

**THE TAMILNADU DR.M.G.R MEDICAL UNIVERSITY
CHENNAI -600032.**



**A STUDY ON PAEDIATRIC HEAD INJURY PATIENTS
UNDER 12 YEARS**

Dissertation submitted in partial fulfillment by the
requirements for the degree of

**M.Ch BRANCH II NEUROSURGERY
EXAMINATIONS – AUGUST 2013**

**INSTITUTE OF NEUROLOGY
MADRAS MEDICAL COLLEGE & RAJIV GANDHI
GOVERNMENT GENERAL HOSPITAL
CHENNAI-600003.**

AUGUST -2013

CERTIFICATE

This is to certify that this dissertation entitled “**A Study on Paediatric Head Injury Patients under 12 years**” submitted by **Dr.M.A.Bose**, appearing for **M.Ch (Neurosurgery)** degree examination in August 2013 is a original bonafide record of work done from August 2010 to February 2013 by him under my guidance and supervision in partial fulfillment of requirement of the Tamil Nadu Dr.M.G.R. Medical University, Chennai. I forward this to the Tamil Nadu Dr.M.G.R. Medical University, Chennai, Tamil Nadu, India.

Prof.Dr.K.Deiveegan, M.S.,M.Ch
Professor of Neurosurgery and Head,
Institute of Neurology,
Madras Medical College &
Rajiv Gandhi Govt. General Hospital,
Chennai - 600 003.

Prof. Dr. V. Kanagasabai, M.D. Ph.D.,
The DEAN
Madras Medical College &
Rajiv Gandhi Govt. General Hospital,
Chennai - 600 003.

DECLARATION

I, Dr. M.A. Bose, solemnly declare that this dissertation “**A Study on Paediatric Head Injury Patients under 12 years**” was done by me at the Institute of Neurology, Madras Medical College and Rajiv Gandhi Government General Hospital, Chennai under the guidance and supervision of the Professor of Neurosurgery, Institute of Neurology, Madras Medical College and Rajiv Gandhi Government General Hospital, Chennai-3, between 2010 and 2013.

This dissertation is submitted to the Tamil Nadu Dr.M.G.R. Medical University, Chennai-600032 in partial fulfilment of the University requirements for the award of the degree of M.Ch., Neurosurgery.

Place : Chennai

Date :

(M.A. Bose)

ACKNOWLEDGEMENT

I owe my thanks to **THE DEAN**, Madras Medical College, Chennai, for permitting me to utilize the facilities and conducting this study and the members of Ethical Committee for their role.

I am extremely grateful to **Prof. K.DEIVEEGAN, M.S., M.Ch.**, Professor of Neurosurgery and Head of the Department, Institute of Neurology, Madras Medical College and Rajiv Gandhi Government General Hospital, Chennai, for his constant encouragement and guidance throughout the study and periodic reviews.

I sincerely thank all the Professors of our department **Prof. K.MAHESHWAR, Prof. S.D.SUBBIAH, Prof. RANGANATHAN JOTHI, Prof. G.S.JAGAN NARAYANA, Prof. S.SYAMALA** and our former Professors **Prof. R.ARUNKUMAR, Prof. V.G.RAMESH, Prof. C.SEKAR, Prof. V.SUNDAR, Prof. S.SUNDARAM, Prof. J.V.MAHENDRAN** for helping me with their time and advice during this study.

I am indebted to all my assistant professors for their support, guidance and help without which it would have been difficult to carry out this study. I wish to thank the Professors, Assistant Professors, Post Graduates, Interns, Paramedics, Office Staff, Technicians and Workers of the department of Pathology and Radiology for their cooperation which enormously helped me in this study.

I thank my patients and their relatives for participating in this study.

CONTENTS

S.No.	Title	Page No.
1.	INTRODUCTION	1
2.	AIM OF STUDY	10
3.	REVIEW OF LITERATURE	11
4.	MATERIALS & METHODS	18
5.	RESULTS	20
6.	DISCUSSION	45
7.	CONCLUSION	61
8.	BIBLIOGRAPHY	62

INTRODUCTION

There is probably no area in medicine in which the adage that “Children are not Little Adults and Infants are not Little Children” has greater applicability than in Craniocerebral trauma. Paediatric Head injuries contribute approximately 30% of total head injury cases. There are various mechanisms which contribute to injury in children and its prognosis which are different from others. The mechanism of injury, the response of the skull and the cranial contents to injury and the long term prognosis are quite different in the paediatric age group than compared with adults. Therefore paediatric head injury contributes a separate entity for the treating Neurosurgeons.

Paediatric population can also be sub grouped as;

1. Infants below 1 year
2. Toddlers – 1-5 years
3. Older children – More than 5 years

The 3 groups differ from each other in the mode of injury, susceptibility to skull fractures, brain swelling, ischemic brain damage, tolerance to hypoxia and blood loss in the prognosis.

Causes of Head Injuries

In comparison to adults the common mode of injuries in paediatric population are birth injuries and fall.

Mode of Head Injury

The commonest mode of head injury in neonate is due to birth trauma. In children up to 5 years of age head injuries are commonly due to accidental fall. In older children motor vehicle accidents contribute to significant number.

The resulting insult in Paediatric head injury includes from the Scalp to the Cranial vault and the brain parenchyma inside. In neonates “Caput succedaneum” which means scalp hematoma is due to cephalo pelvic disproportion and occurs during obstructed labour.

“Cephal haematoma” which is sub galeal hematoma is common in new borns following head injury.

Fractures are less common in Paediatric age group compared to adults because of elastic nature of the skull bone and the yielding nature of the skull bones compared to adult bones which are quite rigid can result in ping-pong fracture which is indentation without fracture is also specific to

children. Linear skull fractures with dural tear may result in growing skull fracture in some children.

Dura is usually tightly adherent to inner table and chance of developing EDH is rare in children less than 5 years.

Pathogenesis of brain injury

In adult brain oedema is usually due to breaking of blood brain barrier noted as vasogenic oedema. But in children it is due to significant venous congestion due to disturbed auto regulation due to release of excitatory neurotransmitter during injuries.

After sever traumatic brain injury reduction in cerebral blood flow (CBF) begins almost immediately after injury lasting as long as 24 hours. This happens due to neuro-chemically mediated vasospasm, astrocyte swelling with compression of the microcirculation. This early hypoperfusion with normal metabolic requirement is a high risk setting and any associated hypotension or hypoxia leads to further hypoxic ischemic injury to the brain. As the injury evolves, blood brain barrier disruption occurs, vasogenic edema occurs. In addition cytotoxic edema is a key factor to secondary cerebral swelling. Enlarging hematoma also contributes to decreased cerebral perfusion pressure (CPP) by increasing the

intracranial volume and intracranial pressure (ICP) and decreasing cerebral blood flow. Loss of cerebral auto regulation occurs frequently. Normal cerebral blood flow regulation in response to changes in blood pressure and cerebral vascular tone is absent.

Investigations

There are no concrete guidelines to suggest which patient need a CT brain to evaluate in trauma.

In generally practiced guidelines, a child with altered sensorium, history of local tenderness, vomiting, irritability are significant. Scalp haematoma, history of nasal / ear bleed. In case where CT scan was not available X-Ray skull, may be taken to rule out fractures.

CT Brain being fast to take and easy to identify haematomas is the preferred choice of investigation.

MRI Brain taking long time, noise associated and needs child's sedation which does not make it investigation of choice.

Treatment

Early management of air way, hypoxia, helps to avoid mortality. The protocol focused in an adult are also used in child deciding for surgery.

As in adult, management of brain oedema, mannitol is advised but hypertonic saline may also be used. Anti convulsants should be given if necessary care to avoid epilepsy.

Predictions for Mortality

Early low GCS Scale

Early post traumatic cranial nerve palsy, bulging fontanelle.

Hypovolemia at presentation

Age less than 1 year

All these features indicate severity of TBI and are significant contribution to mortality.

Clinical evaluation and management in emergency

In any child with multiple trauma, a quick primary and secondary survey is performed with prompt attention to airway, breathing and circulation. Pediatric patient with head injury may be brought unconscious, posturing (decerebrate or decorticate), or actively convulsing. All patients should be presumed to be full stomach and oxygen therapy should be initiated. Comatose patients need to be intubated with rapid sequence intubation technique, with due attention to cervical spine stabilization. Jaw thrust

maneuver can be performed during bag mask ventilation. Head tilt and chin lift maneuvers should be avoided. A cervical spine collar should be placed until cervical spine X-rays are obtained to rule out a fracture or dislocation.

Glasgow coma scale (GCS): For clinical evaluation, as much as possible, GCS for adults should not be used considering the anatomical, physiological and developmental differences of pediatric age group, a modified GCS is available.

Modified Glasgow Coma Scale

Pediatric Glasgow Coma Scale						
	1	2	3	4	5	6
Eyes	Does not open eyes	Opens eyes in response to painful stimuli	Opens eyes in response to speech	Opens eyes spontaneously	N/A	N/A
Verbal	No verbal response	Inconsolable, agitated	Inconsistently inconsolable, moaning	Cries but consolable, inappropriate interactions	Smiles, orients to sounds, follows objects, interacts	N/A
Motor	No motor response	Extension to pain (<u>decerebrate response</u>)	Abnormal flexion to pain for an infant (<u>decorticate response</u>)	Infant withdraws from pain	Infant withdraws from touch	Infant moves spontaneously or purposefully

Indices of good outcome 9-12

Single most reliable examination for evaluating outcome in children less than 3 years of age is ocular examination, as oculomotor functions are fully developed by two months of age, while cortico spinal myelination and optic pathway myelination develop much later. Child with open fontanel and ocular score of 3-4 generally has good outcome. Similarly children with motor score of 4 and closed fontanel will have good outcome. Those with closed fontanel and verbal score of 3 have good outcome.

Indices of poor outcome

Evidence of retinal hemorrhage indicates poor outcome.

Radiographic evidence of post-traumatic splitting of suture indicates poor outcome and high incidence of seizures. A bilateral linear skull fracture correlates with poor outcome. Incidence of post-traumatic seizure is 10%

Complication and sequelae of head injury

Early

Transient cortical blindness

Seizures

Cranial Nerve palsy

Diabetes insipidus

Syndrome of inappropriate secretion of ADH Cortical venous
occlusion

Hemiparesis

Late

Post traumatic epilepsy Post traumatic aneurysm

Meningitis Hydrocephalus Memory loss Disability

Muscle contractures

Outcome after paediatric head injury

Child outcome score has been described based on various
parameters such as neurological and cognitive deficit.

Child outcome score

- I. Child Outcome Score Excellent recovery
- II. Moderate but non-disabling deficit
- III. Either a severe motor or cognitive deficit
- IV. Vegetative
- V. Death

I and II – Good outcome

III to V – Poor outcome

Indices of good outcome and poor outcome have already been described earlier.

AIM OF THE STUDY

To analyse the incidence and the factors predicting the final outcome in paediatric head injury patients.

To analyse the symptoms, CT findings in paediatric head injury patients.

To analyse the mode of management in paediatric head injury patients.

REVIEW OF LITERATURE

Berney et al.,¹ in their study on children in the age group 0-3 years sustained low energy trauma suffered more skull fractures and SDH and early seizures compared to other ages of children between 3 and 9 years had more high energy trauma with brain swelling & EDH were observed. Children between 9 and 15 years more often found to have EDH when compared to SDH.

According to *Rivara et al.*,² in low fall like fall from table, bed etc., the common pathology encountered are concussion brain, fracture skull, ICH.

Toft et al.,³ have analysed outcome in traumatic brain injury of paediatric population in comparison with adult with respect to mode of injury and found that in infants the common cause of nonfatal Traumatic brain injury is fall (65%) and total traumatic brain injury is equally distributed between motor vehicle accidents and fall (40%).

Greenes and Shutz,⁴ have analysed head injury in children less than 2 years and found that they are often (19%) asymptomatic, alert and playful with occult intra cranial injuries. The CT Scan showed EDH / SDH.

According to *Durkin et al.*,⁵ RTA are the leading cause of severe head injuries in children. The common type of RTA in children are pedestrian injuries, bicycle injuries, motor vehicle injuries, these being common in their age groups 6-10, 9-15, 12-16 respectively.

According to *Myhre Mc et al.*,⁶ traumatic head injuries in infants and toddlers - EDH, isolated skull fracture are more common in accidental injuries.

Fundavo et al.,⁷ state that vomiting is the only significant symptom noted in infant with head injury, loss of consciousness in other age group children. The relation between swelling in the scalp CT abnormalities is statistically significant, hence LOC and scalp swelling and vomiting deserve CT scanning in children.

Homes et al.,⁸ have analysed, performance of paediatric Glasgow coma scale children with blunt head trauma. They have concluded as paediatric GCS is effective in assessing in head injury in children 2 years or younger (preverbal) and standard GCS is effective in old children.

Al Habib et al. from annals of medicine Jan 2013 states that injury to the head is the most commonly affected body parts in paediatric injuries and is associated with serious consequences.

According to *Durkin et al.*,⁵ death secondary to paediatric head injury represent a significant public health problem with cost burden directly on Government Agencies. Pedestrian injuries are common among 6-10 years old children and bicycle injury are common in 9-15 years old children of motor vehicle occupants injury were common from 12-16 years.

Fundavo et al.,⁷ vomiting is the only significant symptom noted in infant with head injury, LOC in other children group. The relation between, swelling in the scalp and CT abnormalities is statically significant. Hence, LOC and scalp swelling and vomiting reserve CT.

Homes et al.,⁸ performance of paediatric Glasgow coma scale in children with blunt head trauma. Paediatric GCS is effective in assessing head injury in children 2 years or younger (Pre verbal) and standard GC, is effective in older children.

Wang et al.,⁹ in a population based multi-center, prospective study of pediatric trauma patients with mild alterations in consciousness (GCS 13-14), reported an incidence of 27.4% abnormal CT scans and 3.7% required surgical intervention in a selected group of patients and concluded that great majority of this patients will not require operative intervention, but the implications of missing these hemorrhages can be severe for this

sub group of head injured patients. Because clinical criteria and cranial X-rays are poor predictors of intracranial hemorrhage, it was recommended that all children with a GCS score as 13 and 14 routinely undergo screening via computer tomography.

Scalea et al.,¹⁰ in their retrospective study of selected pediatric population noted an incidence of 14% as positive CT scan and 0.70% of the study group underwent surgical intervention and concluded that a normal neurologic exam and maintenance of consciousness does not preclude significant rates of intracranial injury in pediatric trauma patients. Contrary to convention, neither LOC nor mild altered mentation was a sensitive indicator to select patients for CT scanning. Skull fractures and superficial craniofacial injuries were similarly unreliable. Identification of these patients was important for the occasional case requiring intervention and for the tracking of complications. A liberal policy of CT scanning was warranted for pediatric patients with a high-risk mechanism of injury despite maintenance of normal neurologic status in the field and at hospital screening.

*Schutzman*¹¹ proposed various guidelines for evaluation and management of children younger than 2 years old with apparently minor head trauma but concluded that the effect of the proposed guidelines on

clinical outcomes and resource utilization should be evaluated.

Schunk et al.,¹² in their retrospective analysis of the utility of head computed tomographic scanning in pediatric patients with normal neurologic examination in the emergency department, reported an incidence <5% and need for neurosurgical intervention in 1% of the cases and concluded that commonly used clinical variables viz., sleepiness, vomiting, headache, LOC, irritability, amnesia and seizures, were not associated with intracranial injuries in these children.

Aitken et al.,¹³ in their survey of current management practices of pediatricians, emergency physicians and family physicians of minor pediatric head trauma concluded that most physicians chose clinic or home observation for initial management, and clinical management was more varied when patients had sustained either loss of consciousness or seizures and suggested further study of the appropriate management of head trauma in children needed to guide physicians in their case.

Rattan et al.,¹⁴ in their prospective, selective study of pediatric head injured patients, concluded that while a significant association was found between the duration of consciousness and GCS, but no significant association of either of these variable with CT scan findings was noted.

*Murshid*¹⁵ in his retrospective review of selective cases concluded that the indications for CT scan were, an abnormal GCS, presence of neurological deficit, signs of suspicion of basal or depressed fracture and persistent or progressive head ache or vomiting and recommended that infants with minor head injuries should be followed up atleast once after 2-3 months for possible growing fractures.

Moran et al.,¹⁶ reported an incidence of 8.3% positive scan in their prospective, selective population and concluded that LOC and skull fracture are independent predictors of positive cerebral CT scans and recommended immediate CT scan in all minor head injury patients with LOC or a suspected skull fracture, to optimize the outcome of those needing surgical intervention and those patients without LOC and GCS score of 13-15 do not require CT scanning unless otherwise clinically indicated.

Inamasu et al.,¹⁷ in their retrospective study, reported an incidence of 0.5% deterioration of mild head injured patients and concluded that, although routine use of CT scans in patients with mild head injury has been controversial, CT scans should be taken if patients have experienced transient LOC to prevent or reduce the occurrence of deterioration in the emergency department.

