

An Epidemiological Study of Traumatic Brain Injury cases in a Trauma Centre of Bhopal, M.P., India

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ABSTRACT:

Background: The study included all the patients of trauma with clinical/radiological evidence of head injury alone or in association with other injuries admitted to Neurosurgery Unit of Surgery Department, Gandhi Medical College, Bhopal during the period of one year of study.

A data capture form was filled for each of the patient, which included all the details about the case like patient profile, pre hospital care, type of injury, radiological findings, clinical examination, neurological findings and management details.

Result: There were (77%) males and (23%) females. As per literacy status of patients were (53%) Pre-school, (37%) with school education and 10% were graduate and above. Most of the patients were from poor socio-economic strata (61%). Urban population accounted for (39%) in this study.

There were (76%) males and (24%) females. As per literacy status of patients were (43%) