 (16%) female in present case study. Majority of patients who sustained trauma by road traffic accidents 32(64%) it was noted that the majority of patients present with most common presentation (symptoms) was loss of consciousness 38(76%). Present case study 25 patient was managed by operative intervention and 25 patient was conservatively managed Among the study participants, majority had survived and discharge within 7 days.

**Conclusion:** The most head injury patients are young male brought to a tertiary care hospital, with most common presentation (symptoms) with loss of consciousness due to road traffic accidents. Common pathology found on CT scan was extradural haemorrhage with low mortality rate. Majority had survived and discharge within 7 days.

**Keywords:** Road Traffic Accidents, Glasgow coma Scale, Extradural Haemorrhage

### Introduction

It is estimated that nearly 1.5 to 2 million people are INJURED and 1 million succumb to death every year in INDIA. Road traffic INJURIES are the leading cause (60%) of Traumatic Brain Injuries(TBI)

followed by falls (20% -25%) and violence (10%) (1). Head Injury has been defined as, "morbid state, resulting from gross or subtle structural changes in the scalp, skull, and/ or the contents of the skull,

produced by mechanical forces(2). Severity of TBI is classified as mild, moderate and severe according to the level of consciousness is measured by Glasgow coma scale (GCS). The Glasgow Coma Scale rates the patient's level of consciousness from 3 (worst) - 15 (no impairment) based on patient's motor, verbal and eye response which is used to assess severity of traumatic brain injury(3)(4)(5).

Head injuries in two phases; primary and secondary phase. Primary head injury is known to be classified as a closed head injury or a penetrating head injury. Mechanism of injury is Countercoup injury(6). To prevent secondary injury, control of intracranial pressure is essential. Rise of intracranial pressure over 20mmhg is associated with poor outcome, and maintenance of cerebral perfusion pressure of at least 60mmhg is important in preventing secondary injury(7). Classification of traumatic brain injury based on (a) Injury Severity, (b) Pathoanatomic Findings, (c) Biomechanical Mechanism of Injury ,(d) Pathophysiology and (e) Prognostic Modelling(8).

The initial goal of care should be immediate attention to airway and cardiopulmonary function (ABCs); early identification of the potential for traumatic brain injury in any trauma victim and minimization of secondary insults, such as hypoxic-ischemic injury(9). Computed tomography is reliable tool in predicting the outcome of a case of head injury. "It was determined that '...three easy-to identify clinical variables (age, Glasgow coma score and pupil reaction) and two easy-to-identify CT scan variables (presence of Subarachnoid haemorrhage and the overall appearance of the scan) are independent prognostic variables for survival after head injury"(10). Serial CT can reveal changes in the brain over a period of time that can end up with significant predictive value(11).

More aggressive pre-hospital treatment, involving early sedation and intubation, as a factor obscuring the real GCS assessment it may have influenced the relevance of the GCS on outcome over the last five-year Cases of subdural or epidural hematoma or increasing cerebral oedema, require emergency surgery to bring down the intracranial pressure and allow space for the brain to expand. Decompressive craniectomy is the surgery of choice to manage such cases. When studying early prognosis in head injury

patient, it is shown that "the worst Glasgow coma score recorded over a given time period is especially predictive of poorer outcome. Deterioration in neurological function has been defined more objectively as Neuroworsening , and is highly predictive for poor outcome(12).

Patients who were classified by the GOS as either moderately disabled or having good recoveries at 1 year after injury, about 60% already had reached that status by 3 months, while 90% had reached that status by 6 months(13).

### **Aims And Objectives**

1. To study the frequency, demographic and traumatic profile of head injury.
2. To evaluate the signs and symptoms presentation of the study group and identify the underlying head injury component or its complication and further to correlate it with management given according to standard protocol.
3. To conclude the outcome and hospital stay of traumatic head injury in the study groups.

