



## Pattern of Head Injury in the Emergency Department of the Delta State University Teaching Hospital, Oghara, Nigeria

A. A. Bock-Oruma<sup>1\*</sup>, D. O. Odatuwa-Omagbemi<sup>2</sup> and J. E. Ikubor<sup>3</sup>

<sup>1</sup>Department of Accident and Emergency, Delta State University Teaching Hospital, Oghara, Delta State, Nigeria.

<sup>2</sup>Department of Surgery, Delta State University, P.M.B. 1, Abraka, Nigeria.

<sup>3</sup>Department of Radiology, Delta State University, P.M.B. 1, Abraka, Nigeria.

### Authors' contributions

*This work was carried out in collaboration between all authors. Author AABO designed the study, wrote the protocol and wrote the first draft of the manuscript. Authors DOOO and JEI managed the literature searches. All authors read and approved the final manuscript.*

### Article Information

DOI: 10.9734/BJMMR/2016/25409

#### Editor(s):

(1) Patorn Piroonchai, Department of Otorhinolaryngology, KhonKaen University, Thailand.

#### Reviewers:

(1) Raouf M. Afifi, International Management-Health Services Institute, Indianapolis, IN, USA.

(2) Nikolaos Tzerakis, University Hospital of North Midlands, Greece.

Complete Peer review History: <http://sciencedomain.org/review-history/14311>

Original Research Article

Received 4<sup>th</sup> March 2016

Accepted 8<sup>th</sup> April 2016

Published 25<sup>th</sup> April 2016

### ABSTRACT

**Background:** Head injury (HI) is a common condition presenting to Emergency Departments (EDs), accounting for a significant proportion of morbidity and mortality of the productive age of the world's population.

**Aim:** This study aims to highlight head injured patients' epidemiological pattern as seen in the Emergency Department of the Delta State University Teaching Hospital (DELSUTH), Oghara, Nigeria.

**Methodology:** This was a prospective study of all consecutive head injured adult patients seen in the ED of DELSUTH from January to December, 2014. The variables assessed included age, gender, aetiology, severity of injury and mortality. Glasgow Coma Scale (GCS) was used to assess the severity of head injury.

**Results:** Eighty-eight head injured patients were seen in the ED in the period under review. The

\*Corresponding author: E-mail: [bockoruma@yahoo.com](mailto:bockoruma@yahoo.com);

mean age was  $32.80 \pm 12.50$  years. Age range was 17-85 years. The most affected persons were from 25-34 years of age (31.8%). The male: Female ratio was 9 to 1. On aetiology, 4.4% of the patients had a fall, 13.6% were assaults and 81.9% had Road Traffic Accident (RTA). In terms of severity of injury, 49 (55.7%) of the patients had mild HI, 20.4% had moderate head injury and 23.8% had severe HI. RTA was the sole aetiology of head trauma for those 45 years and above (22.7%). Six (6.8%) of the patients died while receiving treatment at the ED before transfer for further specialised care.

**Conclusion:** Head injury is a major contributor to trauma admissions in the ED. The economically most productive age groups and the male sex are mostly affected. RTA is still a major cause of head injury in our society. There is therefore the need for the education of road users on road safety measures and for the government to improve on the state of the roads. Increased funding for pre-hospital and specialist neurosurgical facilities and personnel will also ensure that head injured patients get the best care possible.

*Keywords: Head injury; emergency department; glasgow coma score; road traffic accident; epidemiology.*

## 1. INTRODUCTION

Head injury is a common condition presenting to Accident and Emergency departments, accounting for a significant proportion of morbidity and mortality of the productive age of the world's population [1,2]. Head injury can be defined as a history of significant trauma to the head with resultant scalp wound or evidence of altered consciousness [2]. The incidence and epidemiological causes of head injury vary widely in different regions of the world due to social, economic, cultural consequences, awareness of traffic regulations and substance abuse [3]. In western Nigeria, a study [4] reported an incidence of 2710 head injuries per 100000 population. Incidences of 394 per 100000 and 453 per 100000 have been reported in the United States and the United Kingdom respectively [5]. Sex prevalence has shown that males are more likely to be affected in comparison to the females, globally [4-6]. Head injury is a major cause of trauma deaths and disabilities as well as a huge consumer of available health care resources [1,6]. It also has both short and long term economic impact on patient's life, his family and the society at large [6]. The burden of head injury is succinctly captured by the World Health Organization (WHO) global burden of injury. It ranked head injury among the top ten leading causes of death, with an estimated 5 million deaths annually and Africa men have the highest injury-related mortality rates in the world. Among African nations the rate of injury mortality in 2004 was the highest in Nigeria and the lowest in Egypt, South Africa and Ethiopia were second and third, respectively [7]. This is more worrisome where there is a dearth of emergency physicians and

good prehospital care of trauma victims. This study aims to highlight head injured patients' epidemiological patterns as seen in the Emergency Department of the Delta State University Teaching Hospital (DELSUTH), Oghara, a tertiary hospital in the Niger Delta region of Nigeria. In addition, it will also lead to an understanding of the burden of head injury and help concerned bodies to take appropriate action in ameliorating the condition.

