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Recovery in Patients with Traumatic Brain Injury an Observational Study

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ABSTRACT:
Introduction: Traumatic brain injury(TBI) accounts one-quarter to one-third of accidental deaths and for 2/3rds of trauma deaths in hospitals.[1]Traumatic brain injuries are one of the main reasons for death in recent years worldwide. It affects the brain functions and is currently one of the crucial concerns of global public health issues .Following head injury, individuals develop unconsciousness, sensory, behavioural, cognitive and physical disorders. The Glasgow coma scale (GCS)has been adapted into categories to detect the severity[mild,moderate,severe,] and are ubiquitous in the trauma setting.This study is to revise the GCS categories to account for an interaction by age and to determine the discrimination of the categories compared with the standard GCS categories[2].The study was been conducted to evaluate the recovery of patients following head injury with GCS categorization and Rancho Los Amigos(RLA).
Method: A prospective observational study was conducted in SVIMS hospital from March 2023 to June 2023.Demographic details, CT findings, GCS score,RLA were studied.
Objectives : The Purpose of this study is to find the recovery of patients with TBI and to establish standard protocol for treatment in the field of physiotherapy in ICU.
Results: 60 patients with head injury were included in the study ,who were admitted to the hospital Majority of TBI'S were with the age group of 20-45 years.Malesand females were also included . The most common mechanism of injury was due to motorcycle accidents followed by assault . The overall mortality was 8 males (3),females(5) in the present study.Patients were classified as Mild, Moderate, Severe depending onGlasgow Coma scale. The Mean Length of stay of the patients is 6.4 days. The RLA score I-IV (6) , V- VIII(42) at the time of discharge.

Keywords: Traumatic brain injury, CT findings, Glasgow coma scale, Rancho Los Amigo Score.

INTRODUCTION:

A traumatic Brain injury happens after a bump, blow, or jolt to the head .TBI otherwise known as acquired brain injury or head injury causes substantial disability or mortality.Head injury accounts for1/4th-1/3rd of accidental deaths and for 2/3rds of trauma deaths in hospitals.[3]
Traumatic Brain injuries are one of the main reasons for death in recent years globally .Itaffectsthe brain functions and is currently one of the crucial concerns of major cause of death and disability. In India, about 1.5-2 million persons are injured and more than a million succumb to death every year.[4]

TYPES AND GRADES OF TBI:

There are several types and grades of TBI, Concussions are one of the most prevalent types ofTBI.Every year 3 out 4 are Concussions.People who suffer from mild TBI may suffer e confusion for about a day, which is different from attention and memory problems ,Modest TBI is second level of TBI in which less than 30 minutes of loss of consciousness arecommon,confusion may last for about a week. Another type of TBI is Severe TBI with this type of TBI one can loose consciousness about a day.

Most TBI are closed type ,A closed TBI means an outside force causes a blow or impact to the head that doesnot penetrate the skull,In open TBI a bullet ,knife ,or other objects penetrate into the skull and causes damage to the brain is increasing worldwide because of depending on motorized vehicles and machinery.[5]

Practically the clinical severity of TBI has long been stratified according to GCS into mild, moderate andsevere .TBI can cause significant physical psychosocial and social disturbances up to 60 percentage.Following head injuries individuals develop unconsciousness, sensory, behavioural cognitive and physical disorders[6]

The true consequence of TBI go beyond occurrence or fatality ,and are better reflected in measures of burden i.e. years of lost life and years lived with disability.[7]RTA s are one of the leading cause of head injuries. Alcohol consumption is known to be one of the cofounding factors for TBI's in recent times

Other causes include people ignoring safety measures like not wearing helmets, seat belt etc…this not only affects the rider but also the pavilion rider who is at risk which may sometimes leads to his/her death and affect their family .There are other numerous factors that judge the outcome in head injury patients like age,gender,Severity of injury and intracranial pathology.People involved in certain professions or activities have a higher risk of TBI's including

*Athletes
*Construction workers
*Military members
*Police and law enforcement

It is estimated that nearly 1 million people are injured and nearly 1,000,000 require rehabilitation services every year in India