Borzuck et al.,¹⁸ in his retrospective descriptive study reported an incidence of 8.2% of abnormal CT scan and 0.76% neurosurgical intervention and concluded that abnormalities on CT scans in patients with mild head trauma are fairly common, although the need for neurosurgical intervention was rare. Clinical decision rules can be used to identify these patients with more serious intracranial pathology and recommended such strategies should be validated prospectively in various emergency department settings. He also defined that, loss of consciousness (LOC) was a difficult variable to quantify because, qualified witness was usually not available. Instead, LOC was coded as questionable LOC, brief LOC of several seconds, or LOC of a minute or more.

Mikhail et al.,¹⁹ in their prospective study of 35 selected patients reported, 22.86% incidence of intracranial injury and 8.57% required surgery. One patient died following surgery and concluded that intracranial injury does exist in patients suffering from minor head trauma with a GCS score of 13 or above and further, age over 4 years and complaint of headache were associated with an increased risk of intracranial injury.

Stein et al.,²⁰ in their retrospective study reported an incidence of 18.4% intracranial lesions and 5.5% requirement of surgery and recommended that any patient, who had suffered a loss of consciousness or amnesia needs CT examination.

MATERIALS AND METHODS

HOSPITAL SETUP

This study was conducted at RAJIV GANDHI GOVERNMENT GENERAL HOSPITAL, Chennai, Tamil Nadu, and our neurosurgical department MADRAS INSTITUTE OF NEUROLOGY is one of the pioneers in the establishment of neurosurgical centers in our nation.

Our government general hospital is a tertiary care referral centre where all the trauma cases including the pediatric head injury cases are admitted by the casualty medical officers. Duty neurosurgery assistants and post graduates are present round the clock in trauma ward who gives 24 hour trauma care to all the pediatric head injury cases.

All the pediatric head injury patients are initially examined by ABCD method and their vitals are monitored after making sure that the child is hemodynamically stable, the child is shifted for CT scanning the child is accompanied by the resident doctor.

STUDY PATTERN

Consecutive 150 patients admitted to NeuroSurgery TRAUMA ward with head injuries during the period of August 2011 – July 2012 were studied prospectively.

All the paediatric patients were included in the study group and there is no specific exclusion criteria.

Patients clinical profile such as age, sex, admission GCS, preliminary signs and symptoms are recorded.

CT Scan Brain, and its findings were noted and analyzed in detail.

Patients were managed either conservatively or surgically based on clinical and radiological findings.

Outcome at the time of discharge were noted. Patients were followed a period of varying from 3 months to one year.

The above data were entered in the Master Chart and varying factors contributing the severity of head injury in paediatric age groups and various parameters contributing to the outcome were analysed.

RESULTS

TOTAL PATIENTS

PATIENTS ADMITTED

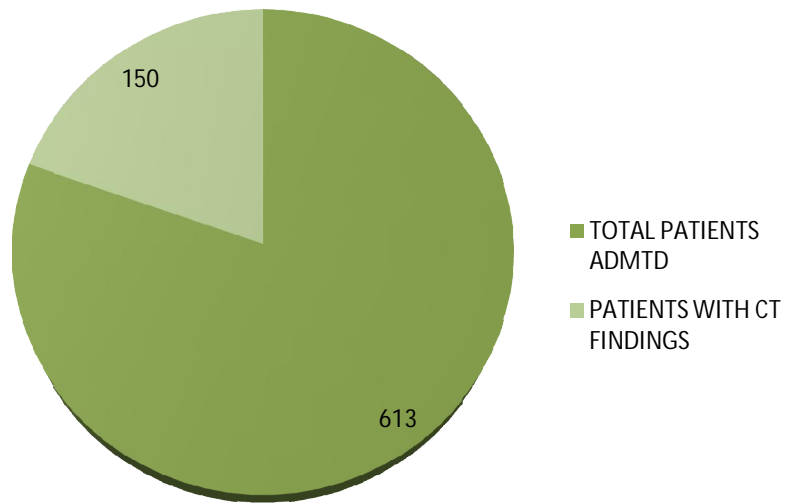


CHART 1

SEX DISTRIBUTION

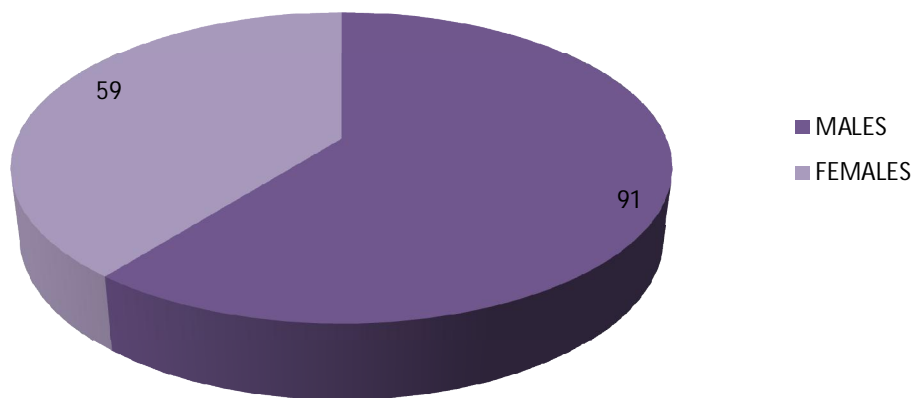


CHART 2

AGE DISTRIBUTION

Group	Age	Frequency	Percent	Valid Percent	Cumulative Percent
I	LESS THAN 1 YEAR	13	4.0	4.0	4.0
II	1 TO 5 YEAR	67	48.7	48.7	52.7
III	MORE THAN FIVE YEAR	70	47.3	47.3	100.0

TABLE 1

AGE GROUP

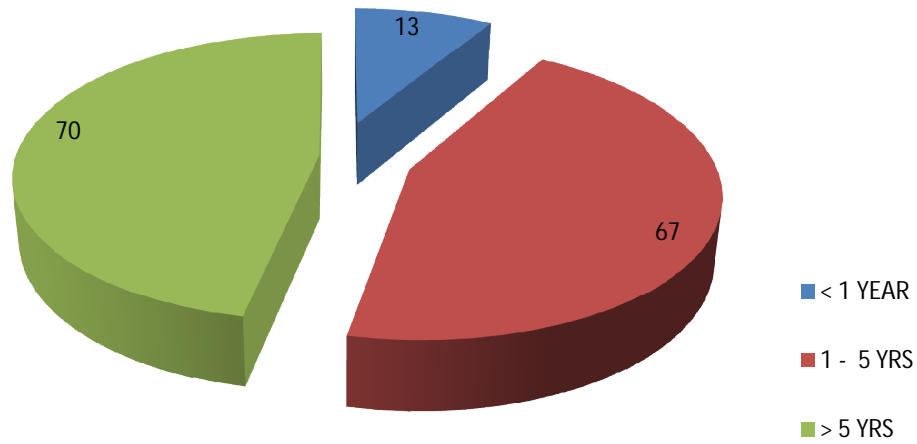


CHART 3

MODE OF INJURY

MODE OF INJURIES	Frequency	Percent
ASSAULT	1	0.7
FALL	79	32.7
RTA	67	43.3
TA	1	1.3
FALL OF HEAVY OBJECT	2	6.7
TOTAL	150	100%

TABLE 2

MODE OF INJURY

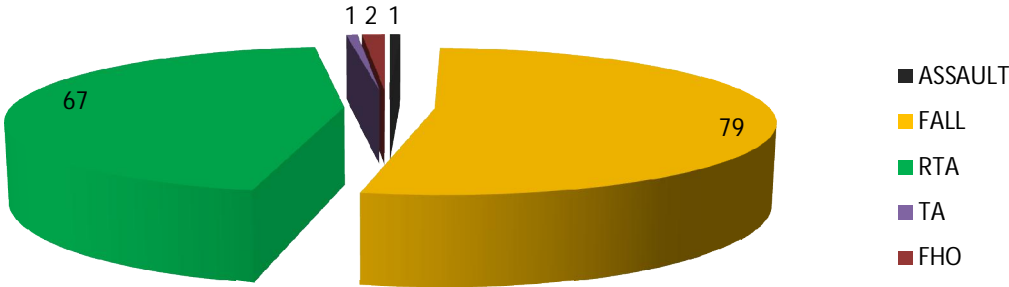


CHART 4

	Mode of Injuries					
	ASSAULT	FALL	FHO	RTA	TA	Total
GROUP I	0	9	0	4	0	13
GROUP II	0	33	2	32	0	67
GROUP III	1	37	0	31	1	70

TABLE 3

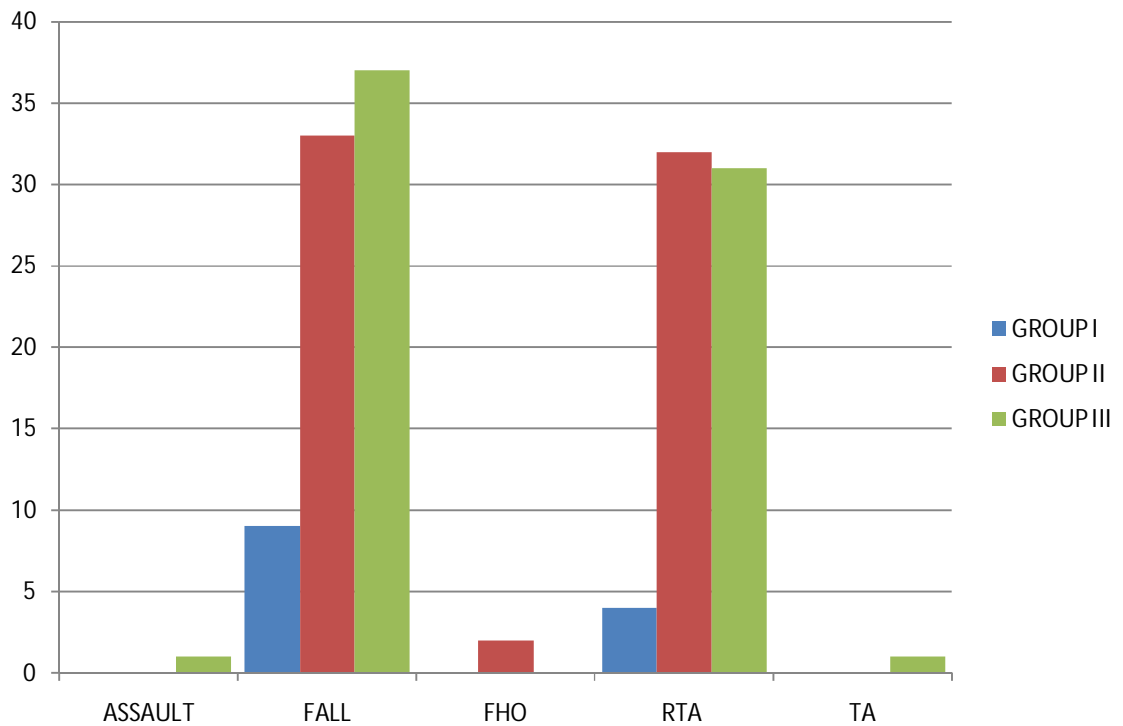


CHART 5

GCS

GCS	Frequency	Percent
3-8	7	4.6
9-12	15	10.0
13-15	128	84.4

TABLE 4

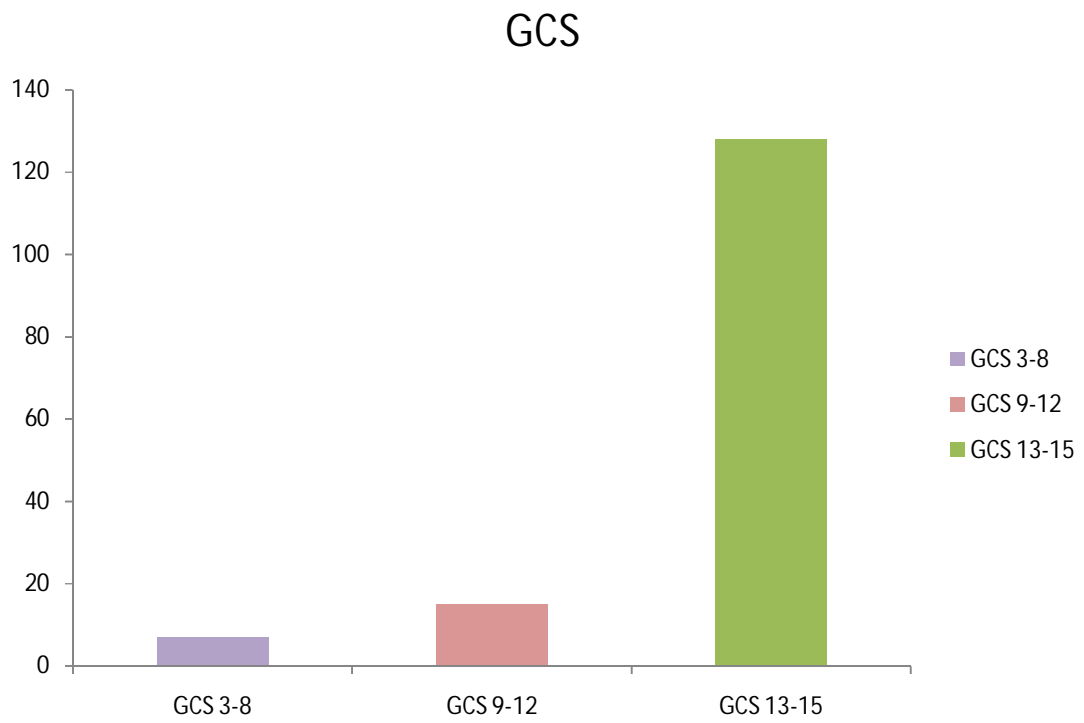


CHART 6

GCS

	3-8	9-12	13-15
GROUP I	0	0	13
GROUP II	2	7	57
GROUP III	5	8	58

TABLE 5

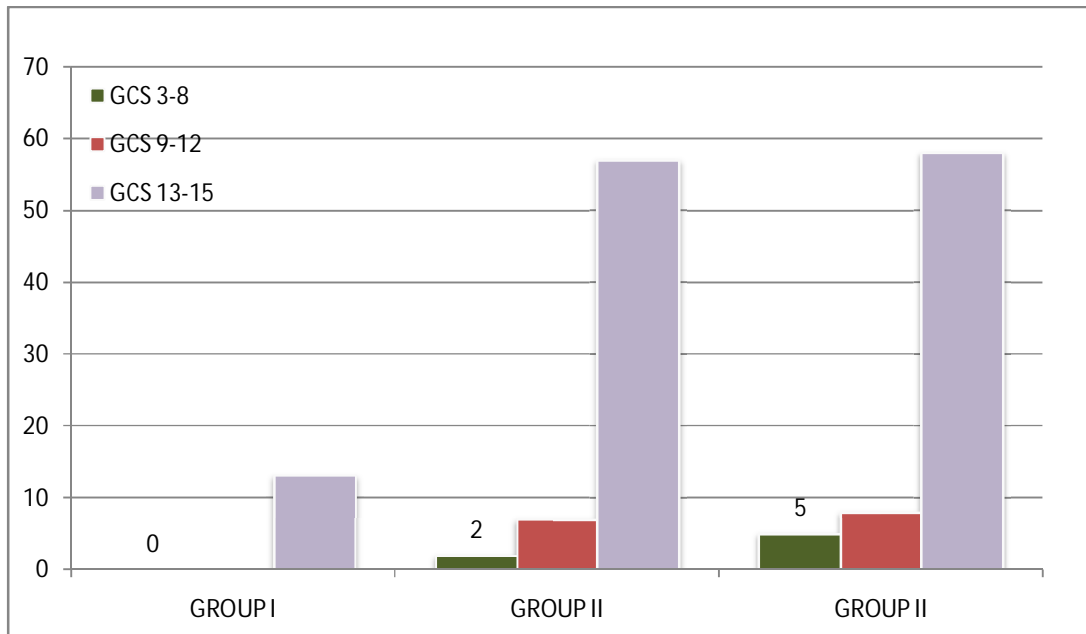


CHART 7

CT FINDINGS

	NUMBER	IMPROVED	DEATH
EDH	14	14	0
SDH	04	04	0
CONTUSION	14	14	0
DAI	2	2	0
FRACTURES	67	67	0
OTHERS	16	16	0
MULTIPLE	34	28	6

