



**AN ANALYSIS OF MORTALITY FACTORS IN SERIOUS HEAD INJURY CASES AT A TERTIARY HEALTH CENTRE: A CROSS SECTIONAL STUDY**

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**Abstract**

**Background:** Traumatic brain injury has been the world's leading cause of death and disability. Around 1.5 million affected individuals die every year and many million undergo emergency care.

**Aims and Objectives:** Analysis of mortality factors associated with serious head injury in tertiary health care facilities.

**Methodology:** This was a cross-sectional study of patients admitted to the tertiary health center with head injury over the six month period in which we examined 100 patients admitted to our tertiary neurosurgery center with head injury. All data entered in the excel sheet is evaluated by the program Excel Windows 10.

**Result:** We saw in our research that most of the patients were in the 41-50 age group. The bulk of the patients were male. The Glasgow Coma Scale score was 13-14 for the majority of patients. The majority of patients recovered, but in 8 cases, death occurred. The most prevalent related form of injury was 100 percent road traffic accident.

**Conclusion:** From our study, it can be inferred that the majority of patients were in the 40-50 age group, 84 percent of patients improved, and the Time Gap & Low GCS score were factors correlated with death in patients.

**Keywords:** Traumatic brain injury, Glasgow coma scale, road traffic accident.

**Introduction**

Traumatic brain injury has been the world's leading cause of death and disability. Around 1.5 million affected individuals die every year and many million undergo emergency care. Head injury is considered to be a major public health problem, a common cause of death and disability among young people, and a substantial demand for health services<sup>1</sup>. Depending on the adequacy of cognitive rehabilitation, the level of survival after serious and severe head injury is highly dependent. Evaluations of outcomes are typically based on the integrity of neurological activity and offer limited detail on cognitive ability<sup>2</sup>. In developing countries, the mortality of children due to trauma and head injury is second only to congenital illness<sup>3</sup>. Glasgow coma scale (GCS) and computed tomography (CT) scanning have been used since the 1970s to test patients with head injuries. At the tertiary health care centre, we have examined mortality factors associated with serious head injury<sup>4</sup>.

**Material & methods:**

This was a cross-sectional study of patients admitted to the tertiary health center for head injury over the six-month period. In this time 100 head injury patients were admitted to the tertiary neurosurgery unit. Both of them are treated conservatively or through neurosurgical procedures by taking written and clarified consent as per

the standard procedure indications. All patient information such as age, sex, Glasgow comma scale (GCS) admission score, outcome after treatment, and factors correlated with dead patients were evaluated and entered in the excel sheet and analyzed by the program of Excel Windows 10.

**Result:**

The majority of patients were 41-50 years of age (35 percent), followed by 31-40 years of age (25 percent). The majorities of patients were male, i.e. 76%, and 24% were female. 56 percent were the majority of patients with GCS 13-14; 31 percent were followed by 15; 8-12 was 8 percent & < 8 was 5 percent. The majority of recovered patients i.e. enhanced, were 84 percent; 8 percent improved with residual paralysis & 8 percent died. The most common associated factors were RTA injury mode in 100.00 percent; followed by trauma admission time delay > 2 hours in 100 percent; GCS < 8 in 87.5 percent; substance misuse, old age, CVD & Diabetes in 75 percent of cases.

**Table 1: Distribution of the patients as per the age**

Age	No.	Percentage (%)
21-30	12	12
31-40	25	25
41-50	35	35
51-60	18	18
>60	10	10
Total	100	100

**Table 2:** Distribution of the patients as per the sex

Sex	No.	Percentage (%)
Male	76	76
Female	24	24
Total	100	100

**Table 3:** Distribution of the patients as per the GCS

GCS	No.	Percentage (%)
15	31	31
13-14	56	56
8-12	8	8
< 8	5	5
Total	100	100

**Table 4:** Distribution of the patients as per the outcome

Outcome	No.	Percentage (%)
Improved	84	84
Improved with residual paralysis	8	8
Death	8	8

**Table 5:** Distribution as per the associated factors with death in the patients

Associated factors	No.	Percentage (%)
Mode of injury by RTA	8	100.00
<b>Time gap between Trauma to admission</b>		
>2 hr	8	100.00
GCS <8	7	87.5
Alcohol abuse	6	75
Old age	6	75
K/c/o CVD	6	75
K/c/o Diabetes	6	75

## Discussion

One of the most severe forms of injury is traumatic brain injury (TBI). It affects all ages, but most road traffic injuries (RTI) occur in the active age group of young adults. In 2007, 1.4 lakh road accidents occurred with 40,612 people killed and 1.5 lakh people injured, according to a report by the Ministry of Road Transport, Government of India<sup>5,6</sup>. Therefore, because of road deaths, India leads the world in fatalities. Significant socioeconomic losses in India as well as other developing countries are also correlated with TBI. It is a major public health issue worldwide and is expected to overtake many diseases by 2020 as a major cause of death and disability<sup>7,8</sup>. The majority of cases (60%) are attributable to road traffic accidents (RTI), followed by falls (20-25%) and crime (10 percent). Many Asian countries are at increased risk of TBI because of the rapid rise in urbanization, motorization and economic

emancipation<sup>9,10</sup>. Likewise, non-communicable diseases, including accidents, are becoming a leading cause of mortality and morbidity in many low and middle-income countries. Low and middle-income countries face a higher preponderance of risk factors for TBI, although the health care capacity to cope with the associated health consequences is often not efficient<sup>11,12</sup>. Significant TBI-related disabilities also place a significant burden on the health care system in these countries, so awareness of the TBI epidemiological profile and the creation of preventive measures to mitigate this burden are important, particularly in the context of limited resources<sup>13</sup>. In the TBI population, young males are usually affected. Head injury is the leading cause of death in younger people, but it is the most common cause of TBI in older people<sup>14,15</sup>. In head injury patients, there are various factors that decide the outcome, including age, sex, injury severity, intracranial pathology, intracranial pressure and related injuries<sup>16,17</sup>. In our study, we found that the majority of patients were in the 40-50 age group, followed by the 30-40 age group. 76 percent of the patients were male & 24 percent of the females were affected. The GCS score was 13-14 for the majority of patients, followed by a score of 15. The majority of recovered patients i.e. enhanced, were 84%; 8% improved with residual paralysis, but 8% died. The most common associated factors were RTA injury mode in 100.00 percent; followed by trauma admission time delay > 2 hours in 100 percent; GCS < 8 in 87.5 percent; substance misuse, old age, CVD & Diabetes in 75 percent of cases. The highest deaths in the age group of 51 to 60 years were noticed by Yattoo G et al<sup>18</sup> (old age). The overall number of male patients (75.9%) who were admitted to hospital was delayed, i.e. > 2 hours. Improvements in early detection, resuscitation and triage were responsible for better results in serious head injury patients.

## Conclusion

From our research it can be concluded that the majority of patients were in the age group of 41-50 years, the majority of patients improved, i.e. 84%, and the factors correlated with mortality in patients were the time period between admission to trauma > 2 hours; GCS < 8; misuse of alcohol; old age and associated co-morbidities such as CVD and diabetes. In all the instances that died, road traffic collisions were the primary culprit. Significant TBI-related disabilities also place a significant burden on the health care system in these countries, so awareness of the TBI epidemiological profile and the creation of preventive measures to mitigate this burden are important, particularly in the context of limited resources.

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