

ASSESSMENT OF MAGNITUDE AND OUTCOMES OF HEAD INJURY IN  
MYUNGSUNG CHRISTIAN MEDICAL CENTER (KOREA HOSPITAL),  
ADDIS ABABA, ETHIOPIA.

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ADDIS ABABA, ETHIOPIA

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**JUNE, 2017  
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## **ABSTRACT**

**Background:** Trauma, especially head trauma, is an expanding major public health problem and the leading cause of death of the young and productive part of the world's population.

**Objective:** To assess the magnitude and outcomes of head injury among patients presented to adult emergency department of Myungsung Christian medical center, from January 01, 2016 to January 01, 2017, Addis Ababa Ethiopia.

**Methods:** Institutional based retrospective, cross sectional study was conducted at Myungsung Christian medical center, from January 01, 2016 to January 01, 2017, Addis Ababa Ethiopia.

All head injury patients who fulfills inclusion criteria and visited Myungsung Christian medical center during the period from January 01, 2016 to January 01, 2017 were selected for the study.

**Result.** From total of 673 trauma patients visited adult emergency of MCM hospital from January 12016 to January 1, 2017, there were 168 head injury patients and included in this study of which 124 (73.8%) were males and 44(26.2%) were females. From the 168 head injury patients, severity of head injury was categorized depending on GCS and 11(6.4%) severe, 73 (43.5%) moderate and 84(50%) were mild type of head injury. Road traffic accident was the leading 59(43.3%) followed by fall down accident 49(35.8%) and assault or fighting measures for 29(21.2%) of head injury patients. The majority of the patients 99(58.8%) were improved, 28(16.7%) cured, 7(4.2%) died and 34(20.2%) were with unknown outcome because they were referred to other hospitals.

**Conclusion:** the analysis of this study revealed that road traffic accident is the major cause of head injury and head injury patient with associated injury are more at risk to develop complications than with no associative injury.

**Key words:** head injury, magnitude, outcomes, retrospective, Myungsung Christian medical center.

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## **LISTS OF ABBREVIATIONS /ACRONYMS**

**ED** - Emergency department

**EM**- Emergency medicine

**GCS**- Glasgow coma scale

**JUTH**- Jimma university teaching hospital

**MCM**- Myungsung Christian medical center

**MD**- Medical doctor

**MTBI**-Mild traumatic brain injury

**RTA**- Road traffic accident

**SDH**- Subdural hematoma

**TBI**-Traumatic brain injury

**UK**- United Kingdom

**USA**- United States of America

**WHO**- World health organization

# **1. INTRODUCTION**

## **1.1 Background**

Head Injury has been defined as, “morbid state, resulting from gross or subtle structural changes in the scalp, skull, and/ or the contents of the skull, produced by mechanical forces; trauma, especially head trauma, is an expanding major public health problem and the leading cause of death of the young and productive part of the world’s population. Depending on severity using GCS, head injury classified into mild, moderate and severe. Research is mainly done in high-income countries where only a small proportion of the worldwide fatalities occur.”<sup>(1)</sup>

Globally, head injury is a substantial cause of mortality and morbidity across all age groups, with a disproportionately greater burden borne by low- and middle-income countries. In less-resourced settings, the burden of head injury is magnified by the high prevalence of risk factors and by health systems which are often unable to effectively deliver the acute and long-term care the patients require (2). A recent review of the global impact of traumatic brain injury (TBI) identified that opportunities to adequately address this burden are compromised by limited epidemiological data on the causes and characteristics of these injuries. This gap is particularly apparent in Pacific Island countries and territories which are infrequently the focus of global public health attention (4). A Centers for Disease Control and Prevention analysis of hospital, emergency department (ED), and vital statistics databases estimated that about 1.4 million people presented for medical care for a traumatic brain injury each year in the United States from 1995 through 2001. The analysis also found that approximately 50,000 (3.6%) of them died from their injuries, 235,000 (17%) were hospitalized, and 1.1 million (80%) were treated and released from the ED (5). Reviews of head injury epidemiology conclude that comparison of incidence rates from different studies is difficult because of variations in definitions and inclusion criteria, admission policies and health care systems within and between countries (6).

In a recent review by Tagliaferri et al., annual incidence rates of hospital admitted head injuries varied between 91 and 546 per 100,000 populations per year in European countries (6).

## **1.2. Statement of the Problem**

The World Health Organization (WHO) global burden of injury estimate ranks injury among the top ten leading causes of death, with an estimated 5 million deaths annually of which men in Africa 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 (2).

The incidence of TBI worldwide is rising, mainly owing to injuries associated with the increased use of motor vehicles, particularly in middle-income and low-income countries. Estimates of TBI incidence show substantial variation between countries. Data from the CDC indicate that each year in the USA, 1.7 million people sustain a TBI. A 1.4 million of these injured individuals are treated in emergency departments, with around 275,000 hospitalizations and 52,000 fatalities. A meta-analysis of reports from 23 European countries revealed a hospital admission incidence of 235 per 100,000 people (5). The annual incidence of traumatic brain injury in different African countries ranges from 150-500/100,000 per year depending on the individual country. It is estimated that 1-2% of high income populations live with a TBI disability and the incidence is high in some countries in Africa. In South Africa, the mortality rate of TBI was reported to be 81/100,000 per year; with greater than 10% of all case fatality rate. High risk groups for TBI include adolescents, young adults and the elderly, with males being affected 2-3 times more often than females. The study also showed that the main causes and risk factors for head injury in Africa are road traffic accident (RTA), falls and violence (4).