## 2. PATIENTS AND METHODS

This was a prospective study of all consecutive head injured adult patients seen in the ED of DELSUTH from January to December, 2014. Ethical clearance was obtained from the Health Research Ethics Committee of DELSUTH, Oghara. A pro forma for assessing head injured patients in the ED was used in collating information from the patients by the emergency physician. Data was collected on the age, gender, aetiology, severity of injury. Glasgow Coma Scale (GCS) was used to assess the severity of head injury. The level of consciousness as assessed by the Glasgow Coma Scale was used to categorise the severity of a head injury into mild (GCS, 13-15), moderate (GCS, 9-12) and severe (GCS,  $\leq 8$ ) [2]. Patients dead on arrival in the ED were excluded from the study.

### 2.1 Analysis Plan

The data were entered into SPSS 16. Analysis was also done using the statistical software. Results were presented as tables, charts and proportions.

### 3. RESULTS

One thousand, three hundred and twenty-four patients were seen in the ED in the period under review. Three hundred and fifty-three (26.4%) were trauma cases. Of these trauma cases, eighty-eight (24.9%) were head injured patients. This gave head injury an incidence of 6.6% of all ED admissions and 25% of trauma admissions to the ED in the period under review. The mean age was 32.80±12.50 years. Age range was 68.00 years (17-85). There were six mortalities giving a mortality rate of 6.8%.

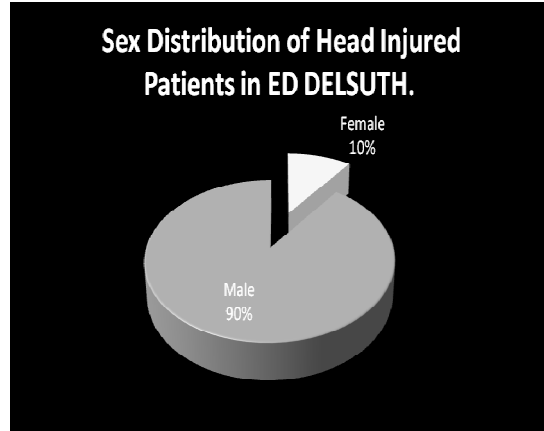
**Table 1. Age distribution of head injured patients**

Age group (yrs)	Frequency	Percent
15-24	18	20.5
25-34	28	31.8
35-44	22	25.0
45-54	9	10.2
55-64	4	4.5
≥65	7	8.0
Total	88	100.0

Majority of the patients affected were those in the 25 to 34 years age group (31.8%). The least affected group of patients is those in the 55-64 years age group with 4.5% (see Table 1).

Most of the patients, 79 (89.8%) were males, with about 10% being females. This gave a male: female ratio of 9 to 1 (see Fig. 1).

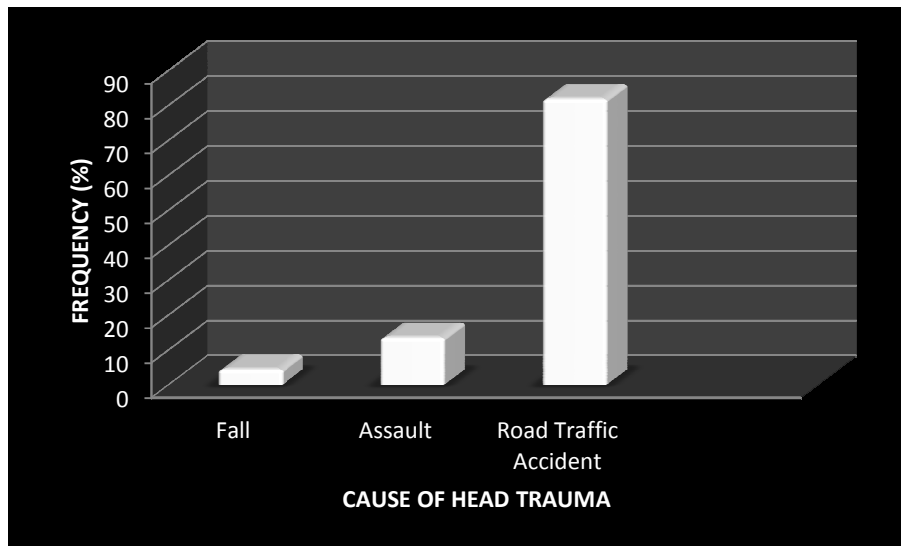
Road traffic accident accounted for the most cause of head trauma with 81.9% and fall contributed just 4.5% as shown in Fig. 2.



**Fig. 1. Chart showing the sex distribution of head injured patients in ED of DELSUTH**

An association of the age group of the patients with cause of head injury showed that RTA is the sole cause of head injury in the patients 45 years old and above (22.7%) as shown in Table 2.

