

# **PATTERN, OUTCOME AND OF MANAGEMENT OF HEAD INJURY BY GENERAL SURGEONS AT THE ACCIDENT AND EMERGENCY DEPARTMENT OF THE NIGER DELTA UNIVERSITY TEACHING HOSPITAL (NDUTH) OKOLOBIRI, BAYELSA STATE OF NIGERIA.**

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Head injury is one of the common causes of surgical admission in the Accident and Emergency Unit of the Niger Delta University Teaching Hospital, Okolobiri. With no neurosurgeons available, most of the cases are managed effectively by adequately trained general surgeons.

The aim of the study is to study the pattern of head injury and their management outcome in a setting where they were managed by general surgeons.

This is a prospective analytical study of 54 head injury patients. The study defines the patterns of head injury, their management by general surgeons and outcome in Accident and emergency department of the Niger Delta University Teaching Hospital (NDUTH) Okolobiri, Bayelsa State of Nigeria over a two year period (January 1, 2012 to December 31, 2013).

Fifty-four cases were studied. Out of which, 66.7% (36) were mild, 11.1% (6) moderate and 22.2% (12) severe head injury cases, based on Glasgow coma scale. Majority of cases 25 (46.3%) were young adults between 21-30 years. Males accounted for 37(68.5%) and females 17(31.5%) of cases. 18.5% (10) cases were associated with skull fractures. Most of the cases showed good recovery. Referred cases were 6 (11.1%), 4 (7.4%) died and 2 (3.7%) left against medical advice.

Most of the head injury cases encountered can be managed initially by general surgeons in our setting with basic facilities like a high dependency unit and a dedicated team. A trauma center needs to be established in this facility to provide prompt and quality care to head injured patients.

**Keywords:** Glasgow Coma Scale; head injury; pattern, outcome

## **INTRODUCTION**

Head injury is considered as a major health problem that is a frequent cause of death and disability and places considerable demands on health service providers. In developing countries accident rates in general and traumatic brain injury in particular are increasing as traffic increases besides other factors like industrialization, falls and ballistic trauma. Head Injury has been defined by Vij K as, "a morbid state, resulting from gross or subtle structural changes in the scalp, skull, and/or the contents of skull, produced by mechanical forces"<sup>1</sup>. It has also been defined as physical damage to the scalp, skull or brain produced by an external force by Irgibrigtsen T et al<sup>2</sup>. However, such force/impact, responsible for the injury needs not be applied directly to the head. Reddy KSN stated that "Depending upon whether or not the duration matter was torn, head injury may be termed as open or close type"<sup>3</sup>. The extent and degree of injury to the skull and its contents is not necessarily proportional to the quantum of force applied to the head. According to Munro<sup>4</sup> "any type of cranio-cerebral injury can be caused by any kind of blow on any sort of head". Currently, the term traumatic brain injury (TBI) is used more commonly in place of "head injury" so as to differentiate it from head injury due to non-traumatic causes Jennett B reported that traumatic injuries are very common causes of morbidity and mortality<sup>5</sup>. They are so common that they were found to be the commonest cause of death in persons under the age of 45 years in western

## 2. Palgo J.Med.Medical.Sci

countries by Patel HC et al and Ghajar J<sup>6,7</sup>. Head injuries account for up to half of all deaths due to trauma and for most of the permanent disabilities after injury<sup>5</sup>. It has serious detrimental effects on the lives of patients, their families, friends and society<sup>5,6</sup>. The Lancet Neurology estimated that 10 million persons worldwide are affected every year by a new traumatic event resulting in head injury irrespective of cause.

NDUTH is an emerging trauma center due to its location close to the main trunk line linking the oil-rich cities of Port Harcourt and Warri. It is a 160-bed referral hospital that is for victims of motor vehicle trauma. Currently, there is no neurosurgeon present and neurosurgical services are not fully available. Most of the cases have been managed quite effectively with few referrals and few deaths by adequately trained general surgeons in neurosurgery, anesthetists and nursing staff.

The aim of the study is to study the pattern of head injuries and their outcome in order to document of experience.

### PATIENTS AND METHODS

This prospective analytical study was conducted over a two year period (January 1, 2012 to December 31, 2013) of cases diagnosed with head injuries and managed in the Accident and emergency department of the Niger Delta University Teaching Hospital (NDUTH) Okolobiri, Bayelsa State of Nigeria.