In Ethiopia, a prospective study which was conducted at JUTH on 52 head injury patients indicated that the main risk factors are interpersonal fight 20 (38.5%) followed by RTA 19 (36.5%) and of all injuries 8 (15.4%) were due to falling accidents. According to this study, the most affected age groups are < 15 years 17 (33%), 15- 24 years 17 (33%), 25- 34 years 9 (17%), 35- 44 years 4 (9%) and greater than 45 years accounts 5 (10%) (8).

In Ethiopia, even though there was not enough research conducted on head injury in the country's context, the prevalence of head injury is a common health problem that causes morbidity and mortality in the productive age group of population which directly affects the development of the country. Study which was conducted in Ethiopia at JUTH in 2010 indicated that head injury is a common public health problem of all traumas. So, since the problem affects the productive age group of the country, I am interested to carry out my study on this topic which assesses the magnitude and outcome of head injury.

### **1.3. Significance of the study**

The study would add knowledge on understanding the magnitude and outcome burden of head injury accidents in the country at large which helps concerned body for planning how to prevent the occurrence of the incident. In addition, the study would provide base line information on magnitude and associated outcomes of head injury cases. The result of this study will be used by concerned bodies for planning and evaluating how to prevent the head injury. The recommendation of this study could benefit the public at large in preventing head injury accidents if due to consideration is given.

## 2. LITERATURE REVIEW

Traumatic brain injury (TBI) is an important global public health problem as a major cause of traumatic death and disability. The spectrum of severity of TBI varies, but most TBI is classified as mild traumatic brain injury (MTBI) followed by moderate and severe head injury, based on clinical and surveillance definitions. From a public health perspective, it is important to know the incidence of a condition in order appropriately to plan healthcare policy and provision. Furthermore, determining what factors increase the risk of MTBI is necessary to develop public health programs to prevent the problem and lessen the likelihood of disability (11).

According to a study which was conducted in Korea, a total of 349621 people were injured per year in which 9057 people died within 72 hrs after accident and the mortality rate due to MVA is 28 per 100,000 people and from total injury, 68414 victims were head injuries. The mortality rate of the head injury was 9.5% and the total number of death due to head injury was calculated to be 8976 per year and the annual death rate due to head injury was to be 19 per 100,000 populations. According to this study, skull fracture was found in 43% in which operative intervention was required in 28% and the operative mortality rate was 6%. The severity of head injury based on GCS was mild in 73.4%, moderate in 11.4%, and severe in 16.3% (13). According to study which was conducted in Norway, of 585 head injury patients which were included in the study after evaluation in emergency room, 446(76%) were admitted for hospitalization giving an admission rate of 157 per 100,000 population. This study classifies the distribution of head injury based on GCS and presence or absence of consciousness at time of examination to 492 (84%) mild, 16 (3%) moderate and 77 (13%) severe head injury. Sex specific incidence rates were 258 per 100,000 for males and 156 per 100,000 for females and high age specific incidence rates for men were found in the age group 10-24 years with the peak (428 per 100,000 among teenagers between 15- 19 years). According to this study the causes of head injury were falls in 299 (51%), RTA in 126 (21%), assaults in 81(14%) and other in 79 (14%) cases and male to female ratio was highest for head injury caused by assaults (2.9:1) and lowest for by RTA (1.4:1) (6). A Study which was conducted on hospitalized and fatal head injuries in VitiLevu, Fiji, during the 12-month injury surveillance period indicated that Out of 2,233 individuals admitted to hospital as a result of injury, 276 cases (12.4%) had a primary diagnosis of head injury.

The overall rate of head injuries was 42.4/100,000 and over three quarters of cases were male and the age- standardized rate for males for all head injuries (60.5/100,000 (95% CI 52.1, 68.8)) was more than three times of the female rate (18.4/100,000 (95% CI 13.7, 23.1);  $p! 0.001$ ). Head injuries are most commonly occurred among those aged 15–29 years, followed by children aged 0–14 years and least common among older adults (45 years and older). Of the three leading causes of injury, road traffic crashes had the highest rate of head injury (16.1/100,000 (95% CI 13.1, 19.2)), followed by falls (12.0/100,000 (95% CI 9.3, 14.6)) and „hit by person or object“ (10.6/100,000 (95% CI 8.1, 13.1)) (4).

A prospective study which was conducted at Tertiary Care Hospital in India during period between 2011- 2013 on 500 head injury patients indicated that the majority of head injuries are due to Road Traffic Accident 298 (59.60%) cases followed by fall from Height 101 (20.20%) cases, Assault 21 (4.20%) and occupational head injury 79 (15.80%) cases, whereas other like gunshot comprised of 1 (0.20%) cases.

The peak incidence of head injury was observed in the age group 21-30 years comprising 45% of the cases and it was also observed that 21% belonged to the age group 31-40 years.

Out of 500 cases 383 (76.6%) were males while 117 (23.4%) were females, thus a male to female ratio of 3.27:1 was observed and head injury commonest lesion was Scalp laceration which accounts 251 (50.2%) cases, followed by fractures of skull 83 (16.6%) cases, contusion 53 (10.6%) which is commonest in intra-cranial lesions. SDH 61 (12.2%) was commonest intra-cranial hemorrhage followed by SAH 52 (10.4%) cases. This study also showed that most commonly involved skull fracture in head injury cases were temporal bone 22 cases (26.51%) followed by frontal bone which was 21 cases (25.30%), multiple bone 24 cases (28.92%), parietal bone 12 cases (14.46%) and occipital bone 4 cases (4.82%) (14).