(Trauma Profile includes mode of trauma, type of injury, dimension of injury, exact site of injury, active bleeding present or not, palpable underlying fracture and associated Haemorrhages and Hematomas).

### **Methodology**

This is retrospective observational study of moderate head injury with GCS 9 to 13 reporting at trauma centre & department of general surgery of tertiary care hospital of South Gujarat during the period between 2019 to 2021.

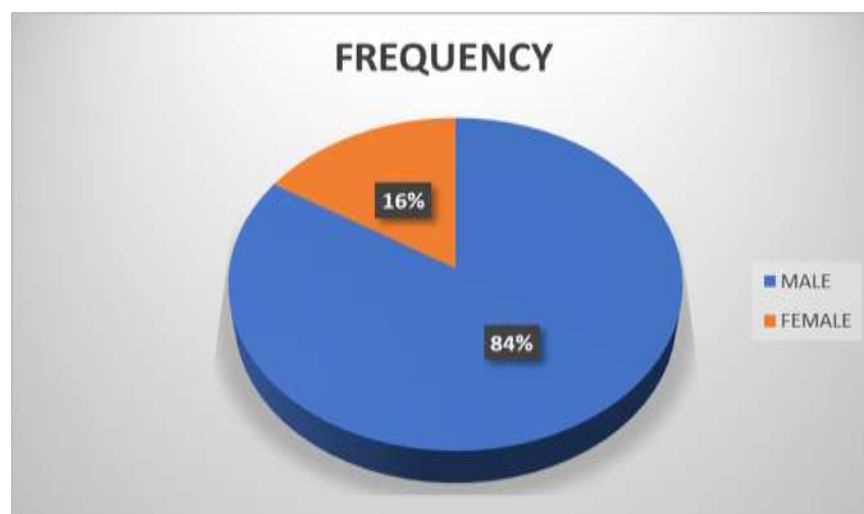
50 patients were selected based on the inclusion criteria and exclusion criteria for the study purpose. Patient's records were collected from the Medical Records Department and it was analysed to study clinical presentation, examination, basic investigations, management, outcome and hospital stay of those patients. Finally, analysis of the collected data will be done. By analysing the data, the age distribution of head injury GCS 9 to 13, its mode of injury, diagnostic pathology, associated findings, treatment modalities, outcome, mortality, and hospital stay was analysed. This study was approved by Institutional Ethical committee of this Institute.

