

SOCIODEMOGRAPHICAL AND CLINICAL PRESENTATION OF TRAUMATIC BRAIN INJURY PATIENTS

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Abstract

Background: Traumatic brain injury (TBI) is a non degenerative, non congenital insult to the brain from an external force, possibly leading to permanent or temporary impairment of cognitive, physical and psychosocial functions with association of diminished and altered state of consciousness. It accounts for approximately 40% of all deaths from acute injuries in the united state. Twenty percent of TBI occurs in the paediatric age young people and men aged about 15-30 are the high risk of population. The study is to define TBI appropriately, to know the causes of TBI, clinical presentations and severity of TBI patients in our hospital.

Methods: A direct observational study was carried out from 18th July, 2010 to 31st December, 2010. Total numbers of patients were 100. A semi structured pretest questionnaire was used to take proper history, clinical assessment, their management and programs.

Results: A total of 100 patients with traumatic brain injury (TBI) in which 84% were male and 16% were female. Out of 100 patients irrespective of sex it was observed that most patients that is 26% belongs to age group 26-35yrs then 24% belongs to age group 16-25yrs. Out of 100 patients 48% was RTA (Road traffic accident) then 28% was assault and 22% belongs to fall in. Out of 100 patients it was observed that most presenting complaints was unconscious 42%, headache 36% and vomiting 26%, mental functions i.e. unconscious 42% and 36% belongs to normal. 42% showed impaired motor and 20% sensory. 62% complaint unable to walk. Bladder dysfunction belongs to 64%.

Conclusion: Traumatic brain injury accounts 40% of all death from acute injuries in the developed country. This percentage is now increasing in developing country like Bangladesh. So government and private organizations should setup more trauma centre and can enhance to decrease the adverse conditions.

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Introduction:

Traumatic brain Injury (TBI) is a non degenerative, non congenital insult to the brain from an external force, possibly leading to permanent or temporary impairment of cognitive, physical and psychosocial functions

with an associated diminished and altered state of consciousness.¹

The Annual incidence of TBI requiring hospitalization and overall is estimated to be 200 and 500 cases respectively; 10, 00000 population in the USA with approximately 1-4

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million receiving urgent care.²⁻⁸ The remaining 20% of the hospitalized new injuries can be evenly divided between moderate and severe injuries.^{9, 10} Male are 1.5 times as likely to sustain and 3 to 4 times more likely to be die from a TBI.^{5, 6, 7, 8, 11}

TBI accounts for approximately 40% of all deaths from acute injuries in the United States. Twenty percent of TBI occurring in the paediatric age among children must (i.e. birth to 17th)⁷ 0-14 yrs. In an estimated 475000 TBIS occurs each year.¹¹ Young people and men aged about 15-30 are the high risk population.¹²

TBI is caused by a severe jolt or blow to the head or a head injury that penetrates and disrupts normal brain function.^{5, 6} Alcohol abuse is the largest indirect cause of TBI.^{13, 14} Auto-pedestrian and bicycle crashes are most common among the children while falls (28th) are most common both children and older adult.^{3, 5, 7, 14, 15} Motor vehicle accident (20%) is the highest among people aged up to 15 to 19 years.

TBI signs and symptoms may sometimes be subtle and might not appear for days or weeks after injury. Some patients may look well, even though they may feel or behave differently.¹⁶ Our brain controls our movements, thought, sensations and behaviors. A TBI can have several different physical and psychological effects. Initial physical effects are bruising and swelling. When injured brain tissue swells up pressure is increased; the injured brain tissue presses against the skull causing additional damage.^{17, 18} Rationale of study to define TBI properly, to know causes of TBI, clinical presentations and severity of TBI patients in our hospital.

Methods:

This direct observational study was performed in department of physical medicine and rehabilitation, Bangabandhu Sheikh Mujib Medical University (BSMMU) and Department of Neurology, Dhaka Medical College Hospital, Dhaka, from 1st July 2010 to 31st December 2010.

A total of 100 patients were included in the study who have traumatic injury with or without injury to the skull or scalp injury aged 5-75yrs. Any patient who has H/O cardiovascular disease (CVD) and congenital neurological disease is excluded in this study.

Assessment and study method:

All the patients were studied with proper history, clinical assessment, their management and prognosis. The data was compiled and coded properly. Numerical data was analyzed statistically.