TABLE 6

CT Findings

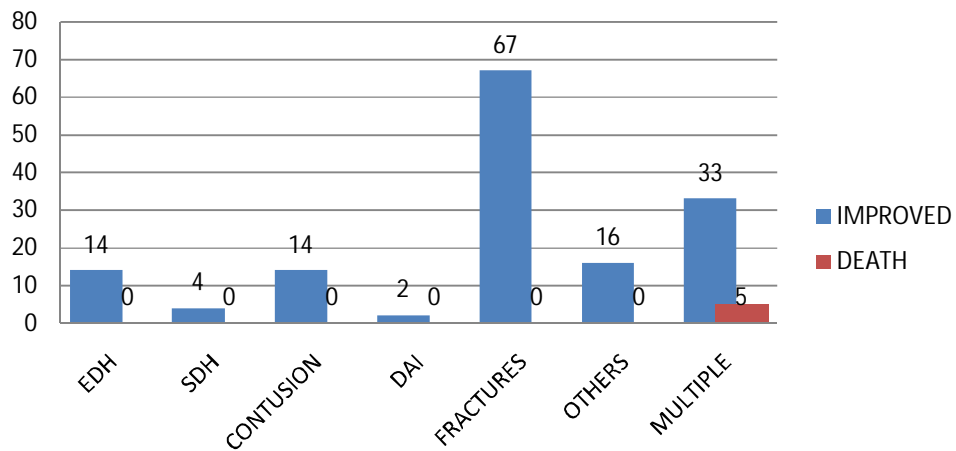


CHART 8

LOC

	LOC
GROUP I	6
GROUP II	35
GROUP III	42

TABLE 7

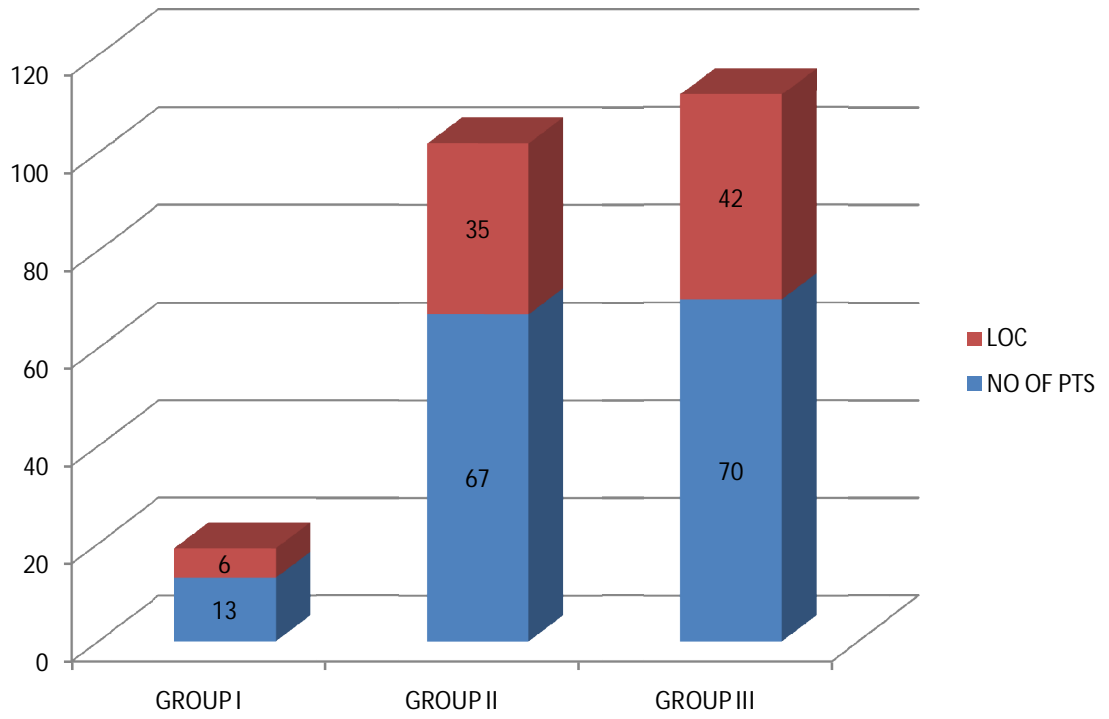


CHART 8

VOMITING

VOMITING	NO OF PTS
GROUP I	4
GROUP II	32
GROUP III	26

TABLE 8

VOMITING

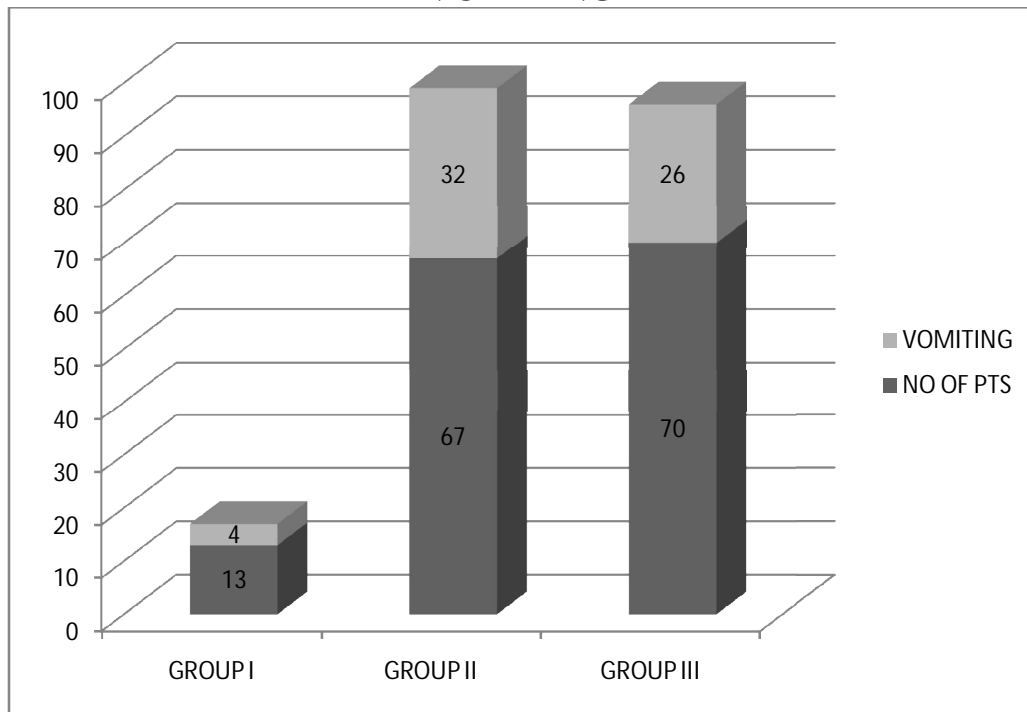


CHART 9

ENT BLEED

ENT BLEED	NO OF PTS
GROUP I	1
GROUP II	8
GROUP III	5

TABLE 9

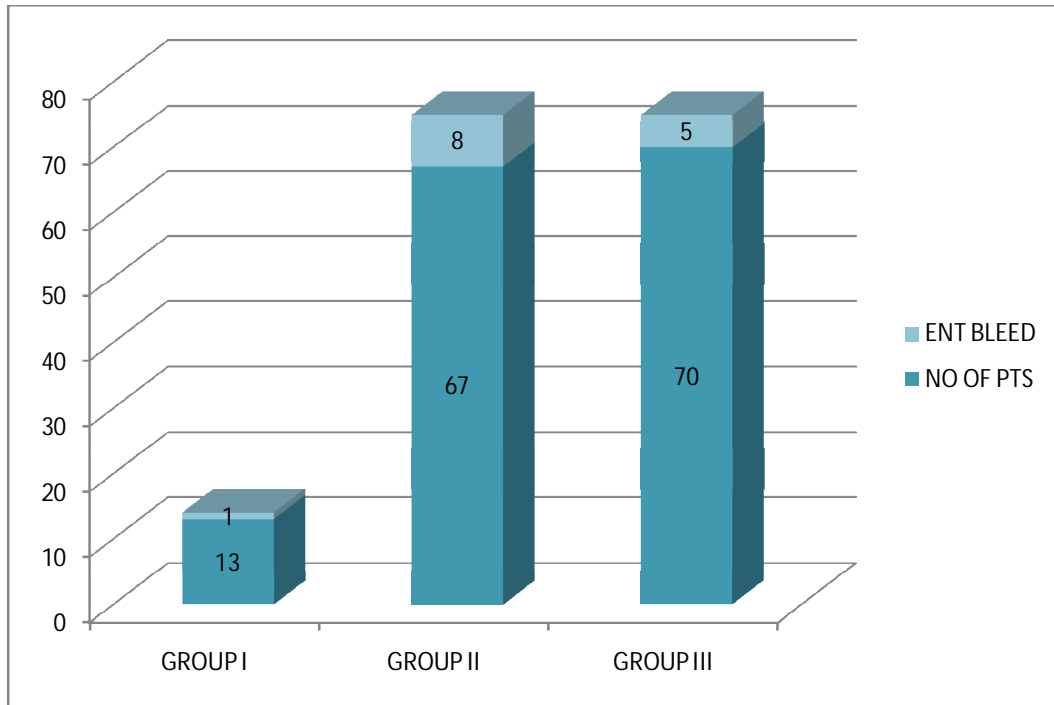


CHART 10

SEIZURES

SEIZURES	NO OF PTS
GROUP I	0
GROUP II	5
GROUP III	0

TABLE 10

SEIZURES

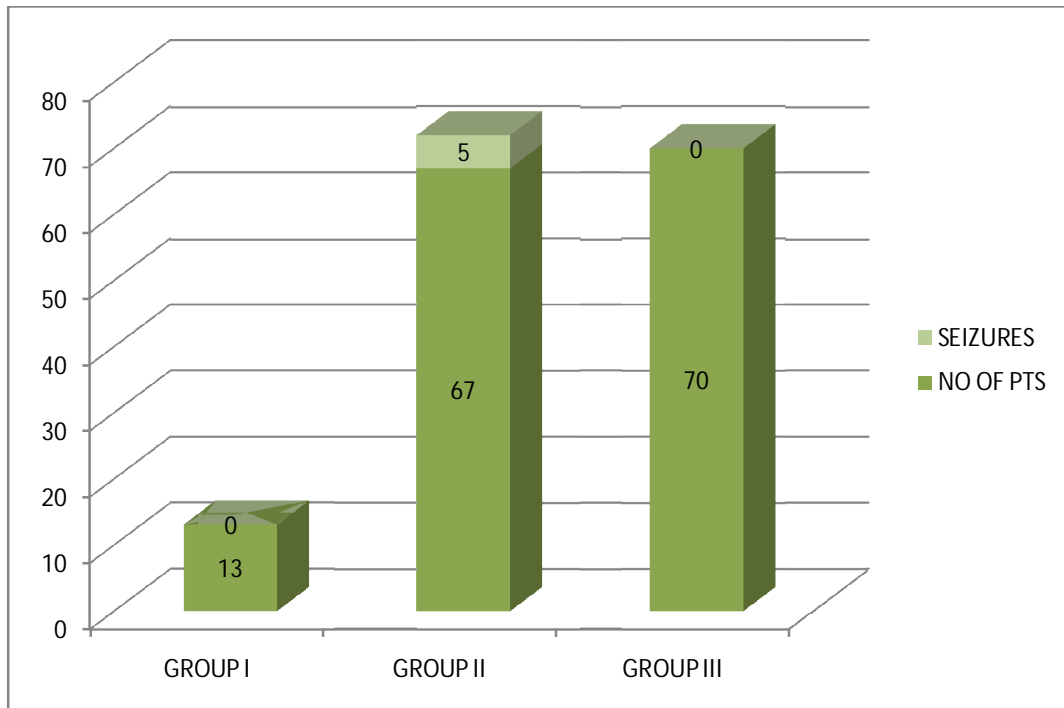


CHART 11

FRACTURES

FRACTURES	NO OF PTS
GROUP I	10
GROUP II	48
GROUP III	39

TABLE 11

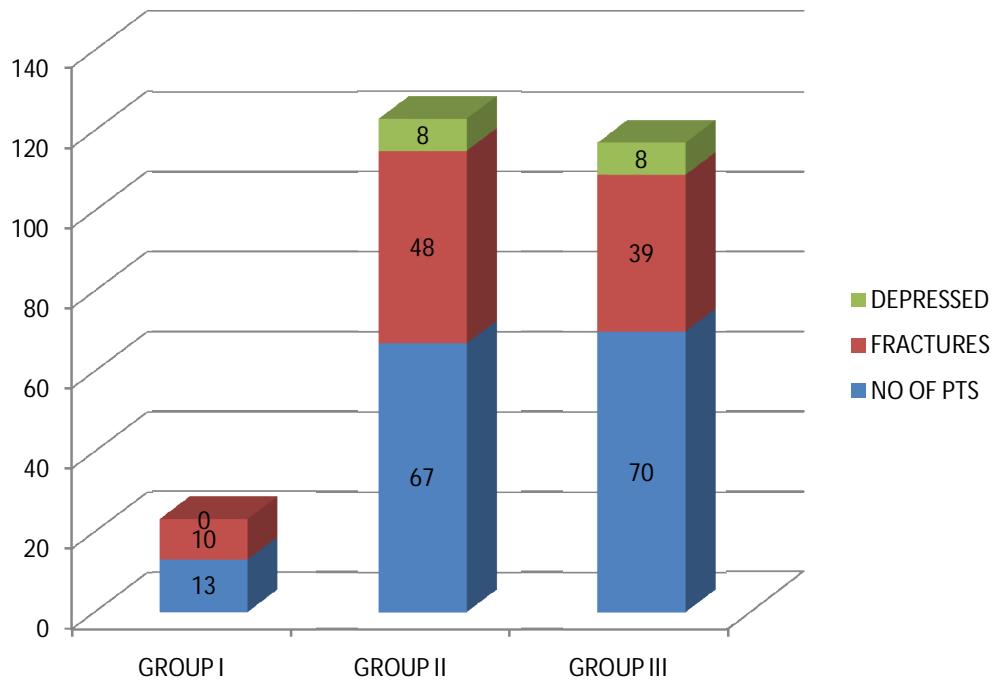


CHART 12

DEPRESSED FRACTURES

DEPRESSED FRACTURES	NO OF PTS
GROUP I	0
GROUP II	8
GROUP III	8

TABLE 12

PNEUMOCEPHALUS

PNEUMOCEPHALUS	NO OF PTS
GROUP I	0
GROUP II	8
GROUP III	8

TABLE 13

PNEUMOCEPHALUS

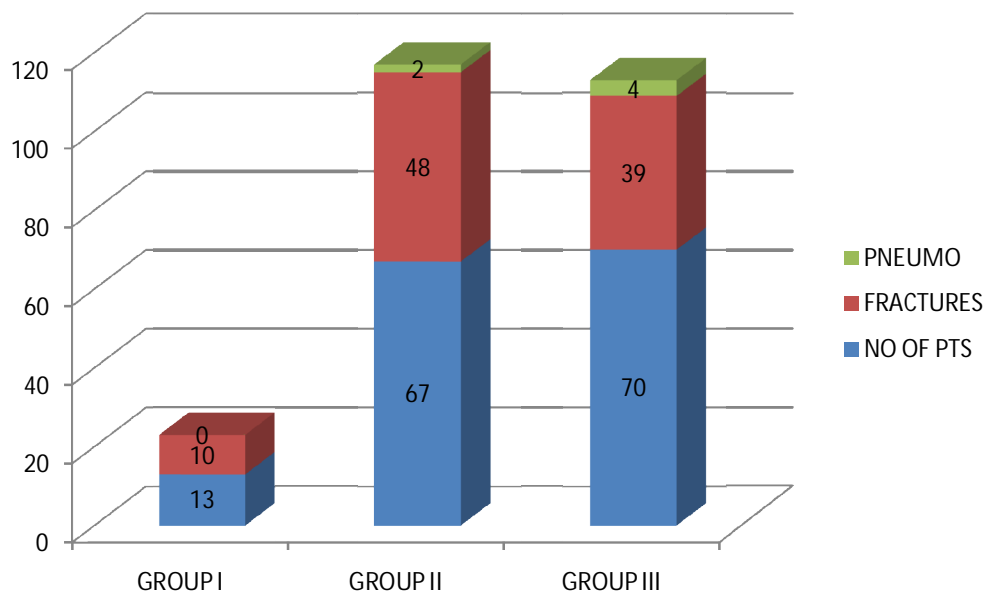


CHART 13

EDH

EDH	NO OF PTS
GROUP I	4
GROUP II	10
GROUP III	15

TABLE 14

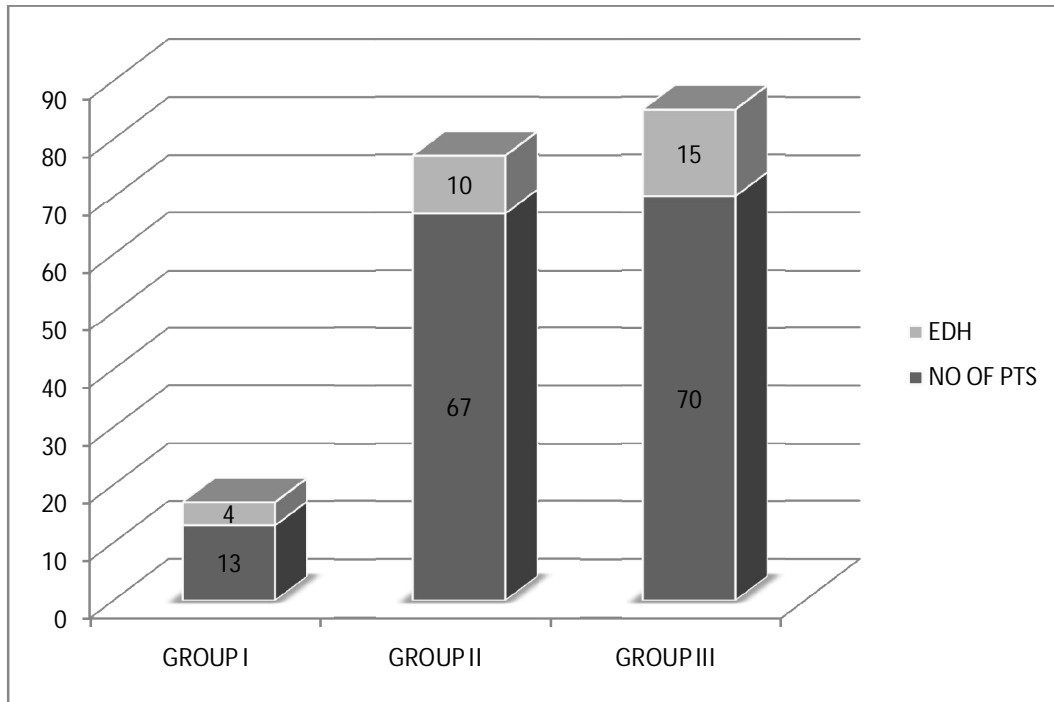


CHART 14

SDH

SDH	NO OF PTS
GROUP I	1
GROUP II	0
GROUP III	3

TABLE 15

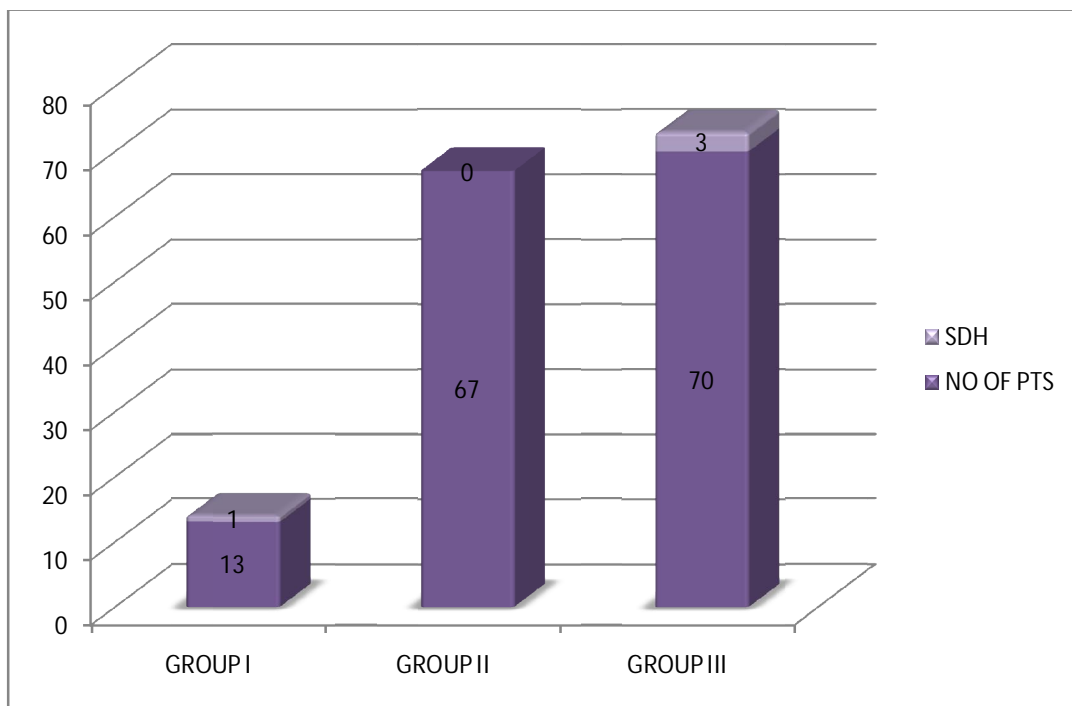


CHART 15

CONTUSION

CONTUSION	NO OF PTS
GROUP I	2
GROUP II	9
GROUP III	17

TABLE 16

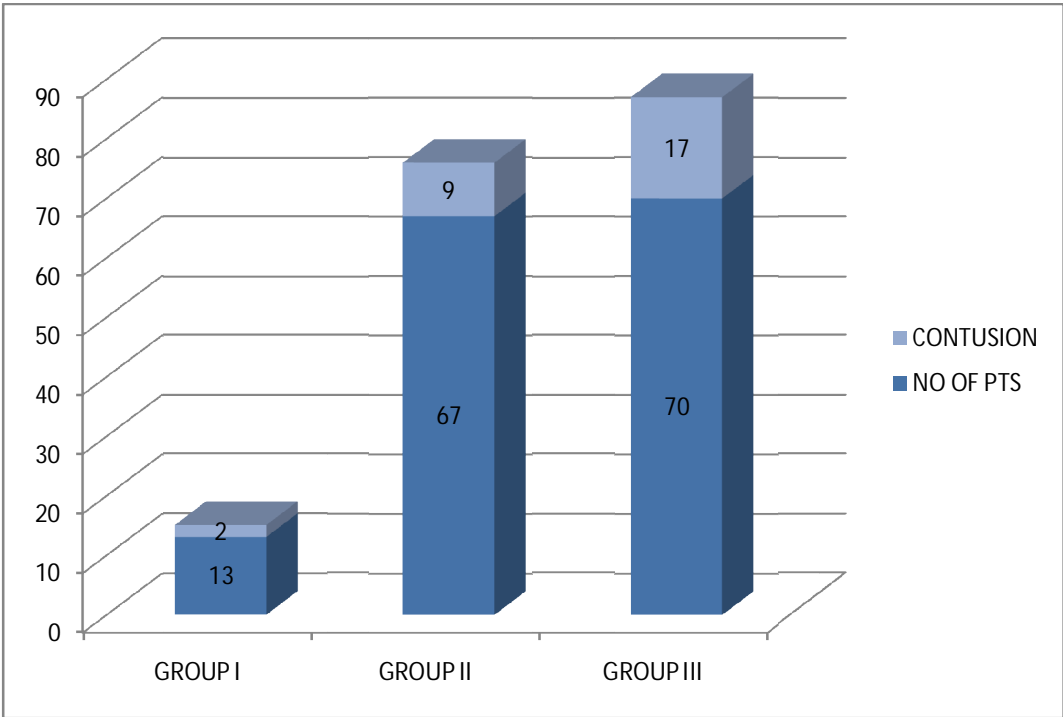


CHART 16

DAI

DAI	NO OF PTS
GROUP I	0
GROUP II	4
GROUP III	2

TABLE 17

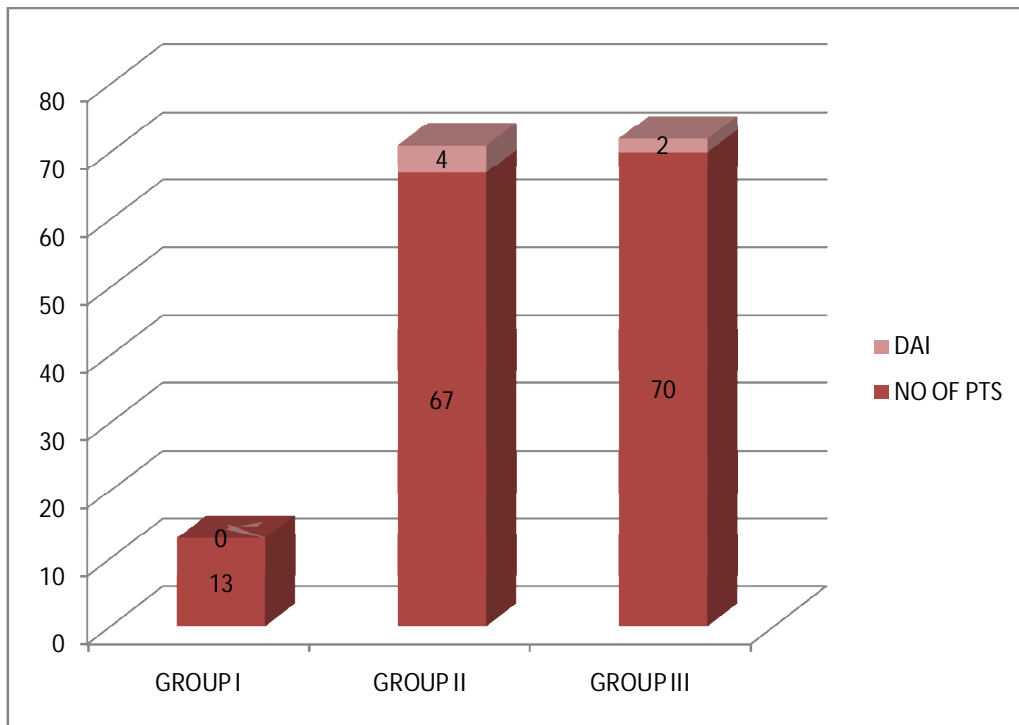


CHART 17

SURGICAL MANAGEMENT

SURGICAL MGMT	NO OF PTS
GROUP I	1
GROUP II	10
GROUP III	7

TABLE 18

SURGICAL MANAGEMENT

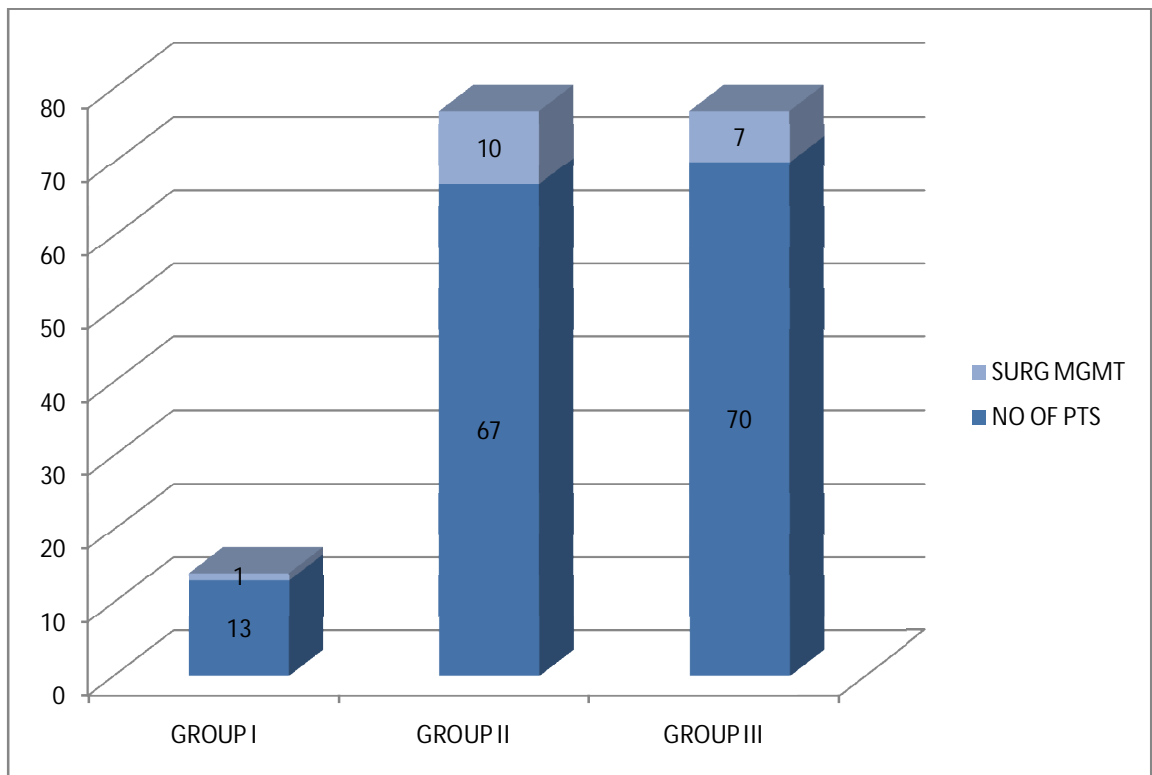


CHART 18

CRANIAL NERVE INJURY

SURGICAL MGMT	NO OF PTS
GROUP I	2
GROUP II	8
GROUP III	11

TABLE 19

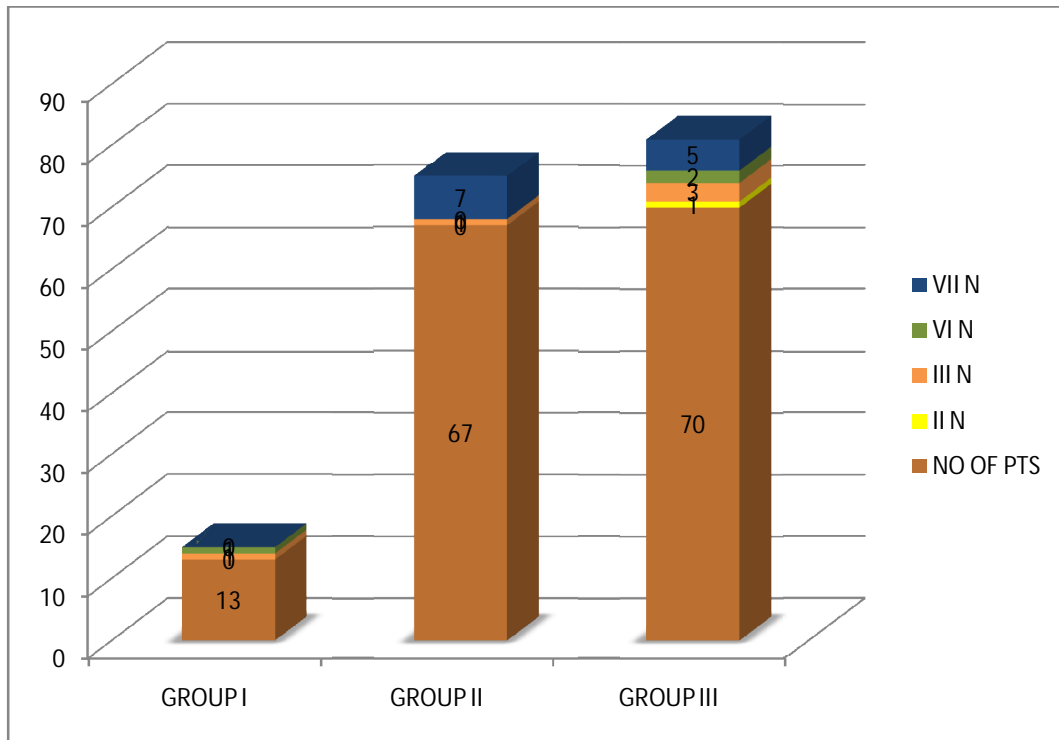


CHART 19

GOS

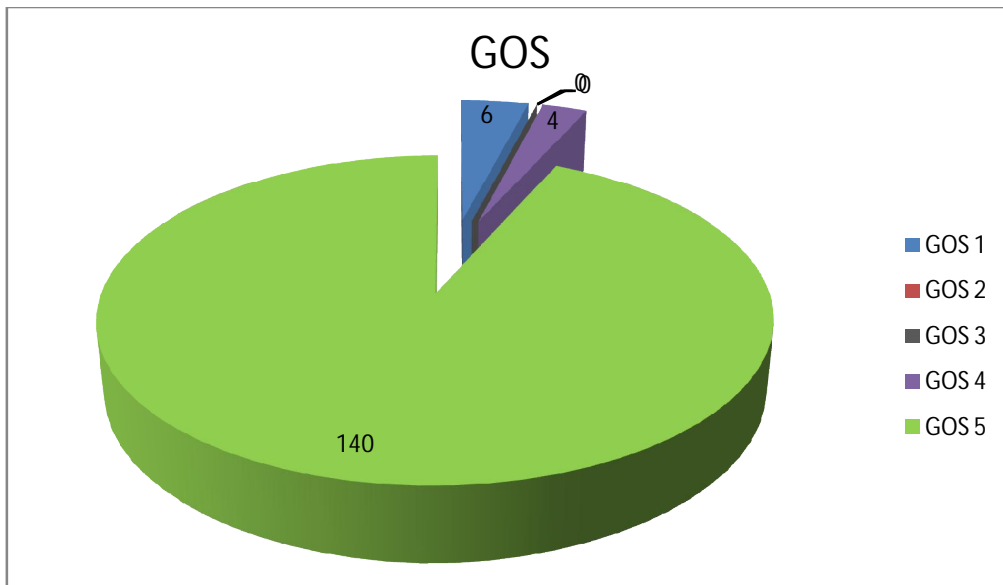


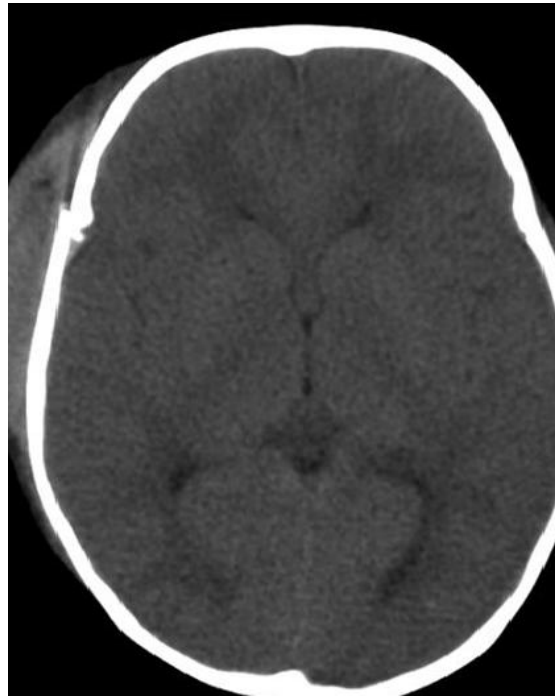
CHART 20

DEATH

DEATH	NO OF PTS
GROUP I	0
GROUP II	1
GROUP III	5

TABLE 20

CT SCAN SHOWING DEPRESSED FRACTURE



POST OP PICTURE OF A DEPRESSED FRACTURE



CT SCAN SHOWING DEPRESSED FRACTURE AND PNEUMOCEPHALUS



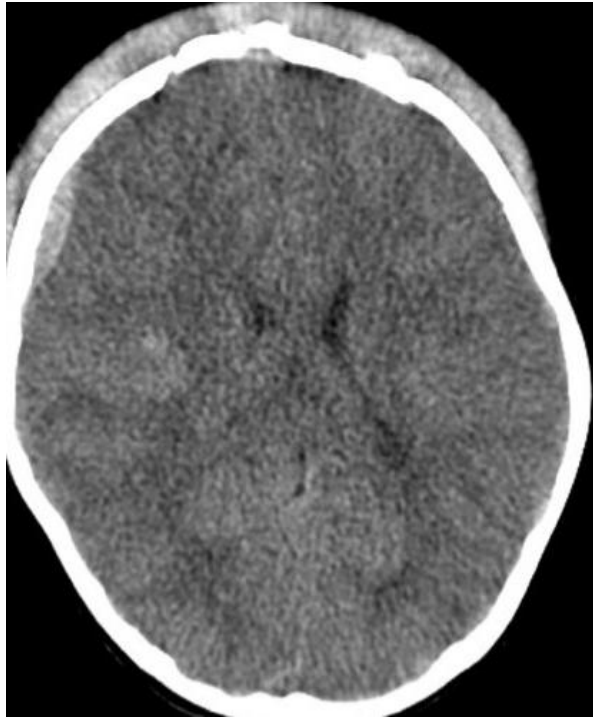
CT SCAN SHOWING RT PARIETAL EDH



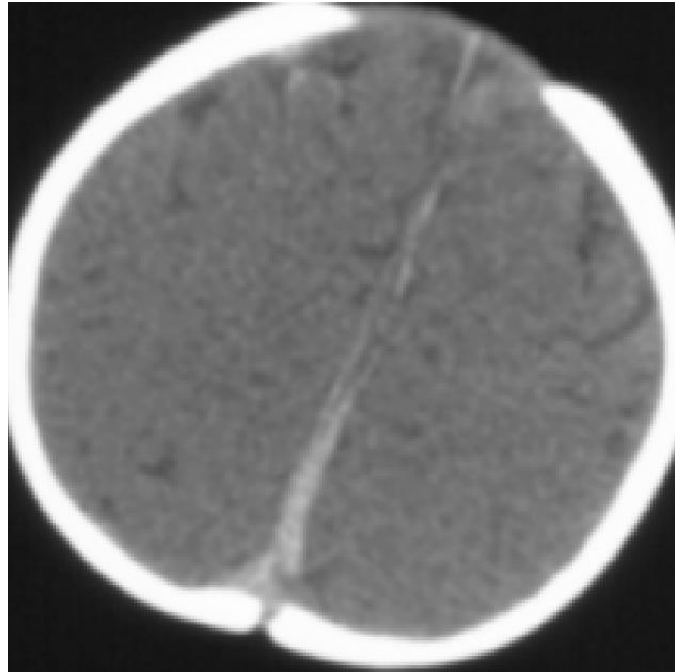
CT SCAN SHOWING LT PARIETOOCCIPITAL EDH



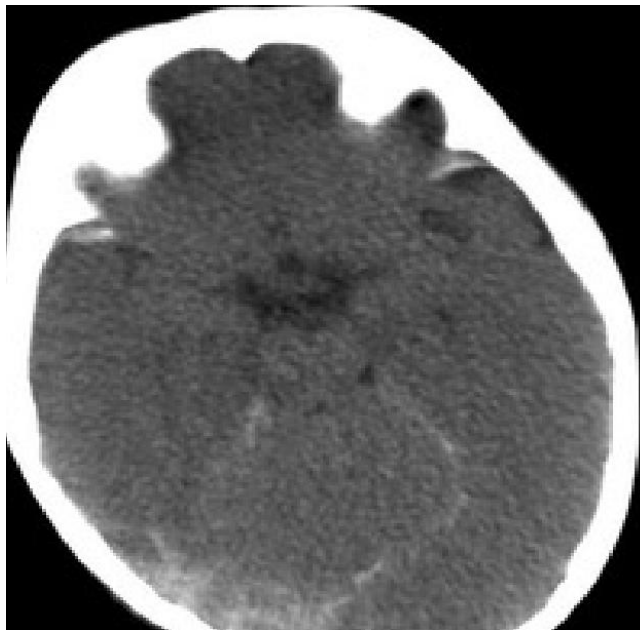
CT SCAN SHOWING RT PARIETAL EDH



CT SCAN SHOWING INTERHEMISPHERIC BLEED



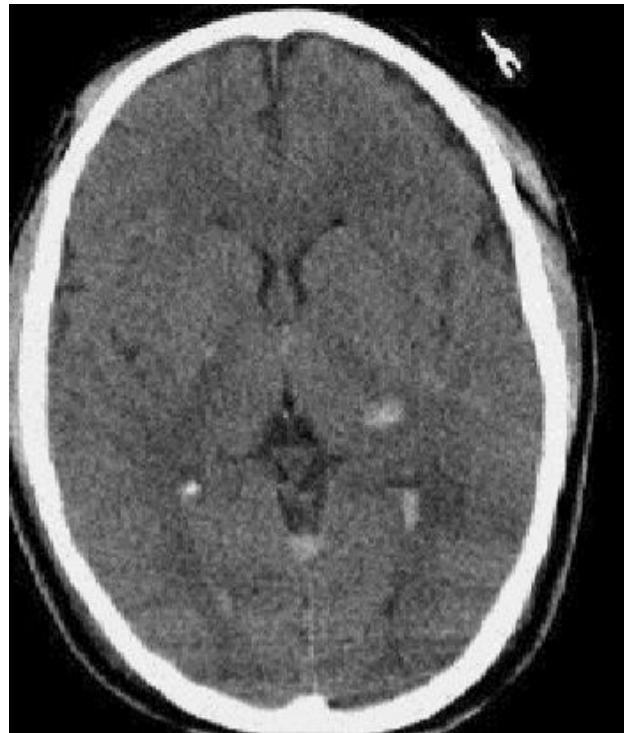
CT SCAN SHOWING SAH



CT SCAN SHOWING RT FTP ACUTE SDH WITH SHIFT



CT SCAN SHOWING TRAUMATIC IVH



DISCUSSION

Total number of patients seen from August 2011 to July 2012 is 150 patients.

Age and Sex

Total number of male	91
Total number of female	59

Total	150

Group I (Below 1 year)

Male	10
Female	3

Total	13

Group II (1 - 5 years)

Male	35
Female	32

Total	67

Group III (Above 5 years)

Male	46
Female	24

Total	70

AGE VS SEX

Age Group	Male		Female		Total	
	No	%	No	%	No	%
Group I	10	76.92	3	23.07	13	8.67
Group II	35	52.24	32	47.76	67	44.67
Group III	46	65.71	24	34.29	70	46.67

It is apparent from this analysis that male children have outnumbered female in all groups. Overall, Males have outnumbered female. Male - Female = 1.8: 1. As in the study of RL McLaurin, R. Towlin and in other Western studies, in this study also, the incidence of head injury is common with male children, but in group II sex incidence is similar. It correlates with the Indian equal study of P. Bharti et al. Male children tend to be lot more free than female children as they grow older as reflected by this. Our study shows paediatric head injuries more common in Group III since the growing children tries to explore things and may result in frequent falls and RTAs when playing on roadside.