AIM OF THE STUDY

To determine the alterations of consciousness and cognition inTBI patients

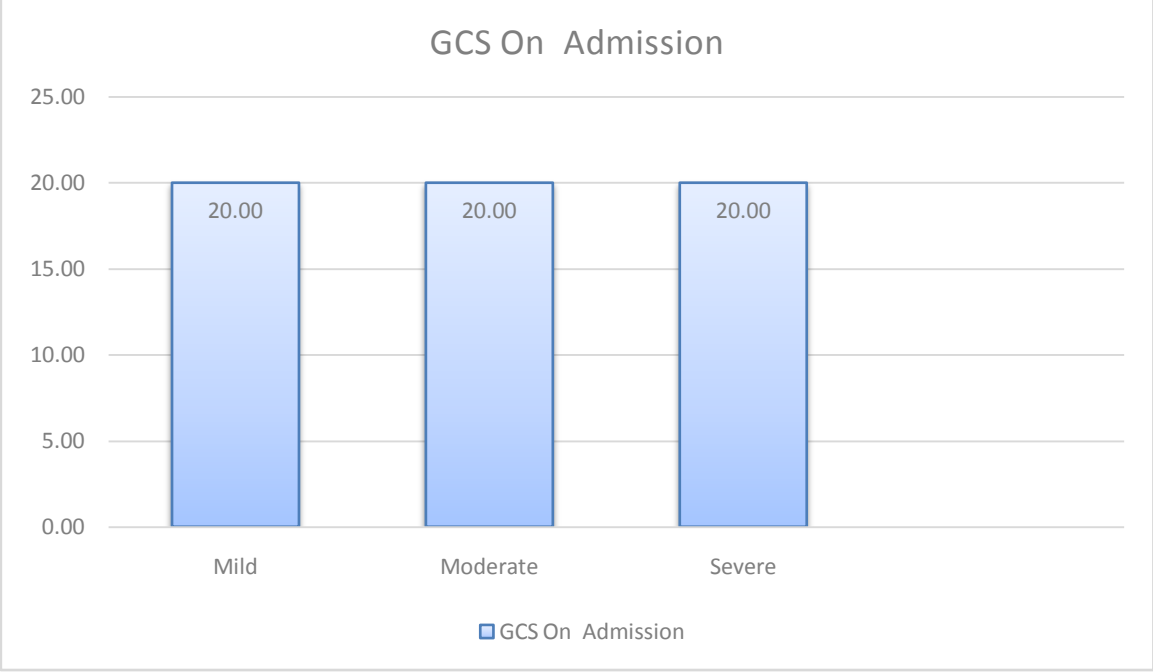
MATERIALS AND METHODS: An observational study was conducted in head injury patients who were admitted in the svims emergency department and later shifted to Neurosurgery department with mild, moderate and severe TBI this include 60 cases. There are numerous factors that can judge the outcome of head injury patients which includedage,gender, conscious level,cognitive level.

It is an observational study done on traumatic brain injury cases in our hospital in the neurosurgery department where we have gone through the patient's mode of fall or injury,their conscious level and their cognitive levels which were noted by using GCS scale and RLA scale respectively.

SOURCE OF DATA: Neurosurgery ward, SVIMS, Tirupati .