**Results**

**Table – 1: Distribution Of Sample By Sex (N=50)**

SEX	FREQUENCY	PERCENTAGE
MALE	42	84 %
FEMALE	8	16 %
TOTAL	50	100

**Figure 1: Graph Showing Sex Distribution**

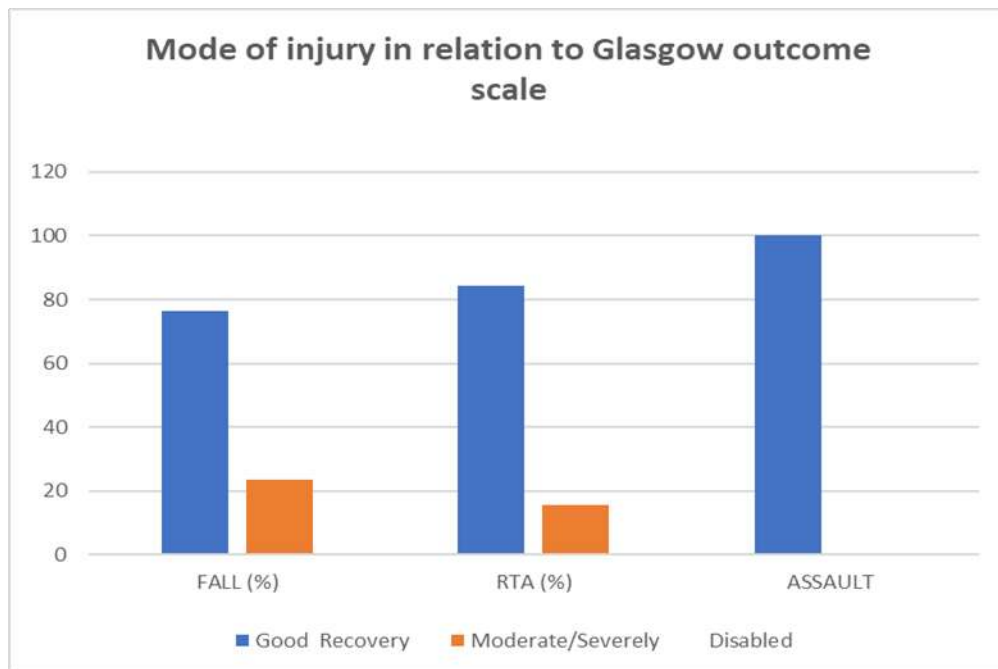


On collection of cases, it was noted that the majority of patients who had come to the emergency department with head trauma were of male gender (42 Male). A total of only 8 patients out of 50 patients were female.

**TABLE - 2 Mode Of Injury In Relation To Glasgow Outcome Scale (N=50)**

Mode of Injury	Glasgow Outcome Scale			TOTAL
	Good Recovery	Moderate/Severely Disabled		
FALL (%)	76.47	23.52		17
RTA (%)	84.37	15.62		32
ASSAULT (%)	100	-		1

**FIGURE -2 : Mode Of Injury In Relation To Glasgow Outcome Scale**

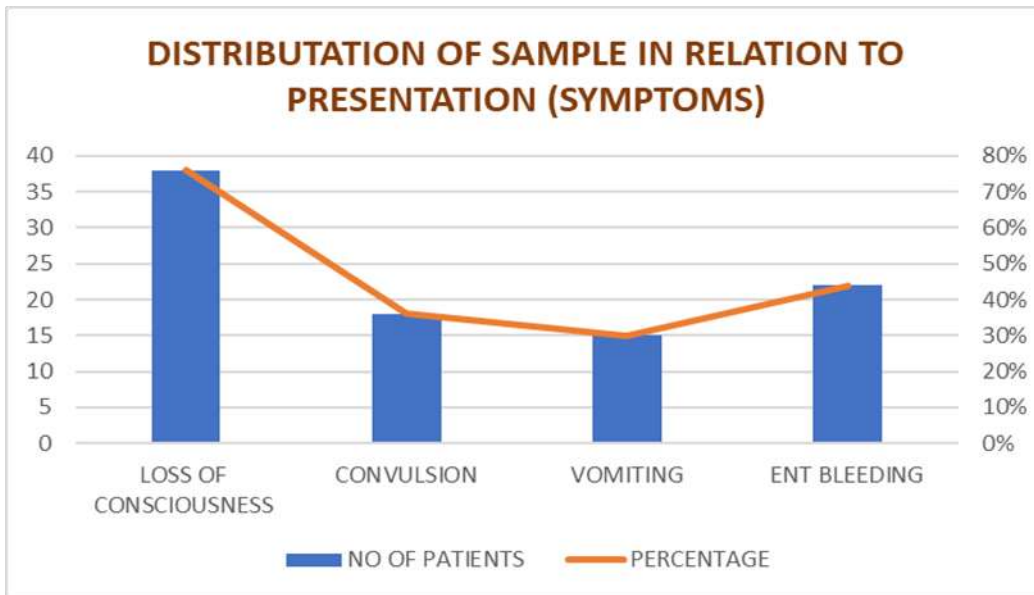


Majority of patients who sustained trauma by road traffic accidents(RTA) was significant with minimum amount of only 15.62% who had moderate/severe disability. This could be due to more trauma caused by collision than by fall down.