The data was collected retrospectively from the records of the accident and emergency unit. Cases were strictly limited to the A and E unit and does not include the outcomes following the patients exit from the said unit. The patients chosen were those that had head injury of any severity included in the diagnosis irrespective of the cause. Patients were then managed according to the findings as guided by their clinical assessment,

The data collected included the age, sex, severity and outcomes of the individual patients while admitted to the A and E unit. The severity of the head injury was assessed at the time of presentation and split into three groups using the Glasgow Coma Scale (GCS) Table 1, classification of head injury. This objective scale assesses three parameters of patients' response to access the levels of consciousness of the patients. The outcomes were those made at the casualty unit and did not include any follow-up data.

### RESULTS

Fifty-four patients were studied during a two year period comprising of 37 (68.5%) males and 17(31.5%) females giving a male to female ratio of 2.3:1. The presentation of the patients varied from bruises, lacerations, unconscious and comatose.

Majority of the patients were young adults between the age group 21 to 30 years; (N = 25; 46.3%), Figure 1. Most of the cases were treated conservatively and those that assessed to need surgery were urgently transferred to University of Port Harcourt. Teaching Hospital, Port Harcourt. Figure 2 shows the numbers of attendance at the emergency department, NDUTH, Okolobiri from Jan 1, 2012 to Dec 31, 2013.

Most of cases 36(66.7%) had mild Traumatic brain injury severity as shown in Table 3. Road traffic accidents were the leading cause of injury and accounted for 37 (66 %) of head injuries (Table 4) while Table 5 shows the pattern of skull injuries seen.

Thirty-one patients (57.4%) (Table 6) were discharged home from the A&E following varied periods of observation. Six (11.1%) of the patients were transferred to other health facilities for further management. There were four mortalities (7.4%), all had severe head injuries and died within 24 hours of presentation.

### DISCUSSION

Head injuries constitute a major part of the work of our newly established and developing emerging trauma center. The GCS is of value not only as an objective and reproducible means of quantifying the degree of neurological impairment, but also as a basis for making early, accurate predictions of the likely outcome of head-injured patients<sup>1,6</sup>. Various authors (Patel HC et al, NICE Clinical Guideline, Faul M et al, Teasdale G & Jennett B., and Jennett B, & Bond M,) reported that males are more affected with head injury as in most areas of the world<sup>6,9-12</sup>. Our findings are similar as the males predominate in this study also. The male to female ratio is 2.3:1 in this study as against 3:1 at University of Nigeria Teaching Hospital, Enugu<sup>9</sup> and 1.4:1 at the United States of America<sup>6</sup>. Also noted is the discrepancy between the peak age incidence of 21 – 30 years of this study and that of New Zealand and the USA with the bi-modal peaks of 0 – 4 and >65 years<sup>6,12</sup>.

Road traffic accidents remain the commonest cause of TBIs as reported by multiples authors findings<sup>11,1-15</sup>. As the results obtained show, it is also the commonest cause of these injuries accounting for 66% of all cases seen. This is contrary to the figures obtained in the USA by Patel HC et al<sup>6</sup>, Australia (Jennet B and Bond M)<sup>12</sup> and New Zealand (Valery L et al)<sup>16</sup> where falls are the commonest cause of emergency department visits.

Contrary to popularly held belief, the number of head injured patients did not rise with the “ember” months. The number was noticeably higher in the rainy season (Fig. 2) and may be attributable to defects in the mode of transportation and

the decreased visibility brought about by rains as well as poor decision making on the part of the driver.

A mortality rate of 7.4% was obtained over the course of the study. This figure represents only those who died at the hospital and is not inclusive of those brought in without signs of life as they are usually taken directly to the mortuary. Multiple reports including those of Silas OA et al (Nigeria), Udoh DO and Adeyemo AA (Nigeria), Tate RL et al (Australia) . Yattoo GH and Tabish A (Kashmir) are of the view that “Therapeutic inadequacies are known to result in increased morbidity and mortality<sup>17-20</sup>”. In the present study, highest number of patients had scalp lacerations, 20 (37.1%) cases and others were abrasions 18 (33.3%), fractures 10 (18.5%) and punctures 6 (11.1%) Table 5. Management of head injury requires sound judgment and awareness of a possibility of injury to other systems which may complicate the problems. Though a CT scan is the first line investigation to detect immediately life threatening lesions and MRI is the examination of choice for full assessment of brain lesions<sup>8</sup>. These investigative modalities are rarely available all in a developing country like Nigeria<sup>21</sup>. In our case we don't have any CT scan services during the period of study. X-rays of the skull were taken routinely. However X-rays cannot demonstrate the routine intracranial injury (Ghimire P et al)<sup>21</sup>. In spite of best management, 15–20% of head injuries are known to prove fatal<sup>20</sup>. All our patients had conservative management and 6 (11.1%) cases based on GCS severity and possible need of surgical intervention were referred early to centers with Neuro-Surgical services, (Table 6). The patients seen and referred to other health facilities were those with severe head injuries with an initial GCS score of less than 5 that had been stabilized.

