Epidemiology, Reported Injury Characteristics of Brain Trauma: Evidences Collected from a Level-One-Trauma Center in Zahedan City, Iran

Minoo Sharbafshaaer1*

1Young Researchers and Elite Club, Zahedan Branch, Islamic Azad University, Zahedan, Iran

*Corresponding Author: Minoo Sharbafshaaer, M.Sc., Young Researchers and Elite Club, Zahedan Branch, Islamic Azad University, Zahedan, Iran. Email: minoosharbaf@gmail.com

1. Background
Traumatic brain injury (TBI) is “the hurt to brain tissue and disruption of the brain function caused by an external mechanical force as evidenced by documented medical records.”

Age and gender are known to be strong prognostic factors following TBI, defining age and gender-critical prognostic should be included in TBI research, as TBI affects these factors. In Iran, the investigations show the distribution of TBI and deaths were more among males rather than females, especially in the elderly age group, thus the males’ population has been reporting the highest risk of injuries in the young ages.

TBI is acquired from a mechanism of brain injury that precedes the traumatic event, and cause different grades of trauma injuries can be temporary or long-lasting, with central or spread injuries in the brain. Moreover, the severity of TBI based on the Glasgow Coma Scale (GCS) is mainly classified as mild, moderate, or severe grades by the loss of consciousness. In most epidemiological studies on the severity of TBI, mild traumatic brain injuries have captured a greater degree of severity. Furthermore, studies declared the more common mechanisms of TBI as car crashes, falls, assaults, motor vehicle, or traffic accidents.

2. Objectives
The present study tries to investigate the characteristics of brain trauma, also few studies have put effort into to clearing other characteristics of brain trauma specifically for TBI patients in Zahedan, Iran. It is therefore essential to identify characteristics factors (sex, age-group, mechanisms, and severity of TBI) for TBI patients and detect the high-risk factors to improve the quality of services and to establish a trauma care system for patients with brain trauma.
3. Methods
This retrospective study commenced a population-based epidemiologic to study TBI in the capital city of Sistan and Baluchistan province, Zahedan, Iran from March 2017 to October 2017 and reviewed TBI-patients records in Khatam trauma emergency department hospital in Zahedan. The medical records based on the ICD-10-CM items include code S07.1 crushing injury of skull and code S06.9 intracranial injury, TBI-related death was collected based on the death certificate, and demographic data.

GCS was introduced for clinical monitoring following TBI and was subsequently used to grade TBI severity followed by 3-8 severe TBI, 9-12 moderate, and 13-15 mild TBI.

Statistical frequency analyses were performed using SPSS version 25.0. Descriptive Statistics with a 95% confidence interval (CI) were utilized to estimate the percent and frequency prevalence of age-groups, severity, and mechanism TBI at Zahedan trauma center.

4. Results
From a total of 445 hospitalized patients for TBI, the mean age of the patients was 32.35 ranging from 17 to >80 years. The patient population included 361 (81.1%) men and 84 (18.9%) women. In particular, 20–29 years of age was the peak of prevalence in TBI patients (44.5%) and the young male population with 20-29 years old were reported to be the main high-risk age group number of TBI (Table 1).

In the severity of TBI, at moderate level of 67.4% the incidence is higher in patients (Table 2). The distribution rate of the causes of brain injury is very diverse, while the first mechanism of TBI was car-accident-multiple-trauma by 44.0% and head trauma by18.9 was the second reason for TBI frequency (Table 3).

Furthermore, the most common principal severity of TBI conducted among TBI patients aged 20–29 years old was at the moderate level, also the males and females’ population with this age group have been known to be at high risk for three degrees of TBI (Figure 1). Most of the traumatic brain injuries that took place by car accident multiple trauma and head trauma show the severity of TBI in both genders (Figure 2).

5. Discussion
The present study estimates the number of TBI patients at the main level-one trauma center hospital located in Zahedan, southeastern Iran. The males continue to have higher rates of TBI compared with females. Whereas, integrating sex and age groups in research is recognized as leading to better science, and ultimately better clinical practice. Other research confirmed that sex, age group, severities, and mechanisms of TBI could be the most important factors for medical care.

Therefore, sex, age groups, severities, and mechanisms of the TBI analytical approach are important to understand TBI so as to improve the quality of life outcomes and rehabilitation for TBI survivors. Males had a higher rate of TBI incidence than females. Also, similar research studies argued that sex and age group are the most commonly identified risk factors, regarding sex and age group relationship, males are nearly three times more likely to suffer a TBI than females. Generally, the males reported more TBI injuries. Also, at Zahedan trauma center 20-29 age group experienced TBI injuries more than other age groups, TBI evidence in Brazil indicates the highest effective epidemiologic vigilance of TBI was in young adults aged 20-29.

This study had a high proportion of patients with a moderate degree of TBI; meanwhile, in Norway trauma centers, moderate TBI was reported as a major degree of head injuries where they recorded history of staying in an...
The result showed the main mechanisms of TBI were vehicle crashes and head trauma. Additionally, in Arizona, traffic vehicle crashes are the most common type of injury in emergency room visits, hospitalizations, and deaths related to TBI. Furthermore, in the Netherlands more than half of the TBI patients were involved in road traffic crashes.

The insights into the causes, patterns, and distributions of TBI patients from this study will be extremely helpful in policymaking, research, health management, and rehabilitation at the national level in our country and other developing nations. These methods provide promises for future studies to further clarify the true epidemiology of characteristics injury of brain trauma, which in turn will guide the development of clinical endpoints for diagnostic and the outcome of studies and data collection are of great importance in TBI studies, and is crucial to advance the care for TBI patients in the future. Current approaches are often crude and widely divergent, using only momentary or summary measures. Here, we see a great need for the use of advanced information technology, and further research into the best approaches to these analyses. Further work is needed to determine the best measure of outcome
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