**Table - 3: Distribution Of Sample In Relation To Presentation (Symptoms) (n=50)**

SYMPTOMS	NO OF PATIENTS	PERCENTAGE
LOSS OF CONSCIOUSNESS	38	76 %
CONVULSION	18	36 %
VOMITING	15	30 %
ENT BLEEDING	22	44 %

**FIGURE 3: Graph Showing Distribution Of Sample In Relation To Presentation (Symptoms).**

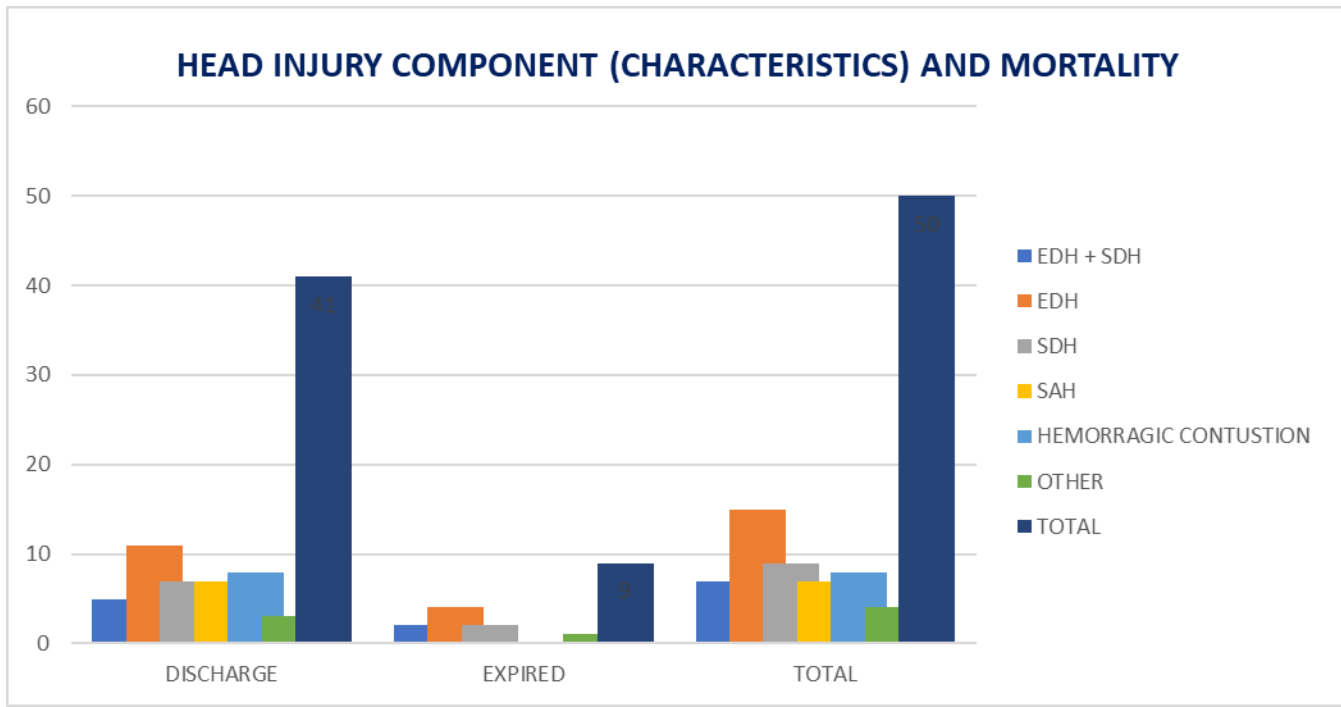


In this study, it was noted that the majority of patients who had come to the emergency department with head trauma were present with most common presentation (symptoms) with loss of consciousness (76%) followed by ENT bleed (44%), convulsion (36%) and vomiting (15%).