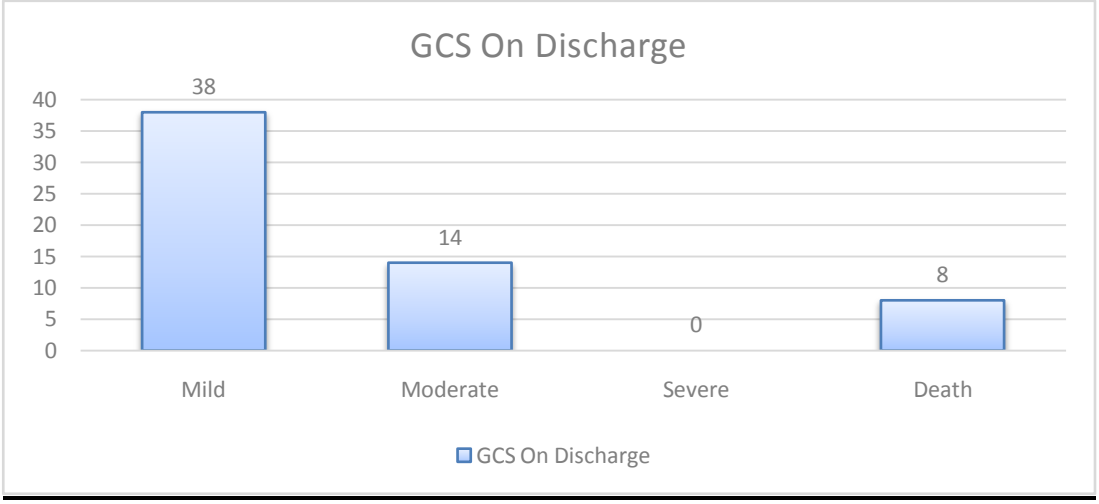
STUDY DESIGN: An observational study

SAMPLE SIZE:60
STUDY PERIOD:3 MONTHS
Cases taken for the studywere contusions, Skull fractures, SAH, SDH& EDH.
LEVEL OF CONSCIOUSNESS AND GLASGOW COMA OUTCOME SCORE
Age and Glasgow coma scale score on admission were considered as an important predictors of outcome after TBI.[8]
The Glasgow coma scale[GCS] is a gold standard instrument used to document level of consciousness in acute brain injury.Three areas of function are examined:Eyeopening,best motor response and verbal response.The total GCS score range from a low of 3 to a high of 15.GCS has traditionally been used to classify TBI as mild[GCS 13-15] Moderate[GCS 9-12], OR Severe [GCS 3-8][91]Severe brain injury frequently results in a period of altered consciousness characterised by impaired arousal and awareness .Disorders of consciousness(DOC) are characterised by alterations in arousal or awareness, common causes of DOC include cardiac arrest ,TBI and ischemic stroke[10].Frequent observation of neurological status within weeks and months is the best way for predicting outcome .However this would only indicate the probability of death ,or chance of survival and also the severity of disability ,as they have a low accuracy in determining the recovery ,partial disability or complete disability[11].Recovery of consciousness after severe brain injury involves reconstitution of brain arousal mechanism and cerebral integrative function[12.]
Percentage of TBI patients with GCS on admission
Mild- 20 (33.3%)
Moderate -20 (33.3%)
Severe -20(33.3%)



Glasgow coma scale on discharge
Mild- 38(63.3%)
Moderate- 14(23.3%)
Severe- 0(0)

Death -8(13.3%)



Traumatic brain injury is a leading cause of disability, creating a huge burden on individuals and society. It is often assumed that cognitive impairment will have strong influence on overall functional outcome[13]. Cognitive impairments due to TBI are substantial source of morbidity for affected individuals ,their family members and society .Disturbances of attention ,memory, and executive functioning are the most common cognitive consequences of TBI at all levels of severity[14]

The cognitive sequelae of TBI are determined by a number of injury related variables including TBI severity ,complications ,concomitant injuries to other body regions and chronicity of injury .Patients characteristics such as age, pre injury neuro psychiatric status and genotype also play a role[15].

RANCHO LOS AMIGOS SCALE

The Rancho Los Amigos scale,or Levels of Cognitive Functioning (LOCF),is widely used in rehabilitation facilities to examine the return of the person with brain injury from coma (Level I,No response) to consciousness (Level VIII ,purposeful -appropriate)

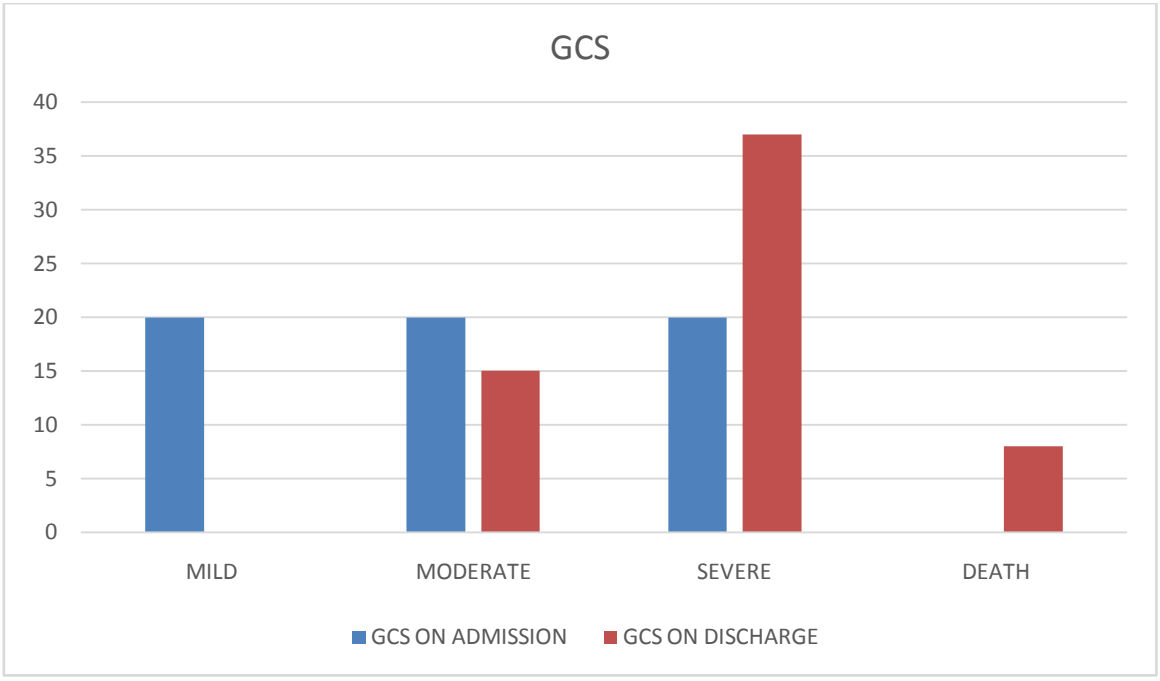
The Rancho Los Amigos scale is also known as the Ranchos Scale is a scale which is used to describe the cognitive and behavioural patterns in the brain injury patients as the recover from injury .It is often used in conjunction with Glasgow coma scale during initial assessment of a brain injury patient .But unlike GCS it can be used throughout the recovery period[16].