Ethical consideration:

In the study, the subjects were informed about the nature of the study and written consent was taken. No drugs and other medication were used for trial.

Observations and results:

A total of 100 patients with traumatic brain injury were ultimately included in the study. Eighty four among them were male and sixteen were female. Male to female ratio was 5.25:1. Percentage of male and female were 84 and 16 respectively. Sex distribution of these patients is shown in (Table No. I). The age range of patients in the study varied from aged 5 to 70 years in respective of both sex. Out of 100 patients irrespective of sex it was observed that most patients that is 26 (26%) belongs to age group of 26-35 years, then 24 (24%) belongs to age group of 16-25 years, then 14 (14%) belongs to age group of 36-45 years, then 12(12%) belongs to age group of 5-15 years, then 10 (10%) belongs to age group of 46-55 years (Table no. I). Out of total 100 patients 26 (26%) which is most in number were cultivator, then 22(22%) which belongs to day labour group, then 14(14%) which belongs to student, then 12(12%) which belongs to house wife and service holder (Table no. I). Among 100 patients 54% which are most in number were lower class, then 22% which belongs to lower middle class, then 14% which belongs to upper middle class and 10% which belongs to upper class (Table-I).

Table-I*Distribution of sex/ age/ Occupation/ socioeconomic conditions n = (100)*

	No. of patient	Percentage (%)
Sex		
Male	84	84
Female	16	16
Age group (years)	05-15	12
12		
16-25	24	24
26-35	32	32
36-45	14	14
46-55	10	10
56-65	02	02
>66	06	06
Occupation		
Cultivator	26	26
Day labour	22	22
Student	14	14
Service holder	12	12
House wife	12	12
Businessman	10	10
Others	04	04
Socioeconomic condition		
Lower class	54	54
Lower middle class	22	22
Upper middle class	14	14
Upper class	10	10

Out of total 100 patients 48% which is most in number were RTA, then 28% which belongs to assault, then 22% which belongs to fall and then 2% which belongs to others (Table no. II). Among 100 patients the most presenting complaints was unconsciousness 42%, headache 36%, vomiting 26%, fatigue 24%, and confusion 22% (Table-II).

Table II*Causes and distribution of presenting complaints n = (100)*

	No of patient	Percentage (%)
Causes		
RTA	48	48
Assault	28	28
Fall	22	22
Others	02	02
Complaints		
Unconsciousness	42	42
Headache	36	36
Vomiting	26	26
Fatigue	24	24
Confusion	22	22
Bleeding from ear	08	08
Neck pain	06	06
Bleeding from nose	04	04
Bleeding from eye	04	04
Haematuria	02	02

Out of 100 patients 64% which is most in number were impaired mental function (unconsciousness 42% and confusion 22%), 36% which belongs to intact (Table no. III). Out of 100 patients 42% was not evaluated due to unconsciousness, 14(24.13%) which is most in number were aphasia, then 10(17.24%) which belongs to dysrthria, then 06(10.34%) which belongs to Apraxia and 42% which is most in number was impaired motor function, 58% which belongs to intact (Table no. III). Out of total 100 patients 64% was not evaluated due to unconsciousness (42%) and confusion (22%). 22 (61%) which is most in number was impaired sensory function, 14 (38.89%) which belongs to intact and out of total 100 patients 12 (12%) had spinal fracture, 8 (8%) had limb fracture and remaining 80 (80%) were normal oriented. (Table no. III). 62% which is most in number was unable to walk due to unconsciousness (42%) , spinal fracture (12%) and limb fracture (8%) , able to walk was 38% and 64% which is most in number was impaired bladder functions (Table-III).

Table III
Signs of TBI n = (100)

	No of patient	Percentage (%)
Mental functions		
Impairment	64	64
Intact	36	36
Speech and language disorder		
Aphasia	14	24.13
Dysarthria	10	17.24
Apraxia	06	10.34
Intact	28	48.28
Motor functions		
Impairment	42	42
Intact	58	58
Sensory functions		
Impairment	22	61
Intact	14	38.89
Fractures		
Spinal fracture	12	12
Limb fracture	08	08
Intact	80	80
Gait disorder		
Unable to walk	62	62
Able to walk	38	38
Bladder function		
Impairment	64	64
Intact	36	36

Out of total 100 patients 36% which is most in number were mild, then 50% which belongs to moderate, then 10% which belongs to severe and then 4% which belongs to very severe (Table no. IV).