MECHANISM OF INJURY

In our study, the commonest cause for head injury is fall in paediatric age group in all the subgroups followed by RTAs. This is in contrast with Western literature.

SEX VS MODE

Mode	Male	Female
Fall	49	30
FHO	0	2
RTA	42	25
Assault	0	1
TA	0	1

The commonest causes of head injury in this whole group is fall (52%) followed by RTA (44.6%). The incidence of head injury following RTA with group III significantly increases from 10.84% to 35.2%. This is easily explained as older children are no longer confined to the house and are let free to play outside. The study correlates with the results of Hendrick et al and Ramamoorthy et al and AC. Duhainet al..

Only one children was admitted with assault. Unlike western countries, none of a shaken baby syndrome has been identified in this study. No birth injury has been noticed may be because of the awareness and advanced obstetrical techniques.

Except for the mode of injury "Fall of objects" in all other modes like, fall, RTA, Domestic accidents, Assault and TA, Male children have outnumbered female children.

Vomiting

Total number of children presented with vomiting are 62 (41.33%).

Group I - 4 (6.45 %)

Group II - 32 (51.61%)

Group III- 26(41.94%)

Number of operable lesions presented with vomiting was 7. Of this 5 cases are depressed fracture for which wound debridement and evacuation done and two cases are EDH for which craniotomy and evacuation of EDH done.

Incidence Post Traumatic vomiting was common in group II followed by group III children. This study shows though the incidence of post traumatic vomiting is more common in pediatric head injury, this symptom correlating with raised ICP resulting in mass effect and surgical management is very less which is supported by other western literature.

ENT Bleed

Total	-	14	(9.33%)
Group I	-	1 case	(7.14%)
Group II	-	8 cases	(57.14%)
Group III	-	5 cases	(35.71%)

No one had developed CSF rhinorrhoea in all group. The commonest findings in these group is frontal bone fracture and naso-ethmoid complex fracture which is the same in other literature. Three cases underwent surgery for whom wound debridement and excision of fracture segment done.

Seizures

Total number of seizures	-	5	(3.33%)
Group I	-	0	
Group II	-	5	
Group III	-	0	

Seizures are more common in the group II patients.

The types of seizures noted are

Impact seizure	-	2cases
Focal seizure	-	1 case
GTCS	-	2 cases

All the cases are fractures with frontal bone fracture in 4 cases. For one case surgery was done all cases were started with appropriate anti-epileptic drugs and patients were seizure free before discharge.

AVERAGE HOSPITAL STAY

Group I	4.5 days
Group II	5.7 days
Group III	6.24 days

The duration of stay is lower in Group I and higher in Group III

Cranial nerve deficits

Cranial nerve Injury	No of pts
GROUP I	2
GROUP II	8
GROUP III	11

21 patients out of 150 had cranial nerve involvement (14 %)

2 patients in group I.

8 patients in group II.

11 patients in group III.

	No of Pts	II N	III N	VI N	VII N
Group I	13	0	1	1	0