**TABLE - 4: HEAD INJURY COMPONENT (CHARACTERISTICS) AS PER NCCT SCAN BRAND MORTALITY (N=50)**

HEAD INJURY COMPONENT	DISCHARGE	EXPIRED	TOTAL
EDH	11	4	15
EDH + SDH	5	2	7
SDH	7	2	9
SAH	7		
HEMORRAGIC CONTUSTION	8		
OTHER	3	1	4
TOTAL	41	9	50

**Figure 4: Head Injury Component (Characteristics) And Mortality**



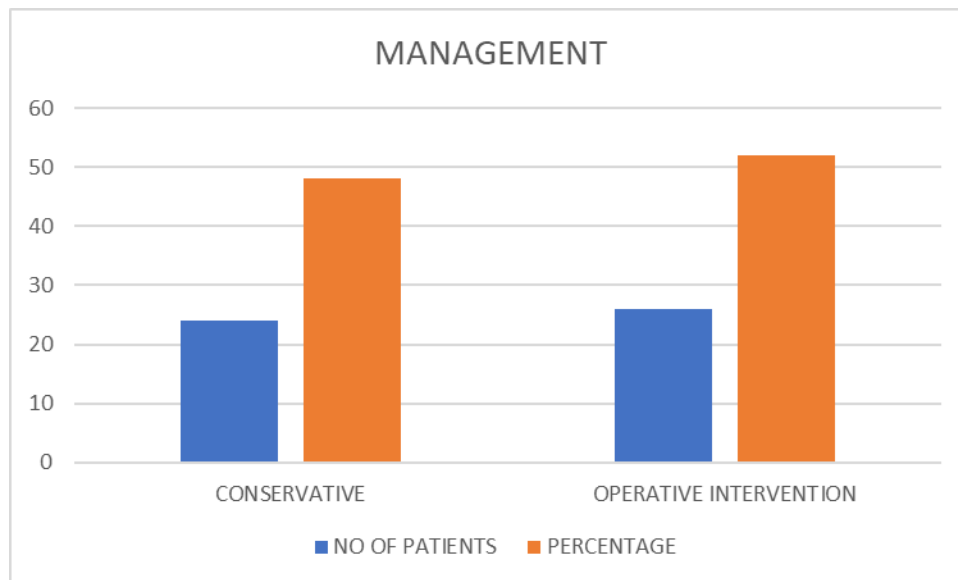
Out of 50 patients, extradural haemorrhage was observed in 22 patients out of which 15 cases were isolated EDH while remaining 7 patients were patients of EDH associated with other traumatic brain pathology. Mortality was observed in 4 patients out of 15 patients of EDH. Mortality was lower i.e., 26 % in EDH group compared to other traumatic brain pathology 28.58 %.

Out of 50 patients, subdural haemorrhage was observed in 16 patients out of which 9 cases were isolated SDH while remaining 7 patients were patients of SDH associated with other traumatic brain pathology. Mortality was observed in 2 patients out of 9 patients of SDH.