According to another study which was conducted in India on 2850 head injury in which age of the victims varied from 15 – 80 years indicated that the peak incidence was observed in the age group 15 - 24 years comprising 34.46 % of the cases, 22.15 % belonged to the age group 25- 34 years, 56.61 % of cases comprised of age group of 15 - 34 years. Individuals in the age group 65 years and above were the least affected that is 4.21 % of total cases. Out of total cases 2442 (85.68%) were males while 408 (14.31%) were females which shows a male to female ratio of 6:1 and the majority of victims are of road traffic accident 1568 (55.02%) cases followed by assault 646 (22.67%) cases. Fall from height 361 (12.67%) and gunshot were 245 (8.59%) cases,

whereas occupational comprised of 30 (1.05%) cases. Skull fracture was seen in 969 (34.0%) individuals out of total 2850 cases and among the intracranial injuries, epidural hemorrhage was the commonest, present in 495 (17.36%) cases and subdural hemorrhage present in 217 (7.6%) cases, followed by subarachnoid hemorrhage in 102 (3.50%) cases and Contusions of the brain parenchyma were present in 325 (11.4%) cases (16). A Study which was conducted in Egypt at Assiut University indicated that, total number of head injured cases were 1331 out of 43,310 total number of trauma patients with an incidence of 3.07%. Head injuries due to road traffic accidents represents 60.9% (810 cases) and 35.8% of cases (290) were in age group between 20-30 years, followed by the age group between 10-20 (22.2%) and 30- 40 (18.52%), the least affected age group was age greater than 60 (4.9%) and less than 10 ( 2.5%). Males affected more than females which accounts 85.7% of males and 14.3% of females with a ratio of 6:1 (17).

In 1100 (83%) patients out of 1331, head injury was associated with major bone fracture in other body regions and 231 (17%) were pure head injuries. 182 (79%) of patients with pure head injuries were due to road traffic accidents, 43 (24%) of them had lacerated wounds in the scalp and the radiological examination revealed nothing. The remaining patients 139 (64%), the radiological findings varied from skull fracture (36.7%), brain contusion (28.7%), and hematoma (23%) and diffuse brain injury (33.1%). Patients with radiological findings (139) were classified according to Glasgow Coma Scale (GCS) into: severe (GCS < 8) which accounts (32%), moderate (GCS 9-12) accounts 22% and mild (GCS 13-15) accounts 46%. Complete recovery occurred in 93.7% of cases with GCS 13-15 while recovery was not recorded among patients with GCS < 8. Death occurred in 66.6% of patients with GCS < 8 and 3.3% in GCS 9-12 (17). According to a study conducted in Nigeria, A total of 3282 patients were admitted during the study period of whom 428 (13.0%) had head injuries. There were 342 (79.9%) males and 86 (20.1%) females with males to females ratio of 3.9:1 and incidence was common in age between 21- 30 years (n=145, 33.8%), while the least were those between 71-80 years (n=3, 0.7%). Road traffic accidents (RTAs) were the most common cause of injury accounting for 307 (71.7%) patient. 244 (57.0%) had associated injuries along with head injury of which fractures were the majority (n=93, 21.7%) and with skull fracture being the most common (n=27, 26.5%). Lacerations, abrasions and other blunt injuries also made up a significant portion of injuries (n=52, 12.1%), followed by intracerebral/ subdural hemorrhages (n=13, 3.0%) (18). According to this study, severity of head injury on Glasgow coma scale indicated that majority of patients suffered mild head injury (277, 64.7%), 58 (13.6%) suffered moderate head injury, while 93 (21.7%) sustained severe head injury. A total of 194 (45.3%) patients presented with history of loss of consciousness (LOC) with duration of less than 1 hour in 46 (23.6%) patients, 1 hour to 24 hours in 62 (31.8%) patients and greater than 24 hours in 87 (44.6%) (17).

According to the study which was conducted at JUSH which is Four (4) month Prospective study, on 52 head injury patients indicated, female to male ratio was 1:9 and Interpersonal fight (n=20, 38.5%) and traffic Accidents (n=19, 36.5%) accounted for most of the injuries.

Of all injuries, 15.4% (n=8) were due to falling accidents mainly in children and distribution of the severity of injury measured with the initial Glasgow Coma Score (GCS) indicates that 37 (71%) of all patients were discharged with a good recovery Glasgow Outcome Scale (GOS) 5, 7.7% .(18)

with a disability and 21.2% died and All patients with initial GCS greater than 6 survived whereas almost all patients with initial GCS 6 and less were died and Patients with both non-reactive pupils at the initial examination died in 87.5% of cases (19). This study also showed patients who sustained injury from fight or fall were more likely to have an outcome with good recovery (GOS 5) compared to patients with road traffic injury (RTI) or other causes. Only 10% of the patients who sustained injury from interpersonal fight had an initial GCS below 9 compared to 52.6% in RTI patients. In this study, 40 (77%) of all patients were managed conservatively. Twenty-seven (27) patients had a skull x-ray which showed a fracture in 15 cases and nineteen (19) patients had no skull x-ray done. Median initial GCS of the patients that had visible skull fractures on the x-rays was 13 and patients who underwent no skull x-ray had a median initial GCS of 10 (20).

### **3. OBJECTIVES**

#### **General Objective**

- ❖ To assess the magnitude and outcomes of head injury presented to adult ED of Myungsung Christian medical center (Korea hospital,) from January 01, 2016 to January 01, 2017, Addis Ababa, Ethiopia.

#### **3.2 Specific Objectives**

- To determine the magnitude of head injury among patients presented to adult ED of Myungsung Christian medical center.
- To identify mechanism of injury associated with head injury among patients presented to adult ED of Myungsung Christian medical center.
- To assess the outcomes of head injury among patients presented to adult ED of Myungsung Christian medical center.