Group II	67	0	1	0	7
Group III	70	1	3	2	5

The commonest cranial nerves involved in head injury is facial nerve and the recovery is good in almost all the cases. Secondly the 6th and 3rd nerves are involved only one optic nerve injury is noticed in this group and there was good outcome. 8th and lower cranial nerves are not involved in any one of these patients.

CT Findings :

Total no. of patients 613.

CT done for all 613 patients.

Of 613 patients 580 patients admitted with GCS 15 , of these 117 patients with GCS 15 had some CT findings. Remaining 463 patients with GCS 15 had normal CT finding and were discharged after observation.

Normal CT - 463
 Abnormal CT - 150

	NUMBER	IMPROVED	DEATH
EDH	14	14	0
SDH	04	04	0
CONTUSION	14	14	0
DAI	2	2	0
FRACTURES	67	67	0
OTHERS	16	16	0
MULTIPLE	34	28	6

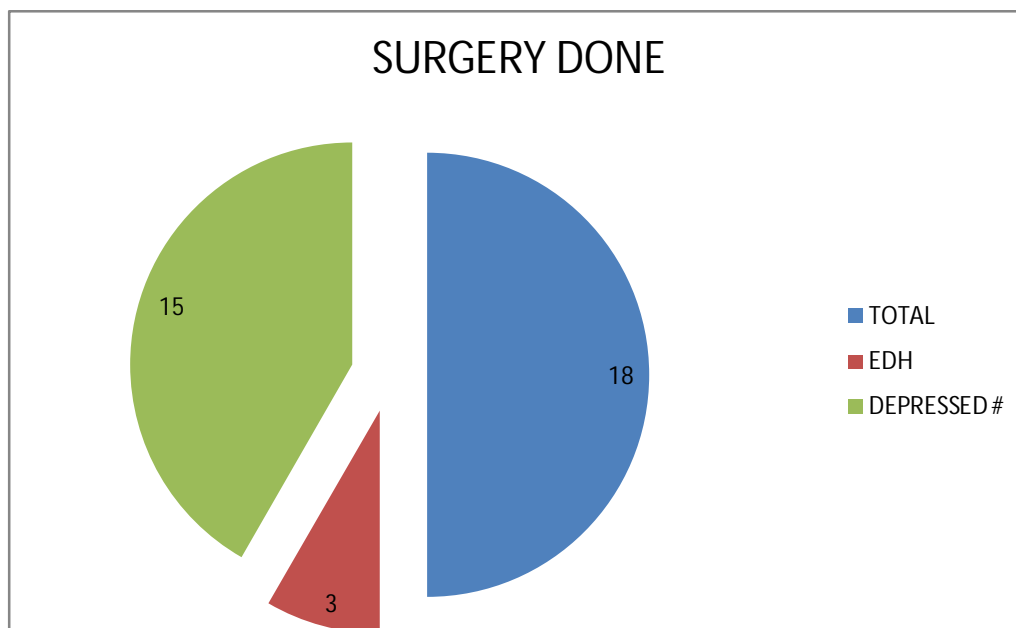
Study and Mode of Injury

Mode	Multiple	Fracture	EDH	SDH	OTHERS	CONTUSION	Normal CT
Fall	13	37	9	4	8	7	6
RTA	12	28	4	0	8	7	3
TA	1	0	0	0	0	0	0
Fall of objects	0	1	1	0	0	0	0
Assault	0	1	0	0	0	0	0

Surgery

Out of 150 children, 18 patients had undergone surgical treatment.

The remaining 132 patients were treated conservatively.



Management	Group I	Group II	Group III
Medical	12	57	63
Surgical	1	10	7

OUTCOME:

The outcome in this study are as follows:

Good	-	140	93.33%
Moderate disability	-	4	2.67%
Severe disability	-	0	0%
Vegetative state	-	0	0%
Death	-	6	4%

Age and Outcome

Age	Good	MD	SD	Veg	Dead
Below 1	13	0	0	0	0
Below 1-5	66	2	0	0	1
Below 6-12	63	2	0	0	5

In this study, the good outcome (90%) in paediatric head injury is correlating well with the other western studies. The outcome figures are more or less similar to the study of Michael & Bergers. We have noticed 4% death. This is correlating with the study of Pitts and Dereck D. Bruce et al. The outcome of moderate disability and severe disability is also

correlating with their study. But in their study vegetative states are noticed 2 to 3%. In this study outcome with vegetative state is NIL. Henrick et al. and Ramamoorthy et al. (1970) have also noticed absence of vegetative states in their studies.

MODE Vs OUTCOME

Mode	Outcome				
	Good	MD	SD	VS	Death
Fall	77	1	0	-	1
RTA	60	3	0	-	4
FHO	2	-	-	-	-
Assault	1	-	-	-	-
TA	0	-	-	-	1

In this study the good outcome from fall of various types is 90.78% (325/351).

Death due to falls is 1 out of 150 = 0.6%

Good outcome from RTA 60 out of 150 = 40%

Death due to RTA 12 out of 167 = 2.6%

The ratio of death due to fall and RTA are 1:4

The high percentage of death in RTA may be due to high velocity injuries.

In western studies also, the death rate is more in RTAs comparing with other modes of injury.

LOC and Outcome

Mode	Outcome				
	Good	MD	SD	VS	Death
Group I	6	-	-	-	-
Group II	32	2	-	-	1
Group III	37	2	-	-	3

Almost all the patients who have died had post-traumatic loss of consciousness (4 out of 6). There is no significant change in the pattern of outcome in both the groups.

VOMITING Vs OUTCOME

Mode	Outcome				
	Good	MD	SD	VS	Death
Group I	4	-	-	-	-
Group II	32	-	-	-	-
Group III	22	2	-	-	2

Percentage of children with vomiting is almost equal in group II and III in this study. Though the younger children are supposed to have higher incidence of vomiting according to literatures. Vomiting may simply be the manifestation of a hyperirritable young CNS reaction to trauma.