Management of the traumatic brain injury in our non-neurological referral center is basically designed to prevent secondary brain injury and also to provide the neurosurgeon with a live patient who has some hope of recovery at referral<sup>21</sup>. Current therapeutic approaches aim to reduce mortality and improve patient outcome, of 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, hyper/hypocarbica, hyper/hypoglycemia, anemia, pyrexia, electrolyte abnormalities, coagulopathies and infection. On a cellular level these insults lead to amino acid excite-toxicity, free radical damage, lipid peroxidation, calcium-mediated damage, neuron-inflammation, ischemia and neuronal death. There is currently no treatment for primary brain injury, so the mainstay of management of moderate or severely head injured patients rests on the prevention and treatment of secondary brain damage<sup>21</sup>

## CONCLUSION

Most of our cases (66.7%) were mild head injury managed successfully during the critical stages in the Accident and Emergency Unit of this hospital and 11.1% were referred. Most of the cases showed good recovery at discharge or transfer to the ward. There was 7.4% mortality. This suggests that in absence of a neurosurgeon, general surgeons who are adequately trained in neuro-trauma can manage most of the cases with favorable results.

Appropriate medical care facilities (including trauma centers) need to be established in this our fast developing area to provide prompt and quality care to head injury patients as this facility is a major referral centre to cater to ever-increasing number of such patients.

**Table 1.** The Glasgow Coma Scale<sup>7</sup>

Eye opening	Best verbal response	Best Motor response
Spontaneous 4	Oriented 5	Obeys command 6
To voice 3	Confused 4	Localizes pain 5
To pain 2	Inappropriate 3	Withdraws from pain 4
No response 1	Incomprehensible 2	Abnormal flexion to pain 3
	No response 1	Abnormal extension to pain 2
		No response 1

**Table 2.** Classification of severity of head injury

Severity of head injury	GCS score
Mild	13 – 15
Moderate	9 – 12
Severe	3 – 8

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##### Age distribution

The peak incidence was found in the age group 21 to 30 years; (N = 25; 46.3%).