In our study we use the RLA scale on the admission and on discharge ,In this the score was given between I to VIII , The patient scored between I to IV (34), V to VIII(26) on admission , score between I to IV (6),V to VIII(46),Death (8) on discharge

OUTCOME

GCS ON OBSERVATION

INTERPRETATION	ON ADMISSION	ON DISCHARGE
SEVERE	20	0
MODERATE	20	15
MILD	20	37
DEATH	0	8



RLA OUTCOME

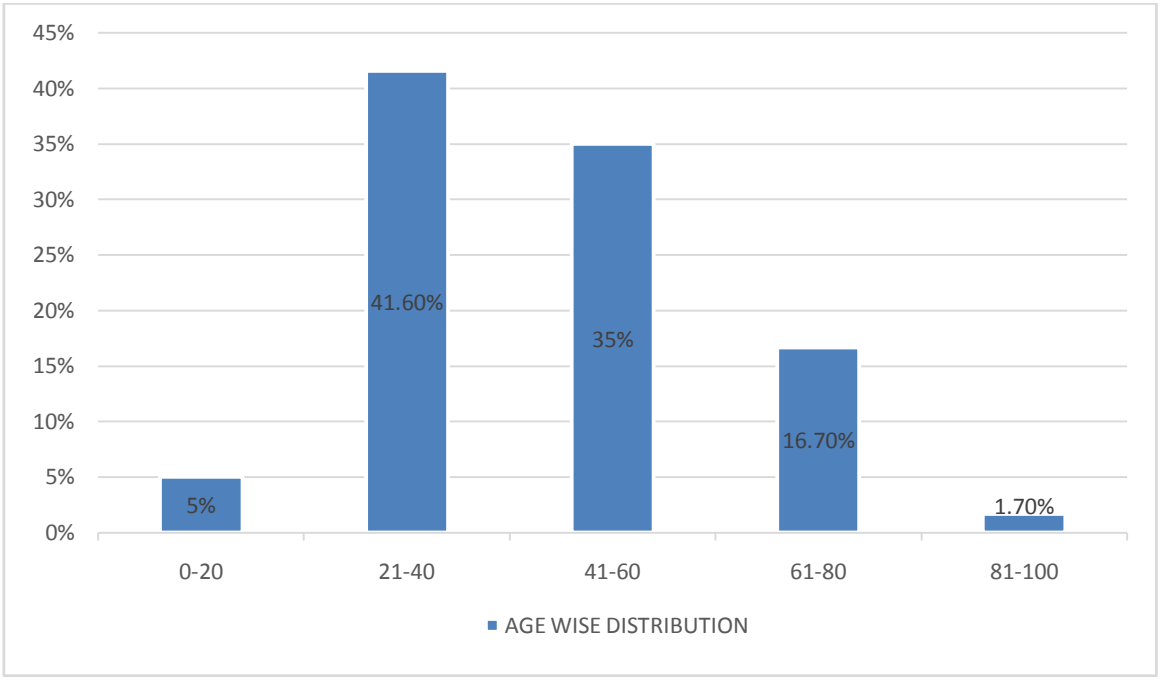
GRADES	ON ADMISSION	ON DISCHARGE
I	9	0
II	9	0
III	11	1
IV	5	5
V	7	5
VI	6	5
VII	12	18
VIII	1	18

RESULT:

Total number of patients with history of trauma admitted in neurosurgery department from March 2023 to June 2023. Number of patients included in the study Are 60.

Age wise distribution

Age	percentage
0-20	5%[3]
21-40	41.6%[25]
41-60	35%[21]
61-80	16.7%[10]
81-100	1.7%[01]



Overall the leading mechanism of traumatic brain injuries is road traffic accident. According to our study motor cycle has been the leading cause of RTA'S which resulted in head injuries.