Table IV
Severity of TBI by GCS scale n = (100)

Grading	GCS	Percentage (%)
Mild	13-15	36
Moderate	09-12	50
Severe	06-08	10
Very severe	03-05	04

Discussion:

Traumatic Brain Injury in detail history and examination should be taken promptly in all age group of people. The assessment of TBI is fundamental to diagnosis, investigation, treatment and rehabilitation. Severity of TBI is typically determined by the initial scores on the Glasgow Coma Scale (GCS), a 15-point scale assessing eye opening, verbalization and command following.¹⁹ An individual who has sustained a mild TBI had an immediate period of altered or loss of consciousness, with GCS score of 13-15 by 30 min post injury. Moderate TBI signifies an immediate period of altered or loss of consciousness for more than 30 min and less than 6 hours GCS score of 9-12. Severe TBI signifies an immediate loss of consciousness without remaining consciousness for more than 6hrs (GCS score 3-8).²⁰ In this study we found, severity of TBI by using GCS scale. Mild (13-15) was 50%, moderate (9-12) was 36%, severe (6-8) was 10% and very severe (3-5) was 4%. From these study moderate TBI patients was more than mild and severe TBI because of many patients with mild TBI may not present to the hospital and the ones who do present may be discharged at the emergency department (ED) without adequate documentation. Severe TBI with associated death at the scene of the accident or during transport to a hospital also may not be accounted for completely in data collection for TBI epidemiologic studies. Men are approximately twice as likely as women to sustain a TBI.²¹ This ratio approaches parity as age increases because of the increased likelihood of TBI caused by falls, for which males and females have similar risks in later life. The male-to-female mortality rate for TBI is 3.4:1.²¹ However the cause-specific ratio for firearm-related injuries is 6:1, while that for injuries related to MVAs (motor vehicle accidents) is 2.3:1. In Bangladesh, from this study men are approximately five times as likely as women to sustain a TBI. The male-to-female ratio for TBI is 5.25:1. This study is dissimilar to Americans study. The risk of suffering a fatal or significant TBI is not randomly distributed within the population. Injury is the leading cause of death among

Americans younger than 45 years; TBI is the major cause of death related to injury. The risk of TBI peaks when individuals are aged 15-30 years. The risk is highest for individuals aged 15-24 years.²¹ In Bangladesh, from this study the highest risk of individuals between 26 and 35 years of age and second highest of individuals aged 16-25 years which is similar to Americans study. Twenty percent of TBIs occur in the paediatric age group (i.e. birth to 17 yrs). The highest mortality rate (32.8 cases per 100,000 people) is found in persons aged 15-24 years. The mortality rate in patients who are elderly (65yrs or older) is about 31.4 individuals per 100,000 people. A second peak of incidence of TBI is recognized in the elderly age group. After the age of 70, the incidence again approaches the extreme rate of the young adult.²² A less pronounced increase risk exist for the infant and very young adult child. In the occupations of the study patients, cultivators 26% were top of the list and then the laborer 22%, student 14%, house wife and service holder 12% and businessman was 10%. However, this classification is arbitrary and vague with overlapping among the occupations. In addition the difference is little. Out of total 100 patients 54% which are most in number were lower class, then 22% which belongs to lower middle class, then 14% which belongs to upper middle class and 8% which belongs to higher class. In this study most of the patients were from lower class 54%. Most of the study subjects came from rural area. This is may be due to poverty situation of our country. Rich people usually take treatment from private clinic and from private doctors. So they are less in the study.²³ In this study, speech and language disorder such as dysarthria, aphasia & Apraxia were 30% due to injury to cerebellum and unconsciousness. Gait disorder was 86% due to sensory impaired 54% and motor impaired 32%. Fracture of different bones of the body specially limb fracture 8% and spinal fracture 12%. Bladder dysfunction is 64% due to unconsciousness, spinal fracture and rupture of urethra by traumatic brain injury.

Conclusion:

Traumatic brain injury accounts 40% of all deaths from acute injuries in the developed country. This percentage is now increasing in

developing country like Bangladesh because socioeconomic condition (low class 54% among the 100 patients) and TRA 48%. Beside these, awareness and transport barrier and emergency treatment is important. If we try to increase awareness, transferred the patient early in the nearest emergency centre can decrease the morbidity and motility in TBI. So government and private organizations should setup more trauma centre and can augment to decrease the adverse conditions.

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