

## A study to determine the prevalence of Traumatic Head Injuries in Zanzibar: Case study of Mnazi Mmoja Hospital

### ABSTRACT

**Introduction:** Worldwide, traumatic head injuries account for a high degree of morbidity and mortality. Road accidents appear to be the commonest cause of these injuries. This study is aimed at assessing the prevalence and predictive factors of Traumatic head injury at a tertiary institution health facility in Zanzibar.

**Method:** A retrospective observational study of head injury patients that are attended at Mnazi Mmoja Hospital, Zanzibar from May 2019 to May 2020

**Results:** A total number of 81 patients were included in the study and distributed as follows; 63 males (77.8%) and 18 females (22.2%) participants. The majority of patients were between the age group of 16-30 years and 40 (49.4%) in total. Road Traffic Accident was the leading cause of injuries (67.9%). Others include assault (13.6%), falling (13.6%), and being struck by an object (4.9%). The study also recorded a higher prevalence of traumatic brain injury TBI (57.9%), including, concussion (9.8%), contusion (18.5%), epidural hematoma (8.6%), skull fracture (14.8%), and subarachnoid hemorrhage (6.2%). This was compared with other causes of head injuries (42.1%) such as cut wounds (9.8%) and soft tissue injuries (32.1%). 64.2% of the patients were treated as outpatients, with 33.3% as inpatients. About 2.5% of the patients died. The west district recorded the highest prevalence of patients with injury rates compared to other districts.

**Conclusion:** Public awareness campaigns and health promotions concerning road safety rules are needed to help reduce the high burden of road traffic accidents. Government should also pay attention to the improvement of roads as a way to curb this menace.

Key word: Traumatic Head Injuries, Public awareness, road safety, Predictive Factors, trauma

## INTRODUCTION

Traumatic brain injury (TBI) is a major public health concern all over the world. It causes a high degree of mortality among young people as well as serious disabilities among those who managed to survive [1]. The cost of management of affected individuals is capable of exerting a serious financial burden as well as loss of manpower on both the governments and individuals. An estimate of 5.3 million and 7.7 million people live with TBI-related disabilities in the USA and European Union respectively. [2]. From available data, it is estimated that TBI causes more than 4.5 million deaths every year giving an approximate ratio of one in every ten deaths worldwide. It is plausible that this number may increase particularly in developing countries due to the high prevalence of TBI. The dangerous consequences of TBI, including cognitive impairments and other sequelae, may categorize it as a silent killer. Injuries associated with the increased use of motor vehicles particularly in middle and low-income countries have led to a rising incidence of TBI. About 60% of brain injuries in the world are due to road traffic accidents. [4]. Falls account for about 25% while non-vehicle-related accidents like violence constitute about 15% of TBI. This had led to a high rate of deaths and hospitalization [5]. The survivors end up acquiring permanent [1][5]. According to the WHO prediction, the TBI will surpass other causes of death including chronic diseases as the leading cause of mortality and disability by the year 2020 [6]. It is expected that the increase will be more pronounced in developing countries where the trend is already evident. A group of researchers analyzed 33415 deaths from TBI in 25 European countries, of which 22886 (68%) were male individuals. Many deaths in the included countries occurred in patients 65 years or older: 7599 (41.6%) of deaths occurred in this age group in female patients, 10 646 (58.4%) in male patients, and accounting for 18 245 deaths in both sexes [7]. In another study conducted at Kenya national Hospital; the study discussed the socioeconomic information of the patients with traumatic head injuries and observed a serious challenge in the determination of epidemiology of TBI in a developing country like Kenya. This is as a result of the lack of CT scans which is the main diagnostic tool for TBI. Also considered was the issue of polytrauma injuries and other fatalities. [8].

