



EPIDEMIOLOGY AND MANAGEMENT OF TRAUMATIC BRAIN INJURIES BY GENERAL SURGEONS AT PJMCH DUMKA, JHARKHAND.

Surgery

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ABSTRACT

Background: Head injury and Traumatic brain injury is a common cause of surgical emergency and admission at PJMCH Dumka, Jharkhand. As no neurosurgeon available, most of the cases are managed by the general surgeons in the institute. The aim of this study, is to study the epidemiology, incidence and pattern of head injury and their prognosis and outcome in a setting of a general hospital where they were managed by general surgeons.

Methods: This is a prospective analytical study of head injury patients. The study defines the mechanism, patterns of head injury, their management by general surgeons and the outcome in surgery ward, PJMCH Dumka, Jharkhand for one year (August 2020-July 2021).

Results: Head injury comprised 20% (1080) of total admissions (5400) in the surgery ward. Out of those, 56.9% (615) were mild, 28.7% (310) moderate and 14.3% (155) severe head injury cases, based on Glasgow coma scale and CT findings. Majority of cases (67%) were young adults between 21-60 years. 82% of cases were male and 18% were female. 19.4% (210) cases were associated with skull fractures. Most of the cases ie; 47% of cases were referred to neurosurgical centre for further management; about 40% of cases were managed conservatively in the ward, 3% of cases died and 10 % left against medical advice(LAMA).

Conclusion: Almost half of the cases admitted were managed by general surgeon in the hospital provided basic facilities, Intensive care and a dedicated team available.

KEYWORDS

Glasgow Coma Scale; Head injury; Traumatic brain injury

BACKGROUND:

Head injury is a common surgical emergency which causes increased morbidity and mortality globally^[1]. It can be a result from Road Traffic Accident (RTA), fall from height injury, physical assault etc. It is a cause of major disability and mass financial and psychological burden in Indian society^[2]. It can be clinically a spectrum ranging from mild contusion to neurological deficit including Diffuse Axonal Injury and death. Head injury is one of the common causes of surgical admission in ER dept. at PJMCH Dumka, India. The purpose of this study is to study the epidemiology, incidence and pattern of head injury, and their outcome in PJMCH Dumka and to emphasise the role of general surgeons in PJMCH Dumka, Jharkhand where there is a high prevalence of traumatic head injury, and also no neurosurgeon available here. Most of the cases have been conservatively managed effectively by proper imaging facilities, trained general surgeons and trained nursing staffs.

MATERIAL AND METHODS:

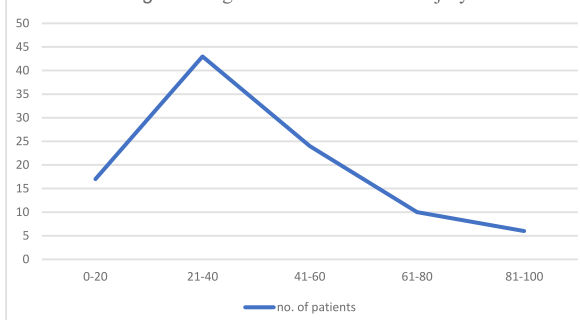
This prospective analytical study was conducted during the period of August 2020- July 2021 in PJMCH Dumka, in all the admitted cases of head injury (n= 1080) in the surgical ward. After an initial examination and resuscitation in the ER, patients were categorized according to the Glasgow Coma Scale (GCS) into *mild*, *moderate* and *severe* head injury. A routine Xray of the skull and routine investigation of blood was performed in all cases and an NCCT scan of brain and skull was ordered in cases that deteriorated during observation or those who presented with a severe head injury.

Patients were then managed according to the findings as guided by their clinical assessment, NCCT findings. Patients with mild head injury and without any features of raised Intracranial Pressure (ICP) or any further deterioration during their stay in ER were discharged within the couple of days, whereas those showing any features of raised ICP, deterioration in their GCS and mild grade of CT finding; also those coming from very distant area were admitted for observation. All cases of moderate and severe head injury were admitted. Decision to keep further or to refer was taken on the basis of patient's clinical condition and CT findings. Data were collected and analyzed in the form of age and sex distribution, mode of injury, severity and outcome of the patient.

RESULT:

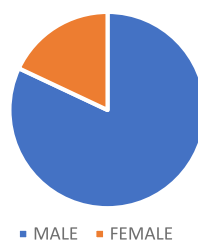
Head injury comprised of 20% (1080) of total admissions (5400) in surgery ward during the period of this study. Their age ranged from 1-86 years with a mean age of 31 years. Majority of the patients were young adults between 18-45 years of age (Figure 1).

Figure 1. Age distribution of Head injury.