## **4. RESEARCH METHODOLOGY**

### **4.1 Study area and Period**

Myungsung Christian medical center (MCM) is located in the southeastern part of Addis Ababa, the capital city of Ethiopia. MCM compound is consisted of two wings; shalom wing with the capacity of 161 bed facility;(40)surgical,(25)medical,(20) pediatrics, seven OBGs, ten ER and (11) intensive care and grace wing with the capacity of 67 beds, as well as a separate medical college with a 6 year curriculum including internship. MCM offers ophthalmologic, dental, plastic surgery, ENT, psychiatry and hemodialysis services as part of community health programs, in addition to general medicine, pediatrics and obstetrics& gynecology. Long term expatriate staff includes one American family medicine doctor, 4 Korean-American physicians (general surgeon, anesthesiology, radiology and pathology), one Norwegian plastic surgeon, and one Korean dentist.

The study period was from December to June, 2017.

### **4.2 Study Design**

Institutional based retrospective, cross sectional study was conducted to asses magnitude and outcomes of head injury patients presented to MCM from January 01, 2016 to January 01.2017.

### **4.3. Source Population**

All patients presented to adult ED of Myungsung Christian medical center (Korea hospital,) were the source population for the study,

### **4.3. Study population**

All head injury patients presented to adult ED of Myungsung Christian medical center (Korea hospital,) from January 01, 2016 to January 01, 2017

### **4.4. Inclusion and exclusion criteria**

#### **4.4.1. Inclusion criteria**

All selected head injury records of patients visited adult ED of Myungsung Christian medical center (Korea hospital,) from January 01, 2016 to January 01, 2017, whose age is above 13 years were included in the study.

#### **4.4.2 Exclusion criteria**

- Head injury Patients chart that has inadequate data (greater than 20% incomplete) were excluded.
- Head injury patient's charts which are lost from record office due to consultation, transfer or any other medical reason at the time of data collection were excluded.
- Head injury patients who are died at arrival were excluded.

#### **4.5. Sample size and sampling techniques**

All head injury patient who fulfills inclusion criteria and visited Myungsung Christian medical center (Korea hospital) during the period under study were included in the study as sample size and convenient sampling technique was employed.

#### **4.6. Variables**

##### **4.6.1 Dependent variables**

- ✓ magnitude of head injury
- ✓ Outcomes of the head injury

##### **4.6.2 Independent variable**

- Age
- Sex
- Mechanism of head injury

#### **4.7. Data collection tools and procedures**

For data collection, check lists which was developed after review of similar literatures was used and data were recorded on structured check lists through reviewing of patient chart retrospectively. Three BSc nurses were recruited for data collection after they have given one day training on data collection tools and techniques.

#### **4.8. Data processing and Analysis**

After the collected data checked for completeness and consistency, data were encoded and entered to SPSS Version 21.0. After entering, data were cleaned, arranged, and analyzed using descriptive statistics. Results were showed using frequency tables, bar graphs, pie chart and cross tabulation.

#### **4.9. Data quality assurance**

Pretest was done on 5% of study sample patient chart at study setting who excluded from final study to check the validity and reliability of data collection tools and necessary modifications was made based on the findings. Prior to data collection period, one day training was given for data collectors. Onsite supervision was given to solve any ambiguity with data collection tools and techniques and the filled check lists were cross checked at the end of each data collection day for completeness and consistency.

#### **4.10. Ethical consideration**

The proposal was presented to Addis Ababa University, Emergency department and ethical clearance was obtained from Addis Ababa University, College of health sciences and IRB. In order to obtain permission to proceed with data collection, the official letter was written to MCM administrations. During patient chart review confidentiality was kept and any patient information was not transferred to any other organ.

#### **4.12. Dissemination plan**

The result of this study was given to the study setting and to Addis Ababa University, College of health science, department of Emergency medicine, and the finding would be disseminated to concerned bodies such as service providers, policy makers and other concerned stake holders. Finally, this paper would be published through relevant journals.

#### **4.11. Operational definitions and definition of terms**

**Prevalence-** the total number of cases of a disease in the given statistical population at a given time.

**Head injury-** physical damage/ structural change to the scalp or skull due to any type of external force to the head.

**Traumatic brain injury (TBI)** - alteration in brain function which is manifest as confusion, altered level of consciousness, coma, seizure, and etc.

**GCS-** Glasgow coma scale used for assessing the neurological status of the patient.

**Trauma-** any serious injury to the body often resulting from violence or an accident.

**Mild head injury-** an injury to the head when Glasgow coma scale is between 13 and 15.

**Moderate head injury-** an injury to the head when Glasgow coma scales between 9 and 13.

**Severe head injury-** an injury to the head when Glasgow coma scale is less than or equal to 8.

## 5. RESULT

### 5.1 Socio-demographic data:

This retrospective institutional based study was done at Myungsung Christian medical center (Korean hospital) which is found in Addis Ababa and located around the place called Gerji.

From total of 673 trauma patients visited adult emergency of MCM hospital from January 1, 2016 to January 1, 2017, there were around 200 head injury patients and 168 head injury patients included in this study. The remains are excluded by the study exclusion criteria.

Among these 168 head injury patients, 124 (73.8%) were males and 44(26.2%) were females.