The data on the burden of injury and TBI in Uganda is scarce compared to other sub-Saharan African countries. According to a Ministry of Health report [9], the annual incidence of injury in Kampala is about 116/1000, while the injury leading to disability is 23/1000. The injury mortality rate is 220/100,000 with a 2.8/1000 incidence of non-fatal injuries. Reports emanating from facility-based studies in Uganda observed a cumulative incidence of TBI hospital admissions at 89/100,000 with a very high TBI-related mortality of between 45% and 75% [10]. Tanzania as a rapidly developing country in Africa has very high traffic-related deaths and disabilities and most of these are from brain injuries. A six hospital-based study between November 2017 and December 2018 revealed an interesting distribution. Road traffic accidents accounting for 47.5% was the leading cause of injuries and also accounted for 60% of injuries mortalities [3]. There is a greater chance of being killed in a traffic crash in Tanzania. This is proportional to the number of vehicles on the road and is about 25 times higher than in the USA and some other Western European Countries. This is heightened by almost non-existent pre-hospital care including poor health care service deliveries [11].

A study done at Muhimbili Orthopedic Institute, Dar es salaam Tanzania [3] revealed that about 38% of patients with mild TBI were discharged on the same day of hospital arrival. Others were discharged 24

hours after admission and observation with counseling procedures on symptoms and signs of intracranial pressures, convulsions, and altered level of consciousness administered on them. About 85.6% of the patients had a brain CT scan done. Also, records showed that 36% had brain contusion, subdural hematoma (12.7%), epidural hematoma (24.6%), skull fracture (7.6%), and intracerebral hemorrhage recorded 18.6%. About ninety percent of patients with epidural and subdural hematoma had surgery which was within 6 hours from their arrival. About 88% of those with good recovery (19%), had moderate TBI, while 50.2% recovered with disabilities. Among the 30.7% that died, 78.3% had severe TBI

## **METHODOLOGY**

### **Study Setting**

This study was done at Mnazimmoja Hospital from May 2019 to May 2020. The location of Mnazi Mmoja Hospital is at Urban district in the urban west region along the coast of Zanzibar and it is 6km from Abeid Karume airport. The study was mainly conducted at the Emergency Unit of the hospital and retrospective data concerning head injury were collected.

### **Study design:**

A retrospective observational study was conducted at the Mnazi Mmoja Hospital Emergency unit. The study was done by checking the number of head injury cases that were attended at the Emergency Unit and their outcomes after being managed. Retrospective data concerning head injury were collected. Data were collected from the patients' medical records using a structured questionnaire. The following variables were considered: socio-demographic factors, cause of injury, management and interventions at Mnazi Moja Hospital ( outcome), the severity of the head injury.

### **Inclusion and exclusion criteria:**

All cases of TBI presented at the emergency unit in MMH comprising both males and females of different age groups (children, adults, and elderly people) involved in head injury were included and referral cases were excluded.

## **RESULTS**

**Table 1: Socio Demographic Characteristics of the Subjects**

Variable	Frequency	Percentage (%)
<b>SEX</b>		
Female	18	22.2
Male	63	77.8
Total	81	100.0
<b>Age (years)</b>		
0-15	21	25.9
16-30	40	49.4
31-45	13	16.0
46-60	7	8.6
Total	81	100.0
Mean age = 24.06±13.13		

DISTRICT	Frequency	Percentage (%)
CENTRAL	1	1.2
NORTH	2	2.5
URBAN	27	33.3
WEST	51	63.0
Total	81	100.0

The socio-demographic characteristics of the patients are presented in table 1. The results show 63 males (77.8%) and 18 females (22.2%) participants. The majority of patients were between the age group of 16-30 years and 40 (49.4%) in total. The west district recorded the highest prevalence of patients with injury rates compared to other districts.

**Table 2: Causes of the Traumatic Head injuries**

ASSAULT	11	13.6
FALLING	11	13.6
RTA	55	67.9
STRUCK BY OBJECT	4	4.9
Total	81	100.0

The causes of head injuries are presented in table 2. Road Traffic Accident was the leading cause of injuries (67.9%). Others include assault (13.6%), falling (13.6%), and being struck by an object (4.9%).