SEIZURES Vs OUTCOME

Mode	Outcome				
	Good	MD	SD	VS	Death
Group I	1	-	-	-	-
Group II	2	-	-	-	-
Group III	2	-	-	-	-

Out of 5 cases of seizures, 5 had good recovery (100%).

HOSPITAL STAY Vs OUTCOME

Group I	4.5 days
Group II	5.7 days
Group III	6.24 days

Good outcome	-	10.2 days
Moderate disability	-	20 days
Severe disability	-	-
Vegetative state	-	-
Dead	-	3.65 days

GCS / CCS with outcome

Outcome	GCS	Number of patients
Dead	>12	: 0
	9-12	: 1
	<9	: 5
Vegetative state		: 0
Severe		: 0
Moderate	>12	: 1
	9-12	: 2
	<9	: 1
Good GCS	>12	: 129
	9-12	: 11
	<9	: 1

No vegetative state has been noticed in this study.

GCS vs Outcome					
GCS	Dead	VS	SD	MD	Good
12-15	0	0	0	1	129
9-12	1	0	0	2	11
Upto 8	5	0	0	1	1

In this study it is observed that higher the GCS or CCS score, better the prognosis. With GCS, 13 to 15, no patients died out of 130 and there were 129 good outcome. In GCS 9-12, only 1 patient died out of 14 patients and there were 11 good outcome. In GCS 8 and below 8 out of 7 patients 5 died and 1 had good outcome 1 patient had moderate disability.

This study proves that higher the GCS or CCS score, better the prognosis and correlates well with other western literatures.

X-RAY FINDING AND OUTCOME

GCS vs Outcome					
CT	Dead	VS	SD	MD	Good
Contusion	-	-	-	-	14
EDH	-	-	-	-	12
DAI	1	-	-	1	2
Fractures	-	-	-	1	66
Multiple	5			2	46

Fissure fracture is the commonest pathology and is more common in and the prognosis was good. The incidence of depressed fracture is almost the same in both the Groups and the prognosis is good if treated promptly by surgery.

DAI AND OUTCOME

	Dead	Moderate	Good
GCS 13 - 15	-	-	9
GCS 9 - 12	-	1	1
GCS upto 9	1	0	-

Vegetative State – Nil

Good recovery - 10

NORMAL CT AND OUTCOME

Coma Score	Dead	VS	SD	MD	Good
GCS 13 - 15	0	0	0	0	7
9 - 12	0	0	0	4	1
Upto 9	0	0	0	0	0

In DAI out of 10 cases, 10 patients had good outcome . In comparing with the study of Antony M Alberico with Diffuse Axonal Injury the percentage of good outcome (100 %) in this study is much better than their study (51 %) and the mortality is also very less (0% Vs 16%).

The overall outcome in paediatric head injury is very good.

Good	-	140	93.33%
Moderate disability	-	4	2.67%
Severe disability	-	0	0%
Vegetative state	-	0	0%
Death	-	6	4%

93.3 % had good outcome, 2.67% had moderate disability and 0% had severe disability and there was not a single case of vegetative state. 4 % of patients died in these series. It is observed that there was poor prognosis in associated multiple injuries. The mortality rate in the study (4%) is nearly equal to the study report of Derek A Bruce et al.(6%)

CONCLUSION

Outcome is dependent on GCS score at the time of Therapeutic Intervention. Higher the score better the prognosis. Parenchymal injuries like contusions, though not rare, had a good prognosis, seldom requiring surgery and responding well to conservative treatment itself. Intracranial haematoma were very rare in children and the prognosis is good. Even in cases of prolonged unconsciousness no child had vegetative state indicating the neuronal plasticity in children and the greater ability to withstand trauma.

Majority of patients with either vomiting or seizures or both had a normal CT and both had no prognostic value. Multiple injuries carried a poor prognosis.

BIBLIOGRAPHY

1. Paediatric head trauma: influence of age and sex. Berney, J.; Froidevaux, A. -C.; Favier, J. Child's Nervous System vol. 10 issue 8 November 1994. p. 517 – 523
2. Rivara et al., in low fall like fall from table, bed etc., the common pathology encountered are concussion brain, fracture skull, ICH.
3. Toft AM, Moller H, Laursen B. The years after an injury: long-term consequences of injury on self-rated health. J Trauma 2010;69:26–30.
4. Greenes DS, Schutzman SA. Clinical indicators of intracranial injury in head-injured infants. Pediatrics.1999;104 :861– 867
5. Durkin et al., in the Journal of Neuro Surgery 1998 Feb, “Article epidemiology of urban paediatric neurological trauma; evaluation of and implications for, injury prevention programme”.Durkin et al, in Journal of Paediatrics June 1999. From “Epidemiology 2 prevention of traffic injuries to urban children and adolescents”.
6. Myhre MC , Grøgaard JB , Dyb GA , Sandvik L , Nordhov M . Traumatic head injury in infants and toddlers . Acta Paediatr 2007 ; 96 (8):1159 – 1163 .
7. Fundavo et al., From clinical nervous system official journal of international society for paediatric neuro surgery from July 2012 edition.

8. Homes et al., from academic emergency medicine: Official journal of society for academic emergency medicine Sep 2005.
9. Wang MY, Griffith P, Sterling J, et al. A prospective population-based study of pediatric trauma patients with mild alterations in consciousness (Glasgow Coma Scale score of 13-14).
10. Scalea TM, Simon HM, Ducan AO, et al. Geriatric blunt multiple trauma: improved survival with early invasive monitoring. *J Trauma* 1992;30:129–34
11. Schutzman SA. Clinical indicators of intracranial injury in head-injured infants. *Pediatrics*.1999;104 :861– 867
12. Schunk JE, Rodgerson JD, Woodward GA. The utility of head computed tomographic scanning in pediatric patients with normal neurologic examination in the emergency department. *Pediatr Emerg Care*. 1996;12:160–165
13. Mary E. Aitken, MD; Carla T. Herrerias, MPH; Robert Davis, MD, MPH; Hanan S. Bell, PhD; John B. Coombs, MD; Lawrence C. Kleinman, MD, MPH; Charles J. Homer, MD, Minor Head Injury in Children, Current Management Practices of Pediatricians, Emergency Physicians, and Family Physician. December 1998, Vol 152, No. 12
14. Rattan, Loudermilk E P, Hartmannsgruber M, Stoltzfus D P, Langevin P B. A prospective study of the safety of tracheal extubation using a pediatric airway exchange catheter for patients

with a known difficult airway. *Chest*. 1997;111:1660–1665

15. W R Murshid, Management of minor head injuries: admission criteria, radiological evaluation and treatment of complications. *Acta Neurochir (Wien)*. 1998 ;140 (1):56-64 9522909 Cit:17
16. Moran SG, McCarthy MC, Uddin DE, Poelstra RJ. Predictors of positive CT scans in the trauma patient with minor head injury. *American Surgeon* 1994,60(7):533-5
17. Inamasu J, Miyatake S, Suzuki M, et al. Early CT signs in out-of-hospital cardiac arrest survivors: temporal profile and prognostic significance. *Resuscitation*. 2010;81:534– 538.
18. Borzuck et al., from the archives of paediatric adolescent medicine “Childhood head injuries: accidental or inflicted”.
19. Mikhail et al., from school of Health and related research Sheffield UK “Diagnostic management stages for adult and children with minor head injuries: Systematic review”.
20. Stein et al., *Journal Paediatric* 2009, “Should head injury child receive a head injury scar” systemic review of the clinical prediction rules”.

ABBREVIATIONS

TBI	-	Traumatic Brain Injury
EDH	-	Extra Dural Haemorrhage
SDH	-	Sub Dural Haemorrhage
ICH	-	Intra Cerebral Haemorrhage
IVH	-	Intra Ventricular Haemorrhage
CNS	-	Central Nervous System
CTB	-	Computed Tomography of Brain
RTA	-	Road Traffic Accidents
MVA	-	Motor Vehicle Accidents
TTA	-	Train Traffic Accidents
GCS	-	Glasgow Coma Scale
GOS	-	Glasgow Outcome Scale
DAI	-	Diffuse Axonal Injury

MASTER CHART

S. No.	Name	Age	Sex	Min No	Mode of Injuries	No of days in hospital	Adm GCS	LOC	Vomiting	ENT bleed	Seizures	CT. Findings	Diagnosis	FRACTURE	PNEUMOC EPHALUS	DEP FRACTURE	EDH	SDH	Contusion	DAI	Management	Cranial Nerve Injuries	Other Injuries	GOS
7	Kishore	1	M	21190/11	F	5	15	1	1	0	0	FRA- RT TEMP	#Lat. wall of orbit R - Temporal born #	1	0	0	0	0	0	0	C	0	NIL	5
30	Rathinam	1	F	12223	RTA	3	15	1	1	1	1	FRA - RT FRON	R-F.B. # with underlying Haematoma	1	0	0	1	0	0	0	C	0	Nil	5
76	Kamalesh	1	M	522/12	RTA	1	15	1	0	0	0	N	Concussion	0	0	0	0	0	0	0	C	0	Nil	5
60	Ceeyan	1	M	21944	F	3	15	0	0	0	0	FRA - RT FRON	R-F.B.#	1	0	0	0	0	0	0	C	0	Nil	5
9	Deepak	2	M	10404	F	5	15	1	1	0	0	N	Concussion Brain	0	0	0	0	0	0	0	C	0	Nil	5
18	Satishkumar	2	M	78/11	F	5	15	1	1	0	0	FRA - RT PAR	R-Parietal bone Fissured #	1	0	0	0	0	0	0	C	VI RT	Nil	5
28	Rishi Kumar	2	M	6002	RTA	4	15	1	1	0	0	FRA - RT FRON	R-F.B.#	1	0	0	0	0	0	0	C	0	Nil	5
70	Asrath	2	M	23703	F	2	15	1	1	0	0	FRA - LT OCC	L - Occipital bone # with Haematoma	1	0	0	0	0	0	0	C	0	Nil	5
138	gurupriya	2	F	2334	F	2	15	1	0	0	0	FRA - LT OCC	# Occipital bone with thinn EDH	1	0	0	0	0	0	0	C	0	N	5
141	Kevin	2	M	2556	F	5	15	1	1	0	0	FRA - RT FRON	frontal bone #	1	0	0	0	0	0	0	C	0	N	5
147	Dhanalakshmi	1	F	4488	F	2	15	0	0	0	0	CON - RT PAR	RT Parietal	0	0	0	0	0	1	0	C	0	N	5
47	Deshar	2	F	10771	F	3	15	0	0	0	0	FRA - RT FRON	R - F.B. Closed Dep. #	1	0	1	0	0	0	0	C	0	Nil	5

54	Nithyasree	2	F	12076	F	3	15	0	0	0	0	MULTIPLE	L- P.B. # with thin EDH	1	0	0	1	0	0	0	C	0	Nil	5
20	Dhanalakshmi	2	F	1576/11	F	1	15	0	1	0	0	DAI	Fall with DAI with L- L.M.F.Palsy	0	0	0	0	0	0	DAI	C	0	NIL	5
14	Absar	2	M	33794/10	RTA	0	15	0	1	0	0	MULTIPLE	L-P.Bone # L-T.P.Small contusion	1	0	0	0	0	1	0	C	0	Nil	5
25	Ranjini	3	F	4274/11	FHO	2	15	1	0	0	0	FRA - RT FRON	R-F.B.Dep #	0	0	1	0	0	0	0	C	0	R - F. Bone # Injury	5
108	Poongavanam	2	F	2333	F	2	15	0	0	0	0	FRA - LT TEMP	L - T.B. # - # L - Roof of orbit	1	0	0	0	0	0	0	C	0	Nil	5
114	Jaya	2	F	5336	RTA	13	15	0	0	0	0	FRA - LT TEMP	L - T.B. compd .com Dep. #	1	0	0	0	0	0	0	Debridement excession of #	VII LT	Nil	5
57	Deepa	3	F	2270	FHO	15	15	1	0	0	0	EDH- LT FRON	L- F.EDH with Mass effect	0	0	0	1	0	0	0	Bicoronal Flap, L- Frontal craniotomy Evacratio	0	Nil	5
11	Deepika	3	F	22701	F	7	15	1	1	0	0	EDH - LT FRONTAL	L - Fraontal EDH # with Mass effect	1	0	0	1	0	0	0	Bicoronal Flap, L- Frontal craniotomy	0	Nil	5
31	Devanish	3	M	8117	F	3	15	1	1	0	0	FRA - OCC	Occipital bone #	1	0	0	0	0	0	0	C	0	Nil	5
86	Harish	3	M	2206/12	F	8	15	1	0	0	0	FRA - RT PAR	R - P. closed DEP #	1	0	0	0	0	0	0	R- P. Brurhole elevation 21.02.20 13	VII LT	Nil	5
66	Rohith	3	M	6567/11	F	3	15	1	1	1	0	FRA - LT FRON	L - F.B. # with # Orbital Bone	1	0	0	0	0	0	0	C	0	Nil	5
119	Priyadarshini	4	F	11023	RTA	11	15	0	1	1	1	FRA - RT PAR CCD	R - P.CC. Dep. #	1	0	1	0	0	0	0	Debridement excession of #	0	Nil	5
98	Praveen Kumar	3	M	75021	F	3	15	1	0	0	0	FRA - LT FRON	L - F.B. #	1	0	0	0	0	0	0	C	0	Nil	5

127	Arthi	3	F	11794	RTA	1	15	1	0	0	0	MULTIPLE	BL. IVH. With Diff. Cerebral oedema	0	0	0	0	0	0	0	C	0	N	5
61	Darshini Priya	2	F	9068/11	F	8	10	0	1	0	0	CON - RT TEMP	R - T.B.Contusion DAI. Post. Tranmatie seizure	0	0	0	0	0	1	0	C	0	Nil	5
88	Dharshini	3	F	2230	F	6	15	0	1	0	0	Tentorial SAH, IVH	Tentorial SAH, IVH	0	0	0	0	0	0	0	C	0	Nil	5
22	Roshini	5	F	2396/11	RTA	8	15	0	0	0	0	FRA - LT PAR	L- P.Comp.d.comm. Dep.#	0	0	1	0	0	0	0	Wound Debridement elevation of Dep. # Segments	0	Nil	5
140	thulasi	3	F	2345	RTA	2	15	1	0	0	0	FRA - RT TEMP	Rt temporal bone #	1	0	0	0	0	0	0	C	0	N	5
116	Kavisree	3	M	7651	RTA	13	15	0	1	1	1	FRA - LT TEMP	L - T.B. Comp.comm. Elevated #	1	0	0	0	0	0	0	C	0	Nil	5
19	Sevanthi	5	F	1157/11	RTA	8	11	1	0	0	0	FRA - RT PAR	R-P.Close.Dep #	0	0	1	0	0	0	0	Debridement Elevation of Dep. #	0	Nil	4
41	Srikanth	3	M	4931	F	3	15	0	0	0	0	FRA - LT FRON	L - F.B. # with Pneumocephalus	1	1	0	0	0	0	0	C	0	Nil	5
93	Naveenkumar	4	M	4357	RTA	18	10	1	1	0	0	Tentorial DAI. SAH	Tentorial DAI. SAH	0	0	0	0	0	0	DAI	C	0	Nil	5
121	Krithika	4	F	4362	RTA	18	7	1	0	0	0	SAH - LT PAR	SAH - LT PAR	0	0	0	0	0	0	0	C	0	Nil	4
52	Dinesh	3	M	11287	RTA	5	15	0	0	0	0	FRA - LT FRON	L - F.B. #	1	1	0	0	0	0	0	C	0	Nil	5
110	Dhansingh	4	F	1169	F	3	15	1	1	0	0	EDH- RT FRON	R - F.Thin EDH	0	0	0	1	0	0	0	C	0	Nil	5
90	Priyadarshini	3	F	2793	F	8	15	0	0	0	0	FRA - RT FRON	Committed # F.Bone with underlying Haematoma	1	0	0	0	0	0	0	C	0	Nil	5

