



## A RETROSPECTIVE DESCRIPTIVE STUDY ON THE EMERGENCY NEUROSURGERIES PERFORMED AT OUR INSTITUTION

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**ABSTRACT** **BACKGROUND:** This study aims to project the burden of the problem of traumatic brain injury managed surgically and its break up among different categories. It also lists out the non-traumatic emergency neurosurgeries done in our institution. **METHODS:** Data of 15 months starting from the December of 2020 were collected and split up into different categories based on age, sex, mode of injury, type of injuries, medico legal cases and non medico legal cases. **RESULTS:** A total of 913 cases were operated during the period of 15 months at an average of 2 cases per day. Of which 601 were medico legal cases 312 were Non medico legal cases. 805 were males, 108 were females. 98 were pediatric cases. 815 were adults. 454 cases were RTA, 90 accidental falls, 52 assaults, 4 work spot injuries, 6 fall from height, 1 bullgore injury. 354 were Acute subdural hematomas, 105 extradural hematomas, 134 depressed skull fractures, 74 chronic subdural hematomas who underwent burr hole tapping, 7 chronic subdural hematomas underwent decompression. **CONCLUSION:** RTA is the commonest mode of injury. Males are common victims. VP shunt is commonly done in pediatric population. The results are comparable with other similar studies. Overall, Traumatic brain injury is a common and huge problem in our society and fully equipped tertiary care centre such as ours is needed to provide emergency neurosurgical intervention in such huge volume areas.

**KEYWORDS :** Fracture, Hematoma, RTA, Subdural, Trauma, VP shunt

### INTRODUCTION

Madurai is a busy city located in the south of Tamilnadu, India. 17,98,834 people are residing at this city as of 2022 within an area of 148 Km<sup>2</sup>. Government Rajaji Hospital attached with Madurai Medical College is located at the heart of the city and it has been the tertiary referral centre for many of the districts down south in the state. Neuro emergency cases form the bulk of operated cases in this ever evolving field. With advent of high speed transportation technologies and increase in the number of people consuming alcohol, traumatic brain injury poses a significant challenge with increase in the number of patients presenting to the casualty. In India more than 1 lakh lives are lost every year with 1 million suffering from serious head injuries. This study aims to project the burden of the problem of traumatic brain injury managed surgically and its break up among different categories. It also lists out the non traumatic emergency neurosurgeries done in our institution.

### MATERIALS AND METHODS:

Data were collected from the emergency neuro trauma and non trauma registries maintained in our institution. Data of 15 months starting from the December of 2020 were collected and split up into different categories based on age, sex, mode of injury, type of injuries, medico legal cases and non medico legal cases.

Patients admitted in head injury ICU and ward through casualty who needed emergency surgical intervention were included in the study. Other non traumatic patients requiring emergency surgical intervention were also included in the study. All trauma related cases were medico legal cases and non traumatic cases were non medico legal cases.

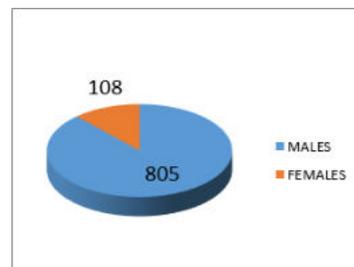
Based on sex patients were classified in to male and female categories. No trans gender case were included in the study. Patients of all age groups were taken up for the study. Based on age patients were divided into groups of 0-12 years 12-20 years, 20-40 yrs, 40-60 yrs, above 60 years. Based on mode of injury patients were categorized in to RTA, Accidental fall, Fall from height, Assault, Work spot injuries, bull gore injuries. Based on indication for surgery patients were categorized as Epidural hematomas (EDH) Acute subdural hematoma (ASDH), Chronic subdural hematoma (CSDH) cases who underwent decompression and burr hole tapping. Depressed fractures of skull, Intracranial hemorrhages (ICH) intraparenchymal contusions, External ventricular drain insertion for various reasons, Bone flap removal in cases of raised ICT in postoperative cases, bone flap removal in cases bone infection or subdural emyema, or abscess, VP shunt insertion for various reasons, excision of tumors that developed midline shift and clinical deterioration of patient, cerebro vascular accident patients involving infarcts and hemorrhages who needed

decompressive craniectomies, intra cranial abscess, subdural hygromas, cases of ruptured spinal meningomyelocoeles, lumbar drain placement and wound debridements. Emergency tracheostomies done were not included in the study. All Traumatic brain and calvarial injuries which were managed conservatively were excluded from the study.