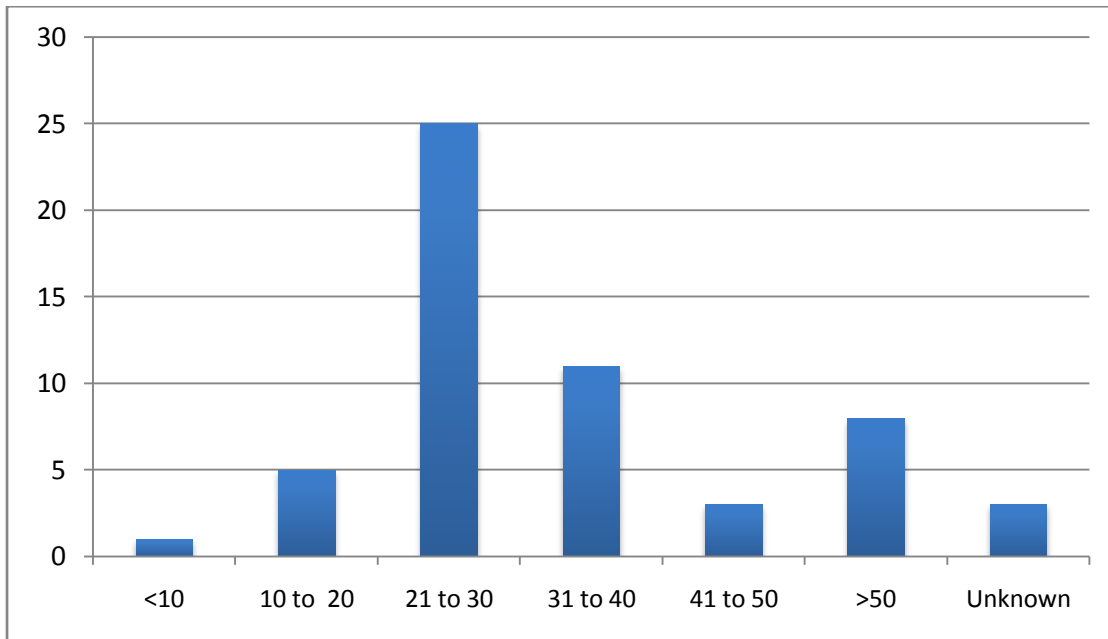


Figure 3. Age distribution of patients with head injuries attended to at NDUTH, Okolobiri from Jan 1, 2012 to Dec 31, 2013.

##### Attendance by month

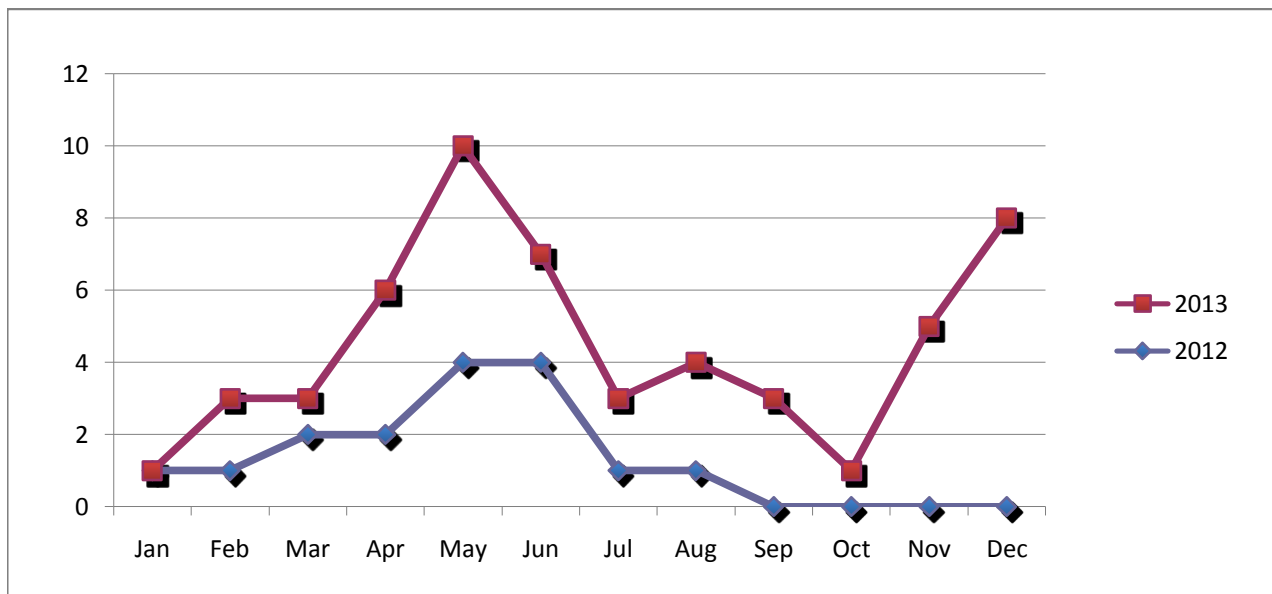


Figure 4. Attendance at the emergency department, NDUTH, Okolobiri from Jan 1, 2012 to Dec 31, 2013.

Table 3. Traumatic brain injury by severity

Severity using GCS	Frequency (%)
Mild	36(66.7)
Moderate	6(11.1)
Severe	12(22.2)

**Table 4** Traumatic brain injury by mechanism of injury

Aetiology	Frequency	Percentage
Road traffic accidents	37	66
Violence/Assault	6	10.7
Pedestrian accidents	3	5.4
Gun shot	2	3.6
Falls	2	3.6
Others	6	10.7

**Table 5.** Traumatic brain injury by pattern of injury at presentation

Pattern	Frequency	Percentage
Lacerations	20	37.1
Abrasions	18	33.3
Fractures	10	18.5
Punctures	6	11.1

**Table 6.** Traumatic brain injury by outcome at the end of stay at the Accident and emergency unit

Outcome	Frequency(%)
Discharged	31(57.4)
Transfer to ward	11(20.4)
Referred to other health facilities	6(11.1)
Discharged against medical advice	2(3.7)
Death	4(7.4)

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