**TABLE - 5 DISTRIBUTION OF SAMPLE BY MANAGEMENT (N=50)**

MANAGEMENT	NO OF PATIENTS	PERCENTAGE
CONSERVATIVE	24	48
OPERATIVE INTERVENTION	26	52

**FIGURE -5: Graph Showing Distribution Of Sample By Management**

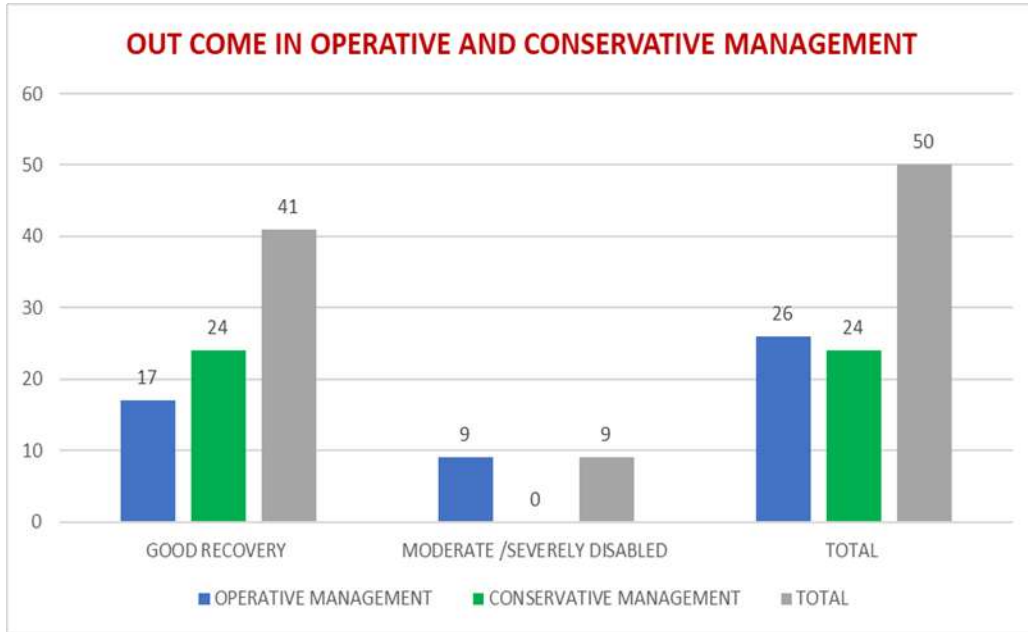


There is Present case study 25 patient was managed by operative intervention and 25 patient was conservatively managed.

**TABLE: 6 OUT COME IN OPERATIVE AND CONSERVATIVE MANAGEMENT (N=50)**

MANAGEMENT	GOOD RECOVERY	MODERATE /SEVERELY DISABLED	TOTAL
OPERATIVE INTERVENTION	17	9	26
CONSERVATIVE MANAGEMENT	24	0	24
TOTAL	41	9	50

**Figure -6: Out Come In Operative And Conservative Management**



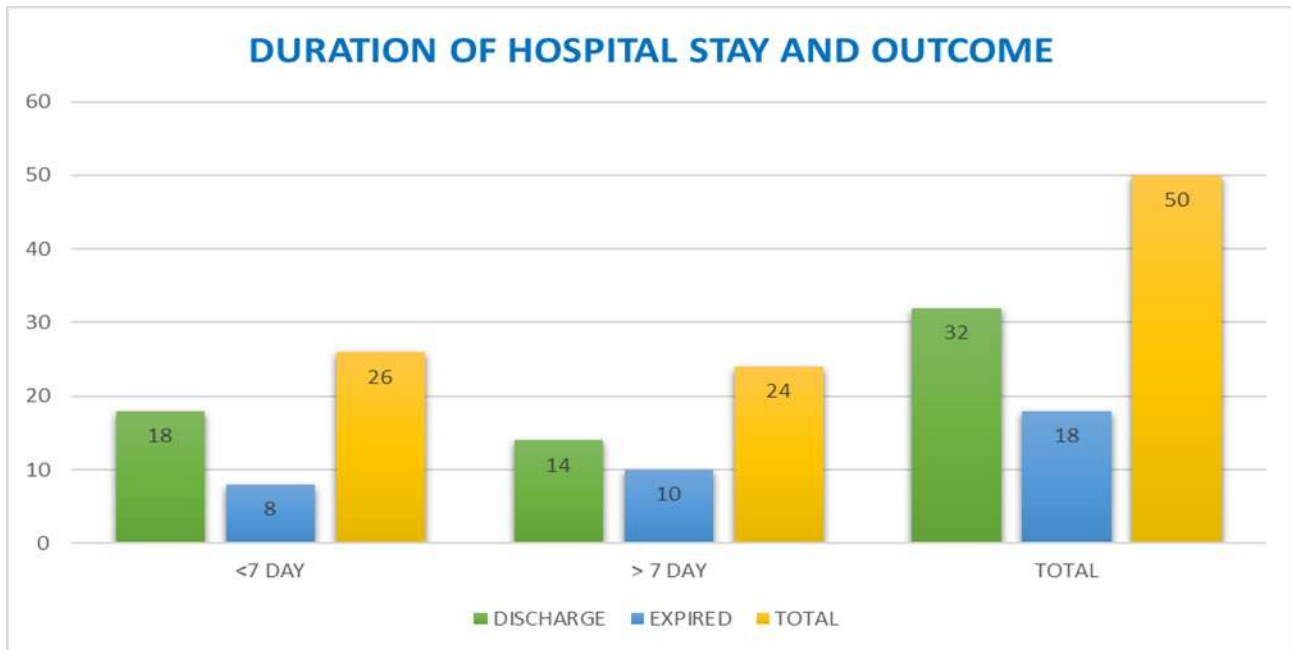
Among the study patients, outcome of 17 patients are good recovery and 9 patients has moderate /severely disabled after operative intervention.