**Table 3: Prevalence of the Head injuries among the participants**

DIAGNOSIS	Frequency	Percentage (%)
CONCUSSION	8	9.8
CONTOUSION	15	18.5
EPIDURAL HEMATOMA	7	8.6
SKULL FRACTURE	12	14.8
SUBARACHNOID HEMORHAGE	5	6.2
Total (TBI)	47	57.9
SOFT TISSUE INJURY	26	32.1
Cut Wound	8	9.8
Total ( Non TBI)	34	41.9

**The prevalence of head injuries is presented in table 3. The table shows** a higher prevalence of traumatic brain injury TBI (57.9%), including, concussion (9.8%), contusion (18.5%), epidural hematoma (8.6%), skull fracture (14.8%), and subarachnoid hemorrhage (6.2%). This was compared with other causes of head injuries (42.1%) such as cut wounds (9.8%) and soft tissue injuries (32.1%).

**Table 4: Status of the subjects in all the classes of head injuries**

STATUS	Frequency	Percentage (%)
DEATH	2	2.5
INPATIENT	24	29.6
OUTPATIENT	55	67.9
Total	81	100.0

The status of the subjects is presented in table 4. About 64.2% of the patients were treated as outpatients, with 33.3% as inpatients. About 2.5% of the patients died.

**Table 5: Result of the management of the subjects with the head injuries**

MANAGEMENT	Frequency	Percentage (%)
DONE	78	96.3
NOT DONE	3	3.7
Total	81	100.0

The level of intervention done at the Mnazi Mmoja hospital is shown in table 5. 96.3% of the patients were successfully managed.

## Discussion

The demographic characteristics of this study revealed prominent gender differences with males outnumbering females in as far as head injuries as well as fatal outcomes. The age bracket with the highest prevalence of head injury was 16-30 years. This may not be unconnected with the fact that the majority of the cases are due to road traffic accidents as well as the high rate of young males involved in high-risk activities in boarding and disembarking from moving buses and motorbikes. The study agreed with the findings of other researchers [3], with road crashes appearing as the highest cases among young adult males. This is very worrisome and a wake-up call to the government to increase health promotion in the form of health education to curtail this menace with dire consequences on this important age group in our society. The study also recorded a higher prevalence of traumatic head injury THI (57.9%), including, concussion, contusion, epidural hematoma, skull fracture, and subarachnoid hemorrhage as compared to other forms (42.1%) of injuries such as cut wound and soft tissue injuries. Incidentally, the death rate among these cases was very low (2.5%). This could be attributed to the timely and efficient management mechanism at the Mnazi Moja Hospital. TBI patients' survival is highly dependent on accurate and timely management [12][13]. The west district with the highest prevalence of 63% could be attributed to its large size as well as the nature of roads. The non-availability of constant road monitors as traffic wardens around these districts may have affected this high disparity.

## Conclusion

The result of this study has shown the prevalence of head injuries in Zanzibar. Since most of these head injury cases are due to road traffic accidents, there is a need for appropriate preventive measures to help reduce the high frequency of head injury in our population. Public awareness campaigns and health promotions concerning road safety rules are needed to help reduce this ugly incidence of road traffic crashes. This should be carried out as frequent radio and television jingles in the Kiswahili language to reach the grassroots and the entire population. Government should also pay attention to the improvement of roads as a way to curb this menace.

The major limitation of this study could be the number of samples. Although the sample size using a prevalence of 5% [3] was 73, we wanted to raise the sample size to more than a hundred. Other researchers equally experienced the same situation [14]. It is plausible that the effect of covid may have affected the attendance of the hospital by these patients. Some of the patients were equally excluded based on incomplete data.

## Ethical Approval

Approval was obtained from the Zanzibar Health Research Institute with No; ZAHREC/03/ST/MARCH/2020/44.

## Consent

Individual informed consent was not considered as the study used patients' medical records

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