**Table 1 gender of head injury patients at MCM hospital from January 1.2016 to January 1, 2017**

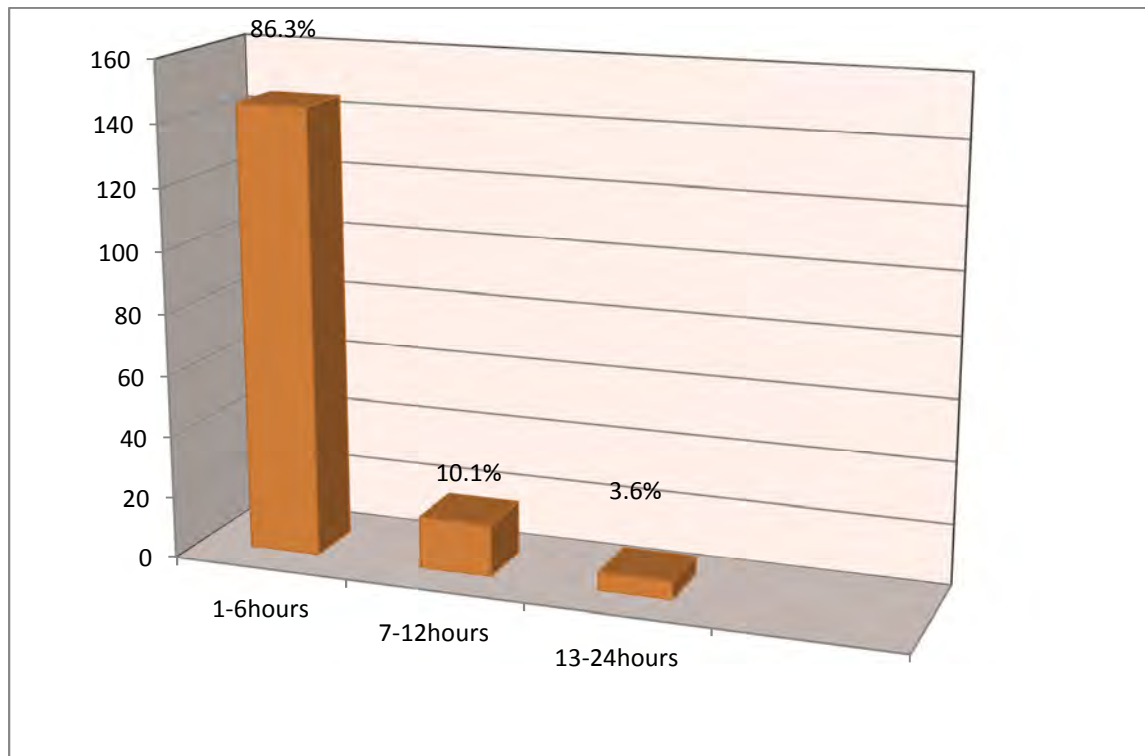
|        | Frequency | Percent |
|--------|-----------|---------|
| male   | 124       | 73.8    |
| female | 44        | 26.2    |
| Total  | 168       | 100.0   |

The majority of head injury patients 77(45.8%) found in age interval of 13-30years, 56(33.3%) in 31-45years and 35(20.8%) above 45 years old.

**Table 2. Age interval of head injury patients in MCM hospital from janury1, 2016 to January 1, 2017.**

| Age interval of head injury patients |                  | Frequency | Percent |
|--------------------------------------|------------------|-----------|---------|
|                                      | 13-30 years old  | 77        | 45.8    |
|                                      | 31- 45 years old | 56        | 33.3    |
|                                      | above 45         | 35        | 20.8    |
|                                      | Total            | 168       | 100.0   |

Regarding time of hospital presentation after head injury the majority of patients 145(86.3%) presents within the first 1-6 hours duration, 17(10.1%) within 7-12 hours and 6(3.6%) of head injury patients within 13 -24 hours duration.



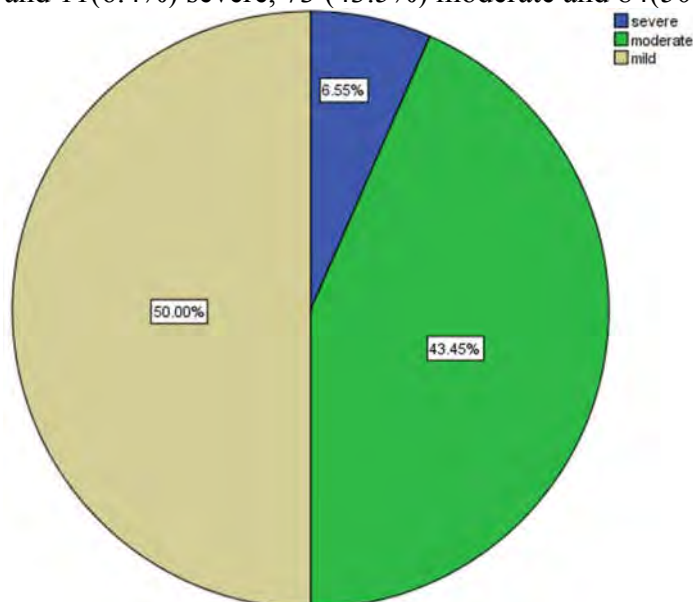
**Figure 1. Duration of hospital presentation after head injury at MCM from January 1, 2016 to January 1, 2017.**

From one of the check list of this study, patient hospital stay after presentation was checked and large number of head injury patients 61(36.3%) had 3-7days, 45(26.3%) more than one week, 49(29.2%) 24-48 hours and 13(7.7%) less than 24 hours.

**Table 3 length of hospital stay of head injury patients at MCM from January 1, 2016 to January 1, 2017.**

| Length of stay in hospital |                    | Frequency | Percent |
|----------------------------|--------------------|-----------|---------|
|                            | less than 24 hours | 61        | 36.3    |
|                            | 24-48 hours        | 45        | 26.8    |
|                            | 3-7 days           | 49        | 29.2    |
|                            | more than one week | 13        | 7.7     |
|                            | Total              | 168       | 100.0   |

From the 168 head injury patients, severity of head injury was categorized depending on GCS and 11(6.4%) severe, 73 (43.5%) moderate and 84(50%) were mild type of head injury.