107	Sasikumar	4	M	8077/12	RTA	2	15	1	0	0	0	MULTIPLE	Resolving R - P.Thin EDH, L - F.B. #	1	0	0	1	0	0	0	C	0	Nil	5
64	Deepa	4	M	15676/11	F	3	15	1	1	0	0	MULTIPLE	R - F.B. # with this EDH	1	0	0	1	0	0	0	C	VII RT	Nil	5
106	Sanjay Vignesh	3	M	6199/12	F	5	15	1	0	0	0	MULTIPLE	R- T.B. # with L - F.Contusion	1	0	0	0	0	1	0	C	0	Nil	5
115	Kirankumar	4	M	5506	RTA	7	13	1	1	1	0	FRA - LT TEMP	L- T.Bone # with # Body of sphenoid # - R - orbital #	1	0	0	0	0	1	0	C	0	Nil	5
126	Jeevitha	4	F	11009	RTA	1	4	1	0	0	0	MULTIPLE	R - T.B. Dep. # with B.Stem contusion	1	0	0	0	0	1	0	C	0	N	1
46	Naresh	5	M	16014	F	19	15	0	1	1	0	FRA - LT PAR CCD	L - P.B.Dep.# compd.comm	1	0	1	0	0	0	0	Wound Debridement Expressio	0	Nil	5
38	Annakodi	4	F	4679	RTA	11	15	0	1	0	0	MULTIPLE	R- F.B. # with EDH	1	0	0	1	0	0	0	C	0	Nil	5
77	Ramesh	4	M	579/12	RTA	2	15	0	1	0	0	FRA - OCC	# Occipital bone	1	0	0	0	0	0	0	C	0	Nil	5
118	Naresh	5	M	16014	RTA	19	15	1	0	0	0	FRA - LT FRON	L - F.C.C. Dep #	1	0	1	0	0	0	0	Debridement excessio n of #	0	Laceratio n over - L P.Emine	5
148	Harish Kumar	4	M	9876	RTA	1	15	0	1	0	0	FRA - RT FRON	Rt Frontal #	1	0	0	0	0	0	0	C	0	N	5
49	Deepak	2	M	10404	F	5	15	0	0	0	0	N	Concussion Brain	0	0	0	0	0	0	0	C	0	Nil	5
123	Chithra	4	F	9386	RTA	15	15	1	1	0	0	MULTIPLE	L - T.B. # with Tempt.contusion	1	0	0	0	0	1	0	C	0	Nil	5
150	ravi	4	M	4556	F	2	15	0	1	0	0	FRA - LT TEMP	LT TEMPORAL #	1	0	0	0	0	0	0	C	0	N	5
137	lokesh	4	M	2935	F	2	15	0	0	0	0	FRA - LT TEMP	Lt temporal bone #	1	0	0	0	0	0	0	C	0	N	5
139	Thilaggavathy	4	F	4555	F	3	15	0	0	0	0	FRA - LT TEMP	Lt temporal bone #	1	0	0	0	0	0	0	C	0	N	5

144	Vignesh	4	M	3455	RTA	2	14	0	0	0	0	MULTIPLE	Lt parietal # with EDH RtFRONTAL EDH	1	0	0	1	0	0	0	C	0	N	5
6	Kalai Selvi	5	F	4596/11	RTA	5	15	0	0	0	0	FRA- LT TEMP	L - T.B# with # R clavicle - mid - 1/3	1	0	0	0	0	0	0	C	VII LT	NIL	5
36	Shyam Prakash	5	M	9423	RTA	2	15	0	0	0	0	FRA - LT PAR	L - P.Bone #	1	0	0	0	0	0	0	C	0	Nil	5
1	Priyadarshini	5	F	7917/12	F	1	15	1	1	0	0	FRA - OCCIPITAL	Occipital bone #	1	0	0	0	0	0	0	C	VII RT	Nil	5
3	Dharshini	5	F	4050/11	RTA	8	15	1	1	1	0	FRA - FRONTAL	frontal bone #	1	0	0	0	0	0	0	C	0	Nil	5
53	Killajee	5	F	11622/11	RTA	11	14	1	1	1	0	FRA - RT FRON	R - F.B. # Diffuse cerebral oedema	1	0	0	0	0	0	0	C	0	Nil	5
63	Deepa Laxmi	5	F	17623/11	RTA	5	15	0	0	0	0	FRA - RT FRON CCD	R - F.B. Compd. Comm. Dep. #	1	0	1	0	0	0	0	C	0	Nil	5
124	Christopher	5	M	4384	RTA	12	9	0	0	0	0	MULTIPLE	L - F.B.Dep. # with L - F.Contusion	1	0	0	0	0	1	0	Debridement excessio n of #	0	Nil	5
135	Manikandan	5	M	7452	RTA	1	15	1	0	0	0	Normal	DAI	0	0	0	0	0	0	DAI	C	0	N	5
102	Tharun	5	M	2916	F	4	15	1	1	1	0	FRA - LT FRON	L - F. Bone # with Haematoma	1	0	0	0	0	0	0	C	0	Nil	5
104	Sanjay	5	M	6554	F	5	15	1	1	0	0	DAI	DAI	0	0	0	0	0	0	DAI	C	0	Nil	5
29	Nagesh	7	M	6132	F	10	15	0	0	0	0	FRA - LT FRON	L- F.B.Comp.d.comm . Dep #	0	0	1	0	0	0	0	Wound Debridement Excessio	0	Nil	5
84	Sawan	4	M	1549	F	4	10	0	0	0	0	CON - LT PAR	CONTUSION LT PARIETAL	0	0	0	0	0	1	0	C	0	Nil	5
109	Dhanush	5	M	3211	RTA	5	15	1	1	0	0	FRA - RT FRON	R- F.B.Linear with Resorting Haematama	1	0	0	0	0	0	0	C	0	Nil	5

2	Deepika Pushpalatha	6	F	2272/12	F	9	15	1	0	0	0	N	DAI	0	0	0	0	0	0	DAI	C	0	Nil	5
145	Saliya Begum	5	F	2094	RTA	2	15	1	1	0	0	MULTIPLE	occipital bone # pf EDH	1	0	0	1	0	0	0	C	0	N	5
81	Shalini	5	F	1544/12	F	1	12	0	1	0	0	FRA - RT TEMP	R - Bone #	1	0	0	0	0	0	0	C	VII LT	R-Clavica # R-Scapila #	5
71	Tharun	1	M	23456	RTA	5	15	0	0	0	0	N	DAI	0	0	0	0	0	0	0	C	0	No	5
92	Vadeeswari	5	F	7819	F	6	15	0	0	0	0	FRA - RT FRON	R - F.T. Bone #	1	0	0	0	0	0	0	C	VII LT	Nil	5
149	Yuvasri	5	F	5679	F	3	15	1	0	0	0	CON - LT FRON	LT FRONTAL CONTUSION	0	0	0	0	0	1	0	C	0	N	5
4	Sanjay	6	M	4108/11	F	5	11	0	0	0	0	EDH - LT FRONTAL	L - F.Bone linear # with small EDH	1	0	0	0	0	0	0	C	0	Nil	5
134	KARTHIKA	5	M	1123	RTA	1	9	0	0	0	0	EDH - LT FRONTAL	EDH - LT FRONTAL	0	0	0	1	0	0	0	C	0	N	5
33	Deepak Kumar	7	M	9006	F	21	15	1	0	0	0	SDH - RT FTP	R-F,P thin SDH	0	0	0	0	1	0	0	C	VII RT	Nil	5
100	Md Jakiria	6	M	6474	F	2	15	1	1	0	0	Concussion brain	Concussion brain	0	0	0	0	0	0	0	C	0	Nil	5
80	Ramya Sree	6	F	1347/12	RTA	1	15	0	0	0	0	MULTIPLE	Bi.P.Bone # with underlying EDH	1	0	0	1	0	0	0	C	0	Nil	5
142	chandana	6	F	7888	F	3	15	0	0	0	0	EDH - LT FRONTAL	Lt frontal EDH	1	0	0	1	0	0	0	C	0	N	5
67	Nandhini	7	F	22073	RTA	6	15	0	0	0	0	FRA - LT PAR	L - P.B. Comp. com. Dep. #	1	0	0	0	0	0	0	# Elevation done	0	# CLAVICLE	5

83	Depika Pushpalatha	6	F	2273/11	F	9	11	0	1	0	0	N	DAI	0	0	0	0	0	0	0	C	0	Nil	5
10	Nisha	7	F	22271	F	10	15	1	0	0	0	MULTIPLE	L - Fraontal bone # pneumo cephalus with CSE Rhinorrhea	1	1	0	0	0	0	0	C	0	Nil	5
78	Raja	7	M	871/12	RTA	1	15	0	0	0	0	MULTIPLE	R - Frontal ICH R - F.EDH	0	0	0	1	0	0	0	C	0	Nil	5
39	Raja	8	M	9197/11	RTA	8	15	1	1	1	0	FRA - LT PAR CCD	L - P.Comp. Comm.Dep #	0	0	1	0	0	0	0	Wound Debridement Excessio	0	Nil	5
68	Nisha	7	F	22271	F	10	9	1	0	0	0	FRA - LT FRON	L - F.B. # with Pneumocephalus	1	1	0	0	0	0	0	C	0	NIL	5
48	Kalaiselvi	7	F	9107	RTA	4	15	0	1	0	0	FRA - LT TEMP	L - T.B. #	1	0	0	0	0	0	0	C	0	Nil	5
120	Diwakar	7	M	3290	RTA	12	13	1	0	0	0	CON - RT FRON	R - F.Ich.	0	0	0	0	0	0	0	C	0	Nil	5
50	Ajay	7	M	10868	RTA	3	15	0	0	0	0	CON - LT PERISYLVIAN	L - Peri sylvian contusion	0	0	0	0	0	1	0	C	0	Nil	5
111	Praveen Kumar	7	M	5741	F	8	15	1	0	0	0	FRA - LT PAR CCD	L - P.Comp. com. Dep. #	1	0	0	0	0	0	0	C	0	Nil	5
130	Balaji	7	M	15321	F	4	15	1	1	0	0	FRA - RT FRON	undisplaced R - F.Bone #	1	0	0	0	0	0	0	C	0	N	5
79	Harini	7	F	251/12	RTA	3	13	1	1	0	0	MULTIPLE	R- orbital bone # with Haemoohagic contusion	1	0	0	0	0	1	0	C	III RT	1. # Shaf. L Human, 2. #	5
122	Kannan	7	M	1770	F	8	13	1	0	0	0	FRA - LT PAR	# P.O. Bone with # Haematoma	1	0	0	0	0	0	0	C	0	Nil	5
12	Deepakumar	7	M	9006	F	5	13	1	1	0	0	EDH - RT PARIETAL	R-P-Occipital thin EDH - Midline shift	0	0	0	1	0	0	0	C	0	Nil	5
43	Dhaxshna Moorthi	8	M	8425	RTA	11	15	0	0	0	0	FRA - LT PAR	L - P.B.Dep.#	1	0	1	0	0	0	0	C	VII RT	Nil	5

51	Nivedha	9	F	11252	F	5	15	0	1	0	0	SDH - LT TEMP	L - T.B. THIN SDH	0	0	0	0	1	0	0	C	VIRT	Nil	5
35	Anitha	9	F	9124/11	A	5	15	1	1	0	0	FRA - RT OCC	R - OCCIPITAL Dep.#	0	0	1	0	0	0	0	C	0	Nil	5
23	Kesavan	9	M	3521/11	RTA	4	15	1	1	0	0	N	Concussion	0	0	0	0	0	0	0	C	0	Nil	5
87	Jothika	8	F	3005/12	F	3	11	1	0	0	0	CON- LT TEMPPAR	L - T.P. Contusion	0	0	0	0	0	1	0	C	0	Nil	5
96	Kesavan	8	M	5934	RTA	4	15	1	0	0	0	MULTIPLE	Occipital bone # with cerelellar Haemorrhage	1	0	0	0	0	1	0	C	0	Nil	5
65	Dinesh	8	M	19454	RTA	5	15	0	0	0	0	FRA - LT TEMP	L - T.B. #	1	0	0	0	0	0	0	C	0	Nil	5
75	Gokul	8	M	77/12	RTA	1	15	0	0	0	0	FRA - RT FRON CCD	R - F.B. Compd. Comm. Dep. #	1	0	0	0	0	0	0	Bicoronal Flap, wound debride	0	Nil	5
62	Keertha	8	F	11040	F	13	15	1	0	0	0	FRA - LT PAR	L - P.B. Fissured #	1	0	0	0	0	0	0	C	0	Nil	5
143	chandra	7	F	5678	RTA	2	15	1	0	0	0	EDH - LT TEMP	LTemporal polar EDH	0	0	0	1	0	0	0	C	0	N	5
13	Shameer	9	M	3379	RTA	6	15	1	0	0	0	CON-RT FP	R-F.T.P.gang ccap contusion	0	0	0	0	0	1	0	C	0	Nil	5
105	Sivasakti	6	M	6422	F	3	15	0	0	0	0	SAH - LT PAR	L - High Parietal SAH	0	0	0	0	0	0	0	C	0	Nil	5
32	Aravinth	10	M	5677	F	1	15	0	0	0	0	FRA - RT PAR	R- P.Bone closed Dep.#	0	0	1	0	0	0	0	C	0	Nil	5
91	Ja	8	F	3873	F	4	15	1	0	0	0	FRA - LT TEMP	L - T.Bone #	1	0	0	0	0	0	0	C	0	Nil	5
27	Santhia	9	F	4584	F	3	15	1	0	0	0	MULTIPLE	R-T.B.# with B1 Fronta contusion	1	0	0	0	0	1	0	C	0	0	5
103	Sidharth	7	M	1302	RTA	3	15	0	0	0	0	EDH - LT FRONTAL	L - F.thin EDH	0	0	0	1	0	0	0	C	0	Nil	5
95	Raresh Kumar	9	M	5827	RTA	6	8	1	0	0	0	CON - RT TEMP PAR	P.T.Concussion	0	0	0	0	0	1	0	C	VILT	Nil	5

101	Hari Prasad	9	M	4322	F	12	15	0	0	0	0	MULTIPLE	R - F.B. # with EDH	1	0	0	1	0	0	0	C	0	Nil	5	
42	Kalaivani	9	F	6341/11	RTA	5	15	1	1	1	0	FRA - RT FRON	R - F.B. Fissured #	1	0	0	0	0	0	0	C	0	Ethmax B. #	5	
89	Arun	9	M	2884	F	7	15	1	1	0	0	FRA - OCC	Occipital bone # committd	1	0	0	0	0	0	0	C	0	Nil	5	
82	Jesima	9	F	4012	F	1	15	1	0	0	0	EDH - RT PARIETAL	R - P.Thint EDH	0	0	0	1	0	0	0	C	0	N	5	
99	Keerthana	10	F	7908/12	RTA	5	14	0	0	0	0	CON - RT FRON	R - Frontal contusion	0	0	0	0	0	1	0	C	VII LT	Nil	5	
85	Nithish Kumar	10	M	2205	F	5	15	0	1	0	0	MULTIPLE	L - F.P. Closed DEP. # with underlying this SDH	1	0	0	1	0	1	0	C	0	Nil	5	
24	Selvan	10	M	4126	RTA	4	15	1	1	1	1	FRA - RT TEMP	R-T.B. # with R - VII CN UMN-PALSY	1	0	0	0	0	0	0	C	VII RT	0	5	
26	Asriah	10	M	8265	F	7	15	1	1	1	0	FRA - LT FRON	L - F.B. Compd.comm.De p #	0	0	1	0	0	0	0	C	Wound Debridement elevation of Dep. # Bone	0	0	5
97	Babu	10	M	6189	F	7	15	0	1	1	1	FRA - RT FRON	R - F.B. # with thin Hamemorrhage	1	0	0	1	0	0	0	C	0	Nil	5	
125	Jallaya	10	F	7016	TA	28	4	0	1	0	0	MULTIPLE	R - T.B. Dep. # with L - F.Contusion	1	0	1	0	0	1	0	C	0	N	1	
129	Thiruvikraman	10	M	7557	RTA	4	5	1	0	0	0	DAI	Diff. C. Oedema claviece #	0	0	0	0	0	0	0	C	0	R-Clavicle #	1	
131	Baby	10	F	11086	RTA	1	5	0	1	0	0	MULTIPLE	L - F.T.P. Multiple Haemavagic contusion	1	0	0	0	0	1	0	C	0	Nil	1	

136	Siva	10	M	1233	RTA	1	15	1	1	0	0	EDH - LT FRONTAL	Lt Frontal EDH	1	0	0	1	0	0	0	C	0	N	5
17	Anilkumar	11	M	1250	F	3	15	0	0	0	0	FRA - OCC	Midocibital bone #	1	0	0	0	0	0	0	C	0	Nil	5
146	Shagul Hameed	10	M	3990	F	3	15	1	0	0	0	EDH - RT TEMP PAR	RT TP EDH	0	0	0	1	0	0	0	C	0	N	5
15	Rabin	11	M	33760/10	RTA	13	15	0	1	0	0	MULTIPLE	L-T.P.Dep # E L- T.P.EDH	1	0	1	0	0	0	0	L - FTP craniotomy 01.01.11	0	Nil	5
69	Keertha	11	F	23436	RTA	13	14	0	0	0	0	MULTIPLE	R - F.this EDH R- Temp. contusion R- Maxilla # R- orbital bone #	1	0	0	1	0	0	0	C	II RT	R- Maxilla # R- Orbital	5
128	Kalaivanan	5	M	12229	RTA	13	15	0	0	0	0	IVH	BL .IVH	0	0	0	0	0	0	0	C	0	N	5
45	Abdul Rahman	11	M	4938	RTA	3	14	1	0	0	0	CON - RT PAR	R - P.Contusion	0	0	0	0	0	1	0	C	0	Nil	5
21	Karthikeyan	11	M	19521	F	4	15	1	1	0	0	CON - RT CEREBELLAR	R-Ceretellar contusion	0	0	0	0	0	1	0	C	0	0	5
44	Kubendran	11	M	10072/11	RTA	16	9	1	1	0	0	DAI	DAI	0	0	0	0	0	0	DAI	C	0	Nil	4
112	Akash	11	M	6243	F	6	15	0	1	0	0	MULTIPLE	L - F.B. # with small contusion	1	0	0	0	0	1	0	Debridement excessio n of # fragment s	0	Nil	5
113	Priya	11	F	2992	F	7	15	1	0	0	0	FRA - RT FRON	R - F.B. Dep. #	1	0	0	0	0	0	0	C	0	Nil	5
58	Abdul Jabbar	11	M	21708	F	1	15	0	1	0	0	EDH - RT TEMP	R - T.B. # with R - T.Tesis EDH Lat. Wall R - orbit	1	0	0	1	0	0	0	C	III LT	Nil	5
56	Aarthi	11	F	18669	F	3	15	1	1	0	0	CON - LT FRON	L - Basifrontal contusion	0	0	0	0	0	1	0	C	0	Nil	5
133	Kannan	11	M	12533	F	2	9	1	0	0	0	MULTIPLE	R-F.B. # with BL. F. Pneumoaphalus	1	1	0	0	0	0	0	C	0	# Proximal Humero # SOF	1
37	Appu	12	M	7656	RTA	5	15	1	0	0	0	MULTIPLE	R - O.B. # with Pneumocephalus	1	1	0	0	0	0	0	C	0	Nil	5