**TABLE 7: DURATION OF HOSPITAL STAY AND OUTCOME (N=50)**

HOSPITAL STAY	DISCHARGE	EXPIRED	TOTAL
<7 DAY	18	8	26
> 7 DAY	14	10	24
TOTAL	32	18	50



**Figure -7: Duration Of Hospital Stay And Outcome**



**Discussion**

With exploding population, increasing numbers of automobile vehicle, encroachment of roads, tendency of violating traffic rules and traffic systems have greatly contributed rapid increase in head injury due to the road traffic accident. The incidence of Traumatic Brain Injury is expected to continue with rising owing to the aging of the baby boomer generation, medical and technological advancement and key public health initiatives that contributes to active lifestyles and increasing life expectancy.

There were 12 patients in age group <25 year and 38 patient in age group >25 years. Among the 9 patients expired, 6 patients were in age group <25 year and 3 patients were in age group >25 year. The difference in mortality rate between the younger and elderly group was statistically insignificant in present study. In our study, mortality rate is in younger age group and in elder age group. In the study done by Agrawal A. et al(14) in 2016, mortality in elderly group was 17 and in younger age group it was 15%. Similar studies done by Shekhar C. et al(15) in 2014 also

found the same trend of mortality rate in the elderly age group.

RTA is the most common mode of trauma in all age groups with overall incidence of around (64 %), followed by Fall down (34%), assault (2%) and unknown (0%) The results are comparable with the previous studies done by Agrawal A. et al(14), Shekhar C. et al(15), , Kumar L. et al(16), Modi A.D et al(17).

Majority of patients who sustained trauma by road traffic accidents (RTA) was significant with minimum amount of only 15.62% who had moderate/severe disability. It can be concluded that mode of injury in head injury patients did not show to be of significance with regard to the final Glasgow Coma Scale (GCS). The results are comparable with the previous studies done by Kodliwadmth H. B. et al(18).

Majority had survived and discharge within 7 days. (n=18), While 10 patients with moderate GCS score with associated injuries expired after 7 days. No significant association between duration of hospital stay and outcome of the patients

## Conclusion

1. The observation of the study showed that most head injury victims, brought to a tertiary care hospital, were due to road traffic accidents.
2. The Traumatic brain injury is present more in young age group than in elderly age group.
3. Male predominance is observed in traumatic brain injury.
4. RTA remains the most common cause for Head injury and demands good neurosurgical care for such patients. So, it warrants the urgency to establish good pre-hospital care and provision of efficient and prompt trauma services at Road side to prevent mortality aroused from RTA.
5. In this study, it was noted that the majority of patients who had come to the emergency department with head trauma were present with most common presentation (symptoms) with loss of consciousness followed by ENT bleed, convulsion and vomiting.
6. Common isolated pathology found on CT scan study was extradural haemorrhage and subdural haemorrhage respectively correlated with low mortality rate.
7. Majority had survived and discharge within 7 days.

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