**Figure 2 severity of head injury admitted to MCM hospital from January 1, 2016 to January 1, 2017.**

From this study, the mechanisms of head injury were identified, and road traffic accident was the leading 59(43.3%) followed by fall down accident 49(35.8%) and assault or fighting measures for 29(21.2%) of head injury patients. From 137 head injury patients, 113 (82.5%) were blunt injury and 24 (17.5%) patients were penetrate types of head injury. Table 4 blow shows the mechanism of head injury with their types

**Table 4 . Cross tabulation of mechanisms of head injury with their types (penetrate, blunt) at MCM hospital from January 1, 2016 to January 1, 2017.**

|                           |                       | identified head injury |           | Total |
|---------------------------|-----------------------|------------------------|-----------|-------|
|                           |                       | blunt                  | penetrate |       |
| mechanisms of head injury | road traffic accident | 56                     | 11        | 67    |
|                           | assault               | 30                     | 13        | 43    |
|                           | fall down             | 50                     | 8         | 58    |
| Total                     |                       | 136                    | 32        | 168   |

**Table 5 Chi-Square Tests of mechanisms of head injury with identification**

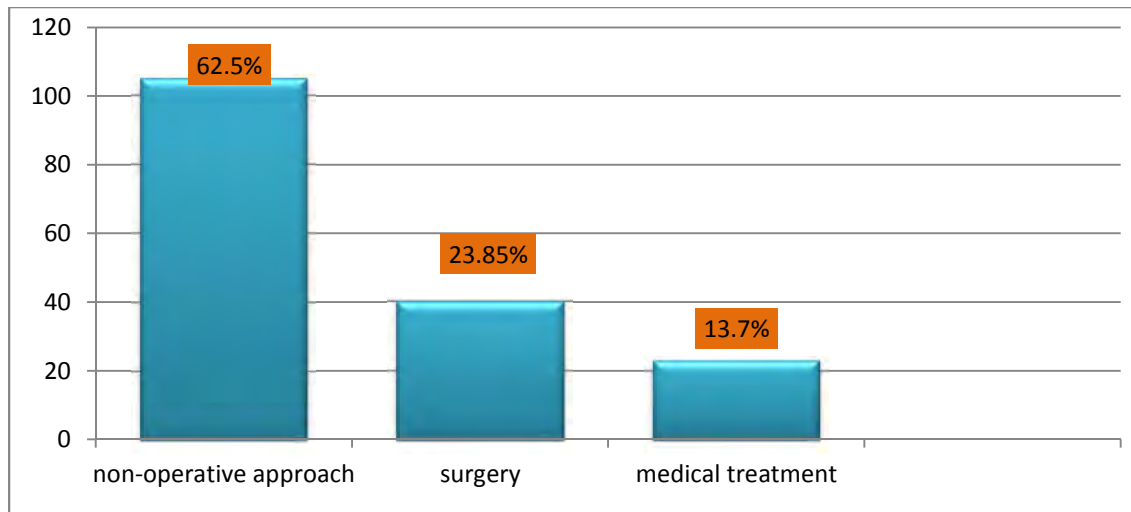
|                                                                                        | Value              | df | Asymp. Sig. (2-sided) |
|----------------------------------------------------------------------------------------|--------------------|----|-----------------------|
| Pearson Chi-Square                                                                     | 4.828 <sup>a</sup> | 2  | .089                  |
| Likelihood Ratio                                                                       | 4.526              | 2  | .104                  |
| Linear-by-Linear Association                                                           | .086               | 1  | .770                  |
| N of Valid Cases                                                                       | 168                |    |                       |
| a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 8.19. |                    |    |                       |

Regarding associated injury with head injury, 31(18.5%) have skull fracture and 137(81.5%) have no skull fracture. 12 (7.1%) of patients have neck injury where 156(92.9%) no neck injury. Assessment for chest injury was on study check list and 20 (11.9%) of patients were with chest injury while 148(88.1%) were not. The result of this study also shows that **5(3%)** of patients were have abdominal injury and 163(97%) got no abdominal injury. The check list of pelvic injury shows 18(10.7%) of patients were with pelvic injury and 150(89.3%) with no pelvic injury. **Table 6** blow shows the associated injury of head injury

**Table 6 associative injury of head injury patient in MCM hospital from January 1, 2016 to January 1, 2017.**

| <b>Associative injuries</b> | <b>Yes</b>       | <b>No</b>         | <b>Total</b>     |
|-----------------------------|------------------|-------------------|------------------|
| Skull fracture              | <b>31(18.5%)</b> | <b>137(81.5%)</b> | <b>168(100%)</b> |
| Neck injury                 | 12(7.1%)         | 156(92.9%)        | 168(100%)        |
| Chest injury                | 20(11.9%)        | 148(88.1%)        | 168(100%)        |
| Abdominal injury            | <b>5(3%)</b>     | <b>163(97%)</b>   | <b>168(100%)</b> |
| <b>Pelvic fracture</b>      | <b>18(10.7%)</b> | <b>150(89.3%)</b> | <b>168(100%)</b> |

From the total of head injury patients presented to MCM hospital, they undergo the treatment of 105(62.5%) were treated with non-operative approach, 40(23.8%) surgery and 23(13.7%) of patients were had medical treatment.