Mild head injury occurred most with 55.7% and moderate head trauma was least with 20.4%. It is also important to note that two-third of the elderly with head injury had severe head injury, making them the most vulnerable group (as shown in Table 3).



**Fig. 2. Chart showing the causes of head trauma in ED of DELSUTH**

**Table 2. Age distribution and aetiology head of injury**

Age group (yrs)	Fall (%)	Assault (%)	RTA (%)	Total (%)
15-24	0(0)	5 (5.7)	13 (14.8)	18 (20.5)
25-34	2 (2.2)	5 (5.7)	21(23.9)	28 (31.8)
35-44	2(2.2)	2(2.2)	18(20.5)	22(24.9)
45-54	0(0)	0(0)	9(10.3)	9(10.3)
55-64	0(0)	0(0)	4(4.5)	4(4.5)
≥65	0 (0)	0 (0)	7(8.0)	7(8.0)
Total	4(4.4)	12(13.6)	72(81.9)	88(100.0)

**Table 3. Age distribution and severity of head injury**

Age group in years	Mild head injury (%)	Moderate head injury (%)	Severe head injury (%)	Total (%)
15-24	14(15.9)	2(2.2)	2(2.2)	18(20.5)
25-34	9(10.2)	10(11.4)	9(10.2)	28(31.8)
35-44	18(20.5)	3(3.3)	1(1.1)	22(24.9)
45-54	6(6.9)	1(1.1)	2(2.2)	9(10.2)
55-64	0(0)	2(2.2)	2(2.2)	4(4.4)
≥65	2(2.2)	0(0)	5(5.7)	7(8.0)
Total	49(55.7)	18(20.4)	21(23.8)	88(100.0)

#### 4. DISCUSSION

This study highlights the epidemiological properties and trauma patterns of head injured patients in the Emergency Department of the Delta State University Teaching Hospital (DELSUTH), Oghara, Nigeria. This study reports that one –quarter of all trauma cases are head injured, sadly so in an environment where there is poor attitude to road safety regulations and poor use of safety elements. Sadly, the major factors implicated in road traffic accidents –driver factors, vehicle factors and roadway factors-play a huge role in head injury [8,9]. Interestingly, however, the incidence of 6.6% of head injury in the ED from this study is same with the incidence gotten in the United Kingdom, [2] reflecting the global burden of head trauma.

While the mean age of victims with head injury from this study agrees with that of other studies, [4-7,10] the sex prevalence, however, reveals a higher male to female ratio, though reasons for this could not ascertain from this study.

This study revealed that most head injuries in Nigeria are caused by RTAs, as found in other studies, [4-5,7,8,11-13] with over 70% being attributed to RTA. This could be a reflection on the poor road infrastructure in the country as well as that of poor knowledge, attitude and skill of the road users. Notably, this study also showed that RTA is the sole cause of head trauma in the middle- aged and the elderly, though the reason

for this could not be deduced from this study. While fall is the next commoner cause in Nigeria, [5] this study revealed that assault occurred more often than falls. The contribution of assault as a cause of head injury in this study could be a reflection of the state of restiveness in the society as depicted by criminal, cult and other violent acts [8]. Assault as a cause of trauma (or head trauma) could be looked into in further studies. In East Africa, particularly in Ethiopia, assault or interpersonal violence (54.1%) is the commonest cause of head injury followed by road traffic accidents (31.1%) [6]. In the United States however, falls, RTAs and assault accounted for 28%, 20% and 11% of head injury respectively [5,14]. Mild head injury is the commonest presentation of head trauma patients from this study. Other studies also reported the same [5,6,11]. However, while this study was a prospective one as the one conducted in the Indian subcontinent, [11] the studies conducted in the South East of Nigeria and in Ethiopia were retrospective. [5,6] the sample sizes of the studies were small except for the from South East Nigeria. Besides, none of the studies including this one, determined the power of their studies. All the studies used the GCS in assessing injury severity just as this study did [5,6,11].

The mortality rate of head injured patients in this study is low but similar to reports from other studies done in the emergency department [12]. This may not be a true representation of

outcomes of head injured patients, but it does suggest that where validated guidelines are followed in patient care, good outcomes can be expected. In this case, the ATLS protocol is used in the management of trauma victims with the presence of trained personnel.

## 5. STUDY LIMITATIONS

Some weaknesses in this study include the small number of subjects recruited which could make this study underpowered, even though there was no sample size estimation. This study may not reflect the actual severity of injury at the time of trauma as the patients presented at different times after trauma. With this, secondary brain injury may have contributed to the level of consciousness at presentation. Patients dead on arrival at the ED are not captured in the emergency department register and this could undermine the mortality rate reported in this study.

## 6. CONCLUSION

Head injury is a major contributor to trauma admissions in the ED. The productive age group and the male sex are mostly affected. Road traffic accident is still a major cause of head injury in our society. Assault and interpersonal violence are also significant contributors to head injury. There is therefore the need for the education of road users on road safety measures and for the government to improve on the state of the roads.

## CONSENT

It is not applicable.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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