40	Sadam Hussain	12	M	4943/11	F	8	11	1	0	0	0	MULTIPLE	R - Squmons - T.B. # R-OC.B. # L - P.T.B. #	1	0	0	0	0	0	C	0	Nil	5	
94	Suresh	12	M	4563	RTA	6	15	0	0	0	0	CON - RT PERISYLVIAN	R - Peri Sylin contusion	0	0	0	0	0	1	0	C	0	Nil	5
73	Nizamudeen	12	M	32/12	F	5	15	1	0	0	0	EDH - RT OCC	P.O. area with min EDH	1	0	0	1	0	0	0	C	0	Nil	5
132	Chithan	12	M	13034	RTA	12	7	1	0	0	0	MULTIPLE	R - T.B. # R-Sphoid Bone # Diffuse .C. Oedema	1	0	0	0	0	0	0	C	VII LT	Nil	1
117	Kavi Raj	11 MON TH	M	3687	RTA	5	15	0	0	0	0	FRA - LT TEMP	# L - T.B.	1	0	0	0	0	0	0	C	0	Nil	5
59	Arun	12	M	21900	RTA	11	14	1	0	0	0	MULTIPLE	L - F.Contusion with # L - Zygoma complex	1	0	0	0	0	1	0	C	III LT	0	5
72	Satishkumar	3 MON TH	M	21222	F	7	15	1	0	0	0	SDH - LT PAR	L - P.O. This SDH	1	0	0	0	1	0	0	C	0	Nil	5
16	Nihar	5 MON	F	355/11	F	5	15	1	0	0	0	FRA - RT TEMP	R-T.Bone #	1	0	0	0	0	0	0	C	0	Nil	5
55	Asis	10 MON	M	18526	F	16	15	0	0	0	0	MULTIPLE	R- P.B. # with thin EDH	1	0	0	1	0	0	0	C	III RT	Nil	5
74	Manikandan	5 MON TH	M	31.06.2012	F	1	15	0	1	0	0	FRA - RT FRON CCD	R - F.comp. Comm. DEP #	1	0	0	0	0	0	0	Wound Debridement Excessio	VI RT	Nil	5
5	Dilipkumar	12	M	4198/11	F	8	12	1	1	0	0	SDH - RT FTP	R-FTP acute SDH	0	0	0	0	1	0	0	C	0	Nil	4
34	Nithish	8 MON	M	10899	F	1	15	1	1	0	0	MULTIPLE	R - P.Bone with # Haematoma	1	0	0	1	0	0	0	C	0	Nil	5
8	Nithish	8 MON TH	M	10899/11	F	5	15	0	0	0	0	MULTIPLE	R - Parietal # R-P. # Haematoma R-P. contusion	1	0	0	1	0	1	0	C	0	Nil	5

INFORMATION SHEET

We are conducting “ A STUDY ON PAEDIATRIC HEAD INJURY PATIENTS UNDER 12 YEARS” among patients attending Rajiv Gandhi Government General Hospital, Chennai and for that your specimen may be valuable to us.

- The purpose of this study is to analyse the various abnormal CT findings in head injury patients under 12 years
- We are selecting certain cases and if your radiological image is found eligible, we may be using your specimen to perform extra tests and special studies which in any way do not affect your final report or management.
- The privacy of the patients in the research will be maintained throughout the study. In the event of any publication or presentation resulting from the research, no personally identifiable information will be shared.
- Taking part in this study is voluntary. You are free to decide whether to participate in this study or to withdraw at any time; your decision will not result in any loss of benefits to which you are otherwise entitled.
- The results of the special study may be intimated to you at the end of the study period or during the study if anything is found abnormal which may aid in the management or treatment.

Signature of investigator

Signature of participant

Date:

ஆராய்ச்சி ஒப்புதல் கடிதம்

ஆராய்ச்சி தலைப்பு: “A STUDY OF PAEDIATRIC HEAD INJURY PATIENTS UNDER 12 YEARS” பற்றிய ஆய்வு

பெயர்: வயது /பால் :

தேதி:

ஆராய்ச்சி சேர்க்கை எண்.

- ராஜீவ் காந்தி அரசு மருத்துவக்கல்லூரி மற்றும் அரசு பொது மருத்துவமனையின் நரம்பியல் அறுவை சிகிச்சைத் துறையில் “A STUDY OF PAEDIATRIC HEAD INJURY PATIENTS UNDER 12 YEARS” பற்றிய ஆய்வு நடைபெறுகிறது என்பதை அறிந்து கொண்டேன்.
- சிடி ஸ்கேன் மற்றும் எம்.ஆர்.ஐ. ஸ்கேன் ஆகியவற்றின் அடிப்படையில் இந்த ஆய்வு நடைபெறுகிறது என்பதையும் மேலும் அறுவை சிகிச்சையின் போது நேரடியாக பார்க்கப்படுவதை வைத்தும் ஆய்வு நடைபெறுகிறது என்பதையும் அறிந்து கொண்டேன்.
- இவ்வாய்வில் கலந்து கொள்பவர்களின் சொந்த தகவல்கள் ரகசியமாக பாதுகாக்கப்படும் என்பதையும் இந்த ஆய்வின் முடிவுகளை பிரசுரிக்கும்போது அல்லது வெளியிடும்போதோ எனது தகவல்கள் ஏதும் வெளியிடப்படாது என்பதையும் அறிந்து கொண்டேன்.
- இந்த ஆராய்ச்சியிலிருந்து எந்த நேரமும் பின் வாங்கலாம் என்றும், அதனால் எந்த பாதிப்பும் ஏற்படாது என்பதையும் அறிந்து கொண்டேன்.
- இந்த ஆய்வில் பங்குபெற அல்லது விலகிக்கொள்ள எனக்கு முழு சுதந்திரம் உண்டு என்பதையும், இந்த ஆய்வில் இருந்து நான் விலகிகொண்டாலும் எனக்கு கிடைக்க வேண்டிய சிகிச்சை தொடர்ந்து கிடைக்கும் என்பதையும் அறிந்து கொண்டேன்.
- இந்த ஆராய்ச்சியின் விவரங்களும், அதன் நோக்கங்களும் எனக்கு தெளிவாக விளக்கப்பட்டது. எனக்கு விளக்கப்பட்ட விவரங்களை புரிந்து கொண்டு, இந்த ஆய்வில் கலந்து கொள்ள சம்மதிக்கிறேன்.
- இந்த ஆராய்ச்சியில் பிறரின் நிர்பந்தமின்றி என் சொந்த விருப்பத்தின் பேரில் தான் பங்கு பெறுகிறேன்.

கையொப்பம்

ஆராய்ச்சி தகவல் தாள்

- தங்களின் சிஐ ஸ்கேன்/எம்.ஆர்.ஐ.ஸ்கேன் படம் அல்லது படத்தின் நகல் அல்லது படத்தின் நிழல்படம் இங்கு பெறப்பட்டுள்ளது.
- ராஜீவ் காந்தி அரசு மருத்துவக்கல்லூரி மற்றும் அரசு பொது மருத்துவமனையின் நரம்பியல் அறுவை சிகிச்சைத் துறையில் “A STUDY OF PAEDIATRIC HEAD INJURY PATIENTS UNDER 12 YEARS” பற்றிய ஆய்வு நடைபெறுகிறது என்பதை அறிந்து கொண்டேன்.
- சிடி ஸ்கேன் மற்றும் எம்.ஆர்.ஐ. ஸ்கேன் ஆகியவற்றின் அடிப்படையில் இந்த ஆய்வு நடைபெறுகிறது
- இவ்வாய்வில் கலந்து கொள்பவர்களின் சொந்த தகவல்கள் ரகசியமாக பாதுகாக்கப்படும்
- இந்த ஆய்வின் முடிவுகளை பிரசுரிக்கும்போது அல்லது வெளியிடும்போதோ தங்களின் சொந்த தகவல்கள் ஏதும் வெளியிடப்படாது.
- இந்த ஆய்வில் பங்குபெற அல்லது விலகிக்கொள்ள உங்களுக்கு முழு சுதந்திரம் உண்டு.
- இந்த ஆய்வில் இருந்து நீங்கள் விலகிகொண்டாலும் உங்களுக்கு கிடைக்க வேண்டிய சிகிச்சை தொடர்ந்து கிடைக்கும்.

ஆராய்ச்சியாளர் கையொப்பம்

பங்கேற்பாளர் கையொப்பம்

நாள்

INFORMED CONSENT FORM

Title of the study : “ A STUDY ON PAEDIATRIC HEAD INJURY PATIENTS UNDER 12 YEARS”

Name of the Participant: Dr. M.A. Bose

Name of the Principal (Co-Investigator): Prof. Dr. Deiveegan

Name of the Institution: Institute of Neurology, MadrasMedicalCollege and RajivGandhiGovernment GeneralHospital, Chennai

Name and address of the sponsor / agency (ies) (if any):None.

Documentation of the informed consent

I _____ have read the information in this form (or it has been read to me). I was free to ask any questions and they have been answered. I am over 18 years of age and, exercising my free power of choice, hereby give my consent to be included as a participant in “ A STUDY ON PAEDIATRIC HEAD INJURY PATIENTS UNDER 12 YEARS”

1. I have read and understood this consent form and the information provided to me.
2. I have had the consent document explained to me.
3. I have been explained about the nature of the study.
4. I have been explained about my rights and responsibilities by the investigator.
5. I have been informed the investigator of all the treatments I am taking or have taken in the past _____ months including any native (alternative) treatment.
6. I have been advised about the risks associated with my participation in this study.*
7. I agree to cooperate with the investigator and I will inform him/her immediately if I suffer unusual symptoms. *
8. I have not participated in any research study within the past _____month(s). *
9. I have not donated blood within the past _____ months—Add if the study involves extensive blood sampling. *
10. I am aware of the fact that I can opt out of the study at any time without having to give any reason and this will not affect my future treatment in this hospital. *
11. I am also aware that the investigator may terminate my participation in the study at any time, for any reason, without my consent. *
12. I hereby give permission to the investigators to release the information obtained from me as result of participation in this study to the sponsors, regulatory authorities, Govt. agencies, and IEC. I understand that they are publicly presented.
13. I have understand that my identity will be kept confidential if my data are publicly presented
14. I have had my questions answered to my satisfaction.

15. I have decided to be in the research study.

I am aware that if I have any question during this study, I should contact the investigator. By signing this consent form I attest that the information given in this document has been clearly explained to me and understood by me, I will be given a copy of this consent document.

For adult participants:

Name and signature / thumb impression of the participant (or legal representative

if participant incompetent)

Name _____ Signature _____

Date _____

Name and Signature of impartial witness (required for illiterate patients):

Name _____ Signature _____

Date _____

Address and contact number of the impartial witness:

Name and Signature of the investigator or his representative obtaining consent:

Name _____ Signature _____

Date _____

For Children being enrolled in research:

Whether child's assent was asked: Yes / No (Tick one)

[If the answer to be above question is yes, write the following phrase:

You agree with the manner in which assent was asked for from your child and given by your child. You agree to have your child take part in this study].

[If answer to be above question No, give reason (s)

:_____.

Although your child did not or could not give his or her assent, you agree to your child's participation in this study.

Name and Signature of / thumb impression of the participant's parent(s) (or legal representative)

Name _____ Signature _____

Date _____

Name _____ Signature _____

Date _____

Name and Signature of impartial witness (required for parents of participant child illiterate):

Name _____ Signature _____

Date _____

INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE, CHENNAI -3

Telephone No : 044 25305301
Fax : 044 25363970

CERTIFICATE OF APPROVAL

To
Dr.M.A.Bose,
Post Graduate in Neurosurgery,
Madras Medical College,
Chennai -3

Dear Dr. M.A.Bose

The Institutional Ethics committee of Madras Medical College, reviewed and discussed your application for approval of the proposal entitled "A study on Paediatric Head Injury patients under 12 Years – Our Institutional Experience" No.26122012.

The following members of Ethics Committee were present in the meeting held on 11.12.2012 conducted at Madras Medical College, Chennai -3.

- | | | |
|--|-----|------------------|
| 1. Dr.S.K.Rajan, M.D.FRCP, DSc | --- | Chairperson |
| 2. Prof. R. Nandhini MD
Director, Instt. of Pharmacology ,MMC, Ch-3 | -- | Member Secretary |
| 3. Prof. Dr.A.Radhakrishnan MD
Director , Inst. Of Internal Medicine, MMC, Ch-3 | -- | Member |
| 4. Prof. Meenalochani, MD
Director , Instt. of O& G, Chennai | -- | Member |
| 5. Prof. Shyamraj MD
Director i/c , Instt. of Biochemistry , MMC, Ch-3 | -- | Member |
| 6. Prof. P. Karkuzhali. MD
Prof., Instt. of Pathology, MMC, Ch-3 | -- | Member |
| 7. Prof. S.Devivanayagam MS
Prof of Surgery, MMC, Ch-3 | -- | Member |
| 8. Thiru. S. Govindsamy. BA, BL | -- | Lawyer |
| 9. Tmt.Arnold Saulina MA MSW | --- | Social Scientist |

We approve the proposal to be conducted in its presented form.

Sd/ Chairman & Other Members

The Institutional Ethics Committee expects to be informed about the progress of the study, and SAE occurring in the course of the study, any changes in the protocol and patients information / informed consent and asks to be provided a copy of the final report.

R Nandini 21/12/12
Member Secretary, Ethics Committee



Turnitin Originality Report

ANALYSIS OF PAEDIATRIC HEAD
INJURIES by Bose Alwar 18101502 M.Ch.
Neuro Surgery

From Medical (TNMGRMU APRIL 2013
EXAMINATIONS)

Similarity Index	Similarity by Source	
22%	Internet Sources:	16%
	Publications:	13%
	Student Papers:	1%

Processed on 31-Mar-2013 00:26 IST

ID: 316281044

Word Count: 5857

sources:

- 1

9% match (Internet from 11-Sep-2009)

<http://www.ijccm.org/article.asp?issn=0972-5229;year=2004;volume=8;issue=2;spage=85;epage=92;aulast=Khilnani>
- 2

2% match (publications)

["Abstracts", American Journal of Transplantation, 4/2002](#)
- 3

2% match ()

<http://rad.usuhs.mil/medpix/medpix.html?mode=single&recnum=3826&comebackto=%22mode%3Dtsearch%3Dsrchstr%3Dmultiple%20sclerosis%20%20diagnostic%20>
- 4

1% match (Internet from 25-Oct-2010)

<http://lib.bioinfo.pl/pmid:9973681>
- 5

1% match (publications)

[W.R. Murshid. "Management of Minor Head Injuries: Admission Criteria, Radiological Evaluation and Treatment of Complications", Acta Neurochirurgica, 01/27/1998](#)
- 6

1% match (Internet from 24-Jan-2010)

<http://lib.bioinfo.pl/meid:76122>
- 7

1% match (Internet from 30-Aug-2011)

<http://archpedi.ama-assn.org/cgi/content/full/152/12/1176>
- 8

1% match (publications)

[Borczuk, P.. "Predictors of Intracranial Injury in Patients With Mild Head Trauma", Annals of Emergency Medicine, 199506](#)
- 9

1% match (Internet from 16-Sep-2010)

<http://list.mistral.net/pipermail/trauma-list/attachments/20050516/b2f20480/CTHEAD-0001.doc>
- 10

1% match (publications)

[Inamasu, J.. "CT scans essential after posttraumatic loss of consciousness", American Journal of Emergency Medicine, 200011](#)
- 11

1% match (publications)

[Neogy, A.B.. "Exploitation of parasite-derived antigen in therapeutic success against canine visceral leishmaniosis", Veterinary Parasitology, 199409](#)
- 12

< 1% match (publications)

[Sureyya Dikmen, "Functional Status Examination: A New Instrument for Assessing Outcome in Traumatic Brain Injury", Journal of Neurotrauma, 02/2001](#)
- 13

< 1% match (Internet from 24-Dec-2012)

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1064998/>