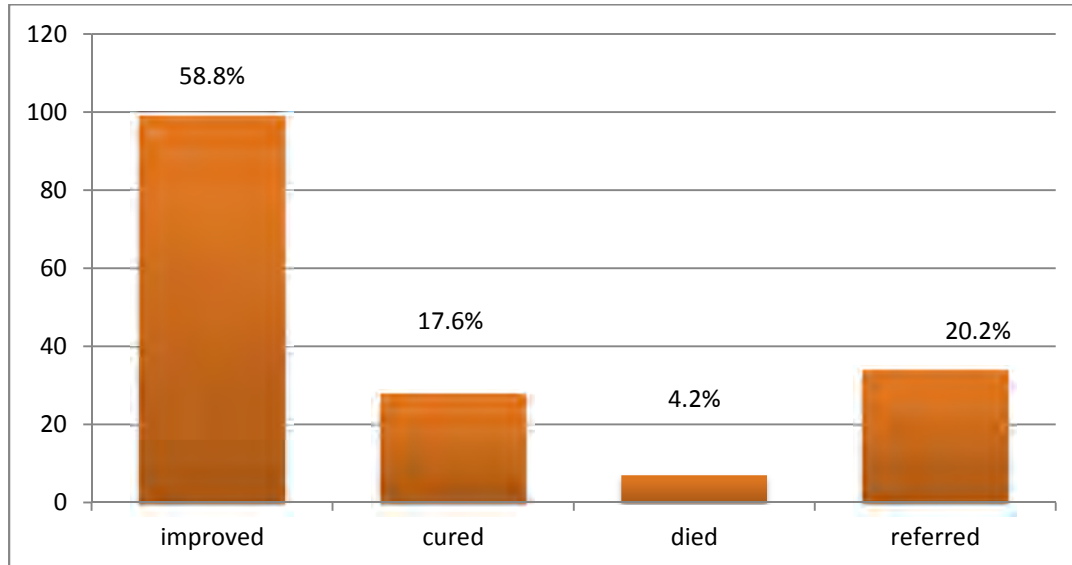
**Figure 3** types of treatment given for head injury patients in MCM from January 1, 2016 to January 1, 2017.

Among head injury patient treated in in MCM hospital, the majority of the patients 144(85.5%) had no complications, 13(7.7%) were developed neurological deficit, 7(4.2%) wound sepsis, 2(1.2%) seizure development and 2(1.2%) were develop meningitis.

**Table 7 . Complication of head injury in MCM hospital from January 1, 2016 to January 1, 2017.**

|                      | Frequency | Percent |
|----------------------|-----------|---------|
| wound sepsis         | 7         | 4.2     |
| meningitis           | 2         | 1.2     |
| neurological deficit | 13        | 7.7     |
| seizure development  | 2         | 1.2     |
| no complications     | 144       | 85.7    |
| Total                | 168       | 100.0   |

Regarding the outcome of head injury patients, the majority of the patients 99(58.8%) were improved, 28(16.7%) cured, 7(4.2%) died and 34(20.2%) were with unknown out come because they were referred to other hospitals.



**Figure 3 the outcomes of head injury patients in MCM hospital, From January 1, 2016 to January 1, 2017.**

## 6. DISCUSSION

The objective of this study is to assess magnitude and outcome of head injury. The study setting was at MCM hospital and the totals of 168 head injury patients were included in the study.

According to study done in Egypt at Assiut University on 1331 head injury patients, Males were more affected than females which accounts 85.7% of males and 14.3% of females with a ratio of 6:1 (14). This is nearly similar to this study which was done on 168 head injury patients in which males were more affected than females, i.e. male accounts 73.8% and female accounts 26.2%.

This is also similar to the finding of India on 2850 head injury cases, 2442 (85.68%) were males while 408 (14.31%) were females with a male to female ratio of 6:1 (16).

Different study also shows young part of the population were mostly sustained head injury which are productive age groups. According to study done in Norway on 585 head injury patients, high age specific incidence rates were found in the age group 10-24 years with the peak incidence among teenagers between 15- 19 years.

This is nearly similar to this study in which high age specific incidence rates were found in the age group of 13-30 years which accounts 45.8% head injury patients followed by 31-45 years which accounts 33.3% head injury patients which are productive age group of the country and this is also nearly similar with other study conducted in tertiary care Hospital in India in which the peak incidence of head injury was observed in the age group 21-30 years comprising 45% of the cases and it was also observed that 21% belonged to the age group 31-40 years (15).

According to the study conducted in Norway on 585 head injury patients, the causes of head injury were mostly by falls in 299 (51%), RTA in 126 (21%), interpersonal violence in 81 (14%) and other in 79 (14%) (6).

In contrast to the above study, in this study which was conducted on 168 head injury patients, the cause of head injury were mostly from road traffic accident accounts 43.3%

followed by fall down accidents which accounts 35.8% and 21.2% were Interpersonal violence.

According to the study done in India, Skull fracture was seen in 969 (34.00%) individuals out of total 2850 head injury cases and among the intracranial injuries, epidural hemorrhage was the commonest, present in 495 (17.36%) cases (16). This is fewer than the finding of this study, skull fractures were seen in 18.5% individuals out of total 168 head injury cases. According to study conducted in India in which skull fracture was seen 69.63% patients.

According to study conducted in Nigeria on 428 head injury patients, based on Glasgow coma

scale majority of the patients suffered mild head injury (277, 64.7%), 58 (13.6%) suffered moderate head injury, while 93 (21.7%) sustained severe head injury (18). This is nearly similar to the finding of this study which was conducted on 168 head injury patients, the severity of head injury based on Glasgow coma scale, majority of the patients were sustained mild head injury 50% with GCS score of 13-15, moderate head injury 43.4% with GCS score of 9-12 and the remaining 6.5% were severe head injury with GCS of 8 and less but nearly different from study conducted in Korea on 68414 head injury patients, the severity of head injury were classified based on GCS score was mild in 73.4%, moderate in 11.4%, and severe in 16.3% (13).