Motor cycle- 47(78.3%)

Car-1(1.7%)

Lorry -1(1.7%)

Others-11(18.3%)

Here other causes include hit by rod,hit by bull,frequent falls in aged people.

The below pie chart shows the mode of fall of the patients included in the study.

Regarding CT findings

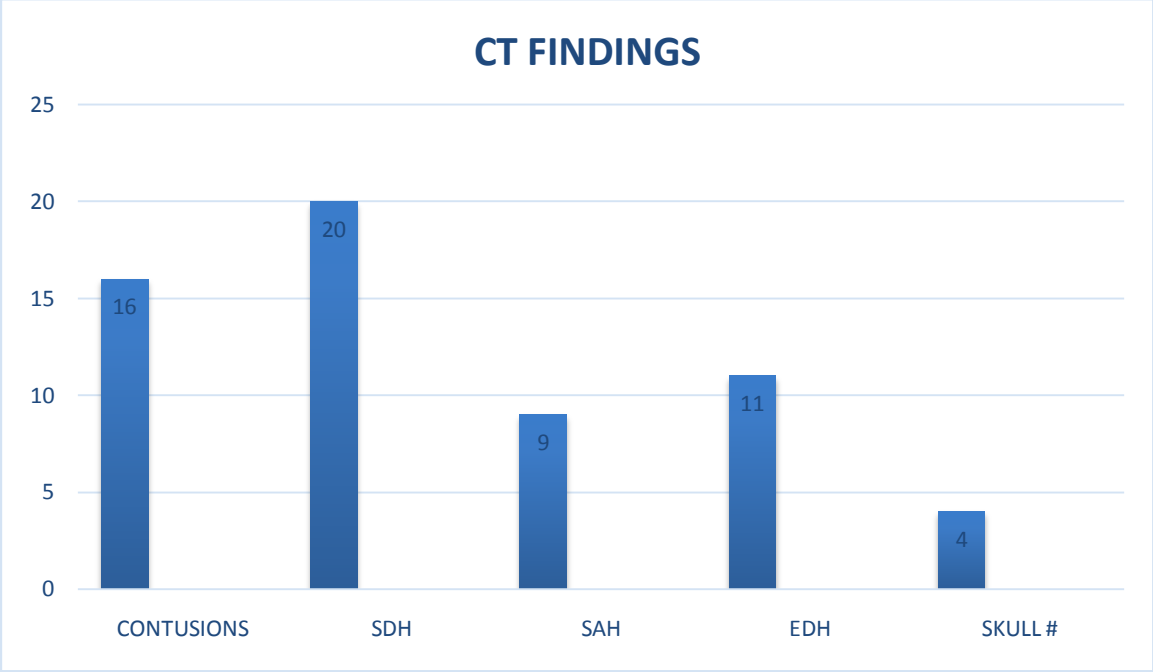
Contusions-16

Skull fractures-4

SDH -20

SAH-9

EDH-11



DISCUSSION

India being one of the developing nations in the world,with a high population density,the road traffic incidents are showing increasing trend.Till date TBI remains the leading cause of death and disability in young adults which contributes to significant traumatic mortality and morbidity[17].In studies carried out by Giacino and Trott and Kazanis it was concluded that GCS score in first 24 hours are crucial in predicting vital signs , and the results of performance could be predicted in the first 2 to 3 days of injury.In our study on 60 cases the leading mechanism of TBI are RTAs followed by assault,the leading cause for RTA was motor cycle accidents and these observations were similar to other studies[18,19] . Road accidents are the result of interaction between road users ,vehicles and the road environment .Despite an inability to follow commands at the time of inpatient rehabilitation admission,the majority of the sample achieved independence in daily functional activities across self care,mobility,and cognitive domains. In this study the consciousness levels of the patients were observed during their length of stay in the hospital, we have observed that most of the patients GCS outcome score was from moderate to mild .

In this study RLA Score was observed the score between I to IV (34) on admission was Changedfrom I to IV (6) on discharge , the score between V to VIII (26) on admission to V to VIII (46).

In this study the length of hospital stay of the patient from 1-4 days(14),5-8days (22),9-12 days(12),13-16days (4) .

In our study mortality was seen in 8 patients males(3),females(5).In this study the most common CT findings were SDH(20),Contusions(16),EDH(11) ,SAH(9),Skull fractures (4),contusions are the common findings in some studies[20,21].

CONCLUSION:

In our study the cause for TBI was motorcycle accidents, which was majorly seen in the age group between 20-40 and men were mainly affected. The GCS score waschanged from moderate to mild in majority of the patients.The RLA score improved from V-VIII from the date of admission to the date of discharge.

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