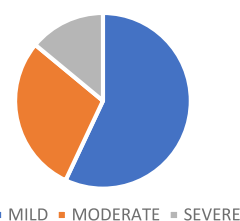


82% (885) of cases were male and 18% (194) were female. Out of these, 56.9% (625) had mild, 28.7% (310) moderate and 14.3% (655) severe head injury based on GCS.

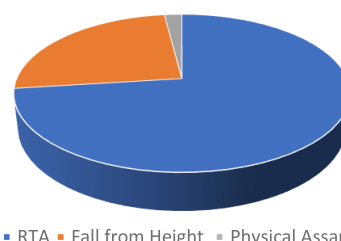
Pie Chart showing Gender distribution of Head injury



Pie Chart showing incidence of Mild, Moderate and Severe grades of head injury.



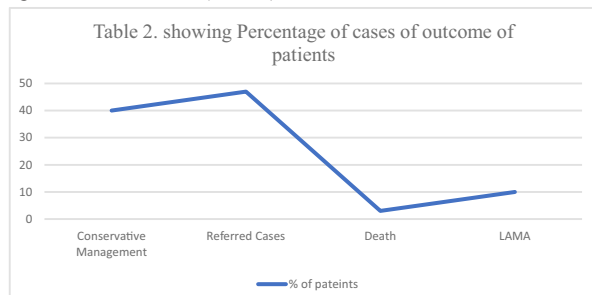
Pie Chart showing various mode of Traumatic brain injury.



Fall from height (25%) and RTA (73%) were the leading causes of head

injury, along with 2% cases due to physical assault, at this region. X-ray skull was done in all cases and showed fracture only in 75 cases (7%). CT head was done in 885 cases (82%). Most of these cases were moderate and severe head injuries. Contusion (47 %) followed by EDH (39%) and SAH (14%) were the commonest lesions along with fracture of facial bone, cranium and skull base (Pie Chart).

Most of the cases were treated conservatively in 432 patients (40 %) and 507 patients (47%) were referred to higher centers; 32 patients (3%) died during the course of treatment & 108 (10%) cases left against medical advice (Table 2).



DISCUSSION:

Most of the cases (67 %) in our study were young adults from 21-40 years. Also, the incidence was found higher in males (82%) than in females (18%). Most common causes of head injury were fall from height (27%) and RTA (73%). RTA with traumatic brain injury is very common in this part of state due to reckless and uncontrolled driving specially in the young adults and also under the influence of alcohol. There were 56.9% of mild head injury, 28.7% of moderate and 14.3% of severe head injury in this study. In literatures all around, mild head injury (60-90%) comprises the majority of all head injuries whereas moderate (10-30%) and severe head injuries (5-15%) are minimal.

In our case we had a NCCT scan service being availed by the private sector which was used in the required cases if afforded by patients. X-ray of the Skull was done routinely, it showed fracture in 75 cases only. Neurosurgery is currently not available in the city Dumka and adjacent districts, hence referral to the higher centre is the key to save lives in cases of TBI. But, mild head injuries can be managed by general surgeons with a good outcome. In such condition the burden of treatment of neuro-trauma has to be taken by the general surgeons and the results are quite good. In our study, there was only 3 % mortality and 47% referral. Most of the cases showed good recovery at discharge. Management of the traumatic brain injury in a non neurological referral centre is basically designed to prevent secondary brain injury and also to provide the neurosurgeon with a live patient with some hope of recovery. Current therapeutic approaches aim to reduce mortality and improve patient outcome, which the associated disability has significant functional, social and economic sequel. The mechanical deformation of the brain that occurs at the moment of impact in severe head injury leads to both focal injury (contusions and cortical lacerations) and diffuse axonal injury, both of which are described as the "primary brain injury". Brain damage does not cease with the impact but progresses over subsequent hours and days ("secondary brain injury"). Secondary injury may be due to intracranial causes, such as surgical mass lesions, focal or global brain swelling causing elevated intracranial pressure and seizures, and extra cranial causes, such as hypotension, hypoxia, hypercarbia, hypoglycemia, anemia, pyrexia, dyselektrolytenemia, coagulopathies and infection like meningitis^[3]. On a cellular level, these insults lead to amino acid toxicity, free radical damage, lipid peroxidation, calcium-mediated damage, inflammation, ischemia and neuronal death^[4]. There is currently no treatment for primary brain injury, so the mainstay of management of moderate or severely head injured patients is the prevention and treatment of secondary brain damage.^[5]

CONCLUSION:

RTA and Fall from height were the main cause of head injury in this study. Young adults and males were the common ones affected. About 57% cases were mild head injury managed successfully in the hospital. 47% were referred to neurosurgical centre for urgent craniotomy. Most of the cases showed good recovery at discharge. There was only 3% mortality. This study showed that in absence of a neurosurgeon, General surgeons can manage most of the cases of mild to moderate head injury with a good outcome.

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