Different study indicates that most of head injury patients were managed conservatively as study conducted in JUTH on 52 head injury patients, 77% of all patients were managed conservatively with fluid resuscitation and antibiotics administration (1) which is nearly similar to this study in which almost all head injury patients, 62.5% of all patients were managed conservatively with non-operative approach, for 23.85% with surgery and 13.7% with medical treatment. In this study, concerning the outcomes at ED, head injury patients 58.8% with GCS score of 13-15 were improved and discharged from ED with good recovery, 17.6% were cured and 4.2% were died. This is nearly similar to the study conducted in Egypt, Assuit University on 1331 head injury patients in which complete recovery occurred in 93.7% of mild head injury cases with GCS 13-15 while recovery was not recorded among patients with GCS < 8 and Death occurred in 66.6% of patients with GCS < 8 and 3.3% in GCS 9-12 head injury patients (17).

Another study which was done in JUTH on 52 head injury patients revealed that severity of head injury measured with the initial Glasgow Coma Score (GCS) indicates that 71% of all patients were improved & discharged with a good recovery and 21.2% of all patients were died and all patients with initial GCS greater than 6 were survived whereas almost all patients with initial GCS 6 and less were died (1) which is almost similar to this study. <sup>27</sup>

## **7. CONCLUSION AND RECOMMENDATION**

### **7.1 CONCLUSION**

Depending on the result of this study; from over all trauma admission a significant number is accounted for road traffic accident followed by fall down accident. In this study economically active age group of the population was main victims of the accident and males are affected than females. Head injury patients who were in category of severe head injury and with associative injury, the outcome was death. Skull fracture is number one associative injury with head injury and abdominal injury is the least.

In line with mechanisms of head injury, blunt type of head injury takes a lion share where as penetrate type is the second.

## **7.2. RECOMMENDATIONS**

From this study results, the following recommendations are made.

In this study,

- Road traffic accident is the major mechanism for head injury occurrences; I would like to recommend Addis Ababa city administration to give awareness for the community and drivers to decrease this problem.
- The passengers and those who are crossing and walking on the road side showing poor awareness of road traffic rules both by drivers and passengers, so I want recommend road traffic authority to give awareness to the community and giving training for the drivers about road traffic rules to reduce effect of these problems.
- Hospitals should have emergency alerting response system to save people of suffering head injury.

## **CHALLENGES AND LIMITATIONS OF THE STUDY**

- ✓ The study was conducted in a short period of time and there is shortage of time in writing this research paper.
- ✓ Since all information was taken from patient's profile, there is incompleteness of data to have full information.
- ✓ In general the poor documentation and attachment of the results of investigation of victims was the other major challenge in which many patients chart was incomplete data.

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## ANNEXS

### ANNEX 1. CHECK LIST/QUESTIONNAIRE

Checklist to collect data on retrospective analysis of head injuries from January 01/2016 to January 01/2017 G.C in MCM, Addis Ababa, Ethiopia.

**Table 3 Checklist**

| s.no                                                                | The study variables                   | Response                                                                    | Remark |
|---------------------------------------------------------------------|---------------------------------------|-----------------------------------------------------------------------------|--------|
|                                                                     | Card number                           | _____.                                                                      |        |
| <b>1. Socio-demography of the participants</b>                      |                                       |                                                                             |        |
| 1.1.                                                                | Sex                                   | 1. Male<br>2. Female                                                        |        |
| 1.2.                                                                | Age                                   | _____.                                                                      |        |
| <b>2. History of the patient who attended in the emergency ward</b> |                                       |                                                                             |        |
| 2.1.                                                                | Duration of presentation after injury | _____                                                                       |        |
| 2.2.                                                                | Length of hospital stay               | _____                                                                       |        |
| 2.3.                                                                | Mechanism of head injury              | 1. Road traffic Accident<br>2. Assault<br>3. Fall down<br>4. Other(specify) |        |
| 2.4.                                                                | Identified head Injury                | 1. Blunt<br>2. Penetrating                                                  |        |
| 2.5.                                                                | Severity of head injury               | 1. severe<br>2. moderate<br>3. mild                                         |        |
| 2.6.                                                                | What are the associated injuries      | 1. Skull fractures                                                          |        |

|      |                                 |                                                                                                                                                                                        |  |
|------|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|      |                                 | <ul style="list-style-type: none"> <li>2. Neck injury</li> <li>3. Chest injury</li> <li>4. abdominal injury</li> <li>5. pelvic injury</li> </ul>                                       |  |
| 2.7. | The types of intervention given | <ul style="list-style-type: none"> <li>1. Non operative approach</li> <li>2. Surgery</li> <li>3. Medical treatment</li> <li>4. Other(specify)</li> </ul>                               |  |
| 2.8. | Complications                   | <ul style="list-style-type: none"> <li>1. wound sepsis</li> <li>2. meningitis</li> <li>3. neurological deficit</li> <li>4. seizure development</li> <li>5. no complications</li> </ul> |  |
| 2.9. | Patients outcomes               | <ul style="list-style-type: none"> <li>1. Improved</li> <li>2. Cured</li> <li>3. died</li> <li>4. referred</li> <li>5. Others(specify)</li> </ul>                                      |  |

**ANNEX 2. Declaration**

I, the undersigned, declare that, this is my original work and that all sources of materials used for this thesis are duly acknowledged

Name: ASFAWOSEN WOLDMESKEL

Signature: \_\_\_\_\_

Date of submission: \_\_\_\_\_

Place: Addis Ababa, Ethiopia

This thesis has been submitted for examination with my approval as University advisors.

Name of advisors:

Dr. Tigist Zewudu

Signature\_\_\_\_\_

Date\_\_\_\_\_

Sr.Mebrat Michael (MSC)

Signature\_\_\_\_\_

Date\_\_\_\_\_