### RESULTS:

A total of 913 cases were operated during the period of 15 months at an average of 5 cases per day. Of which 601 (65%) were medico legal cases 312 (34%) were Non medico legal cases. 805 (88.2%) were males, 108 (11.8%) were females. 98 (10.7%) were pediatric cases with 75 male children and 23 female children. 815 (89.3%) were adults. In the age group of 12 to 20 years 102 were males and 3 were females. In the age group of 20 to 40 years 277 were males and 16 were females. In the age group of 40 – 60 years 228 were males and 49 were females. Greater than 60 year's age group comprised of 123 males and 17 females. 454 cases were RTA, 90 accidental falls, 52 assaults, 4 work spot injuries, 6 fall from height, 1 bullgore injury. 354 (38.7%) were Acute subdural hematomas, 105 (11.5%) extradural hematomas, 134 (14.6%) depressed skull fractures, 74 (8.1%) chronic subdural hematomas who underwent burr hole tapping, 7 chronic subdural hematomas underwent decompression. 22 Extra ventricular dains, 115 (12.6%) VP shunts, 34 (3.7.5%) VP shunt dysfunctions, 12 (1.3%) intracranial abscess drainage, 7 cerebral infarcts which were decompressed, 15 intra cranial hemorrhages, 3 subdural empyemas, 2 ruptured myelomeningocoeles, 1 lumbar drain placement, 5 brain tumours with mass effect which were decompressed, 2 CVT, 3 subdural hygroma, 4 wound debridements, 14 bone flap removal for various reasons.

**Chart: 1 Distribution of cases based on sex**



**Table 2: Case categorization based on age**

Age group in years	Male	Female
0-12	75	23

12-20	102	3
20-40	277	16
40-60	228	49
>60	123	17
	805	108

Chart 2: Case distribution based on age group.

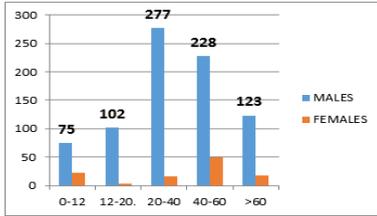


Table 3: Case categorisation based on legal aspect

MEDICOLEGAL CASES	NON MEDICO LEGAL CASES	TOTAL
601	312	913

Chart:3 Distribution of cases based on legal aspect

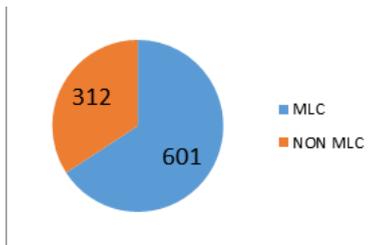


Table 4:Case categorisation based on mode of injury in taumatic brain/calvarial injury.

SNO	MODE OF INJURY	NO.OF PATIENTS
1	RTA	454
2	Accidental Fall	90
3	Assault	52
4	Fall from Height	6
5	Work spot injury	4
6	Bull gore injury	1

Chart 4:Distribution of cases based on mode of injury in traumatic brain/calvarial injury

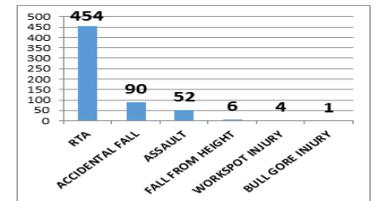
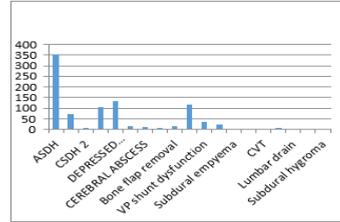


Table 5:Case categorisation based on indication for surgery

SNO	MODE OF INJURY	NO.OF PATIENTS
1	ASDH	354
2	EDH	105
3	Depressed Skull fractures	134
4	CSDH-burr hole tapping	74
5	CSDH-Decompressive craniectomy	7
6	ICH(CVA/trauma)	15
7	Cerebral abscess	12
8	CVA-infarct	7
9	Bone flap removal	14
10	VP SHUNT	115
11	VP SHUNT DYSFUNCTION	34
12	EVD	22
13	Sub dural empyema	3
14	Ruptured myelomeningocele	2

15	Cortical venous thrombosis	2
16	Brain tumors with mass effect	5
17	Lumbar drain placement	1
18	Wound debrdiment	4
19	Subdural hygroma	3

Chart 5:Case distribution based on indication for surgery



**DISCUSSION:**

Following inferences were made from the data analysis. RTA formed the major reason of the head injury cases. Also it was common among males (A.W Tarkrie et al observed similar finding in their study.<sup>1</sup>) in the age group of 20 to 40 years.

S.Arora et al observe major of cases in their study were between 20 to 30 years of age<sup>2</sup>. The data is comparable with our study. Young adult age group RTA was common in patient who were drunken.

People who were elder than 60 years of age were mostly pedestrians who were hit by a vehicle.Majority of females were victims in the age group of 40 to 60 years. Polytrauma was common in RTA whereas accidental falls were mostly isolated head injuries.Subdural hematoma were common in the case operated. . S.Arora et al observed that the commonest type of intra cranial hemorrhage seen in the study was subdural hemorrhage (SDH) whether taken in isolation or in combination (64.01%)<sup>2</sup> Many cases were combined with sub arachnoid hemorrhages and parenchymal contusions constituting burst lobes.Depressed fractures comprised injuries of frontal bone,temporal bones,parietal bones.

Similar to our study it was observed by H.W.Avinash that temporal bone fractures were common<sup>3</sup> Occipital bone fractures which were operated were rare.Among the chronic SDH cases many of them were recorded as non medico legal cases since a clear history of fall and head injury could not be established. T.Cathrine et al quoted “Male sex, road traffic accidents, severe injury (low Glasgow coma score) and CT characteristics such as midline shift and compressed/absent basal characters were significantly associated with an increased probability of emergency neurosurgery, while older age was associated with a decreased probability” in their article. A similar inference was made in our study Re exploration among all forms of surgery was very limited. In VP shunt cases first time shunt surgeries were performed in right side in major cases. No ventriculo atrial or lumbo peritoneal shunts were done. VP shunt dysfunction cases included cases in which there was failure of the pump, disconnected catheter and shunt tubes, abdominal wound CSF leak and purulent fluid leak, extrusion of the tube through anus or abdomen or through neck, meningitis warranting removal of shunt, removal and revision in same sitting, or revision at a later date. In all cases medium pressure shunts were used. EVD was done in cases with traumatic IVH,post aneurysmal bleed IVH,CVA with capsuloganglionic bleed and IVH or hydrocephalus. Right Kocher's point was chosen for almost all EVD cases. There was only one case of bull gore injury in which there was left temporal bone and skull base fracture with laceration of parenchyma and neck injury. The list of non-traumatic cases operated were fitting in the list of cases listed out by DK.Kulkarni et al.<sup>10</sup>

**CONCLUSION:**

RTA is the commonest mode of injury.Males are common victims.VP shunt is commonly done in pediatric population. ASDH is the commonest indication for surgery The results are comparable with other similar studies.Overall ,Traumatic brain injury is a common and huge problem in our society and fully equipped tertiary care centre such as ours is needed to provide emergency neurosurgical intervention in such huge volume areas. Further studies are needed to analyse about the equipment,infrastructures,the post operative care , man power available and outcome of cases in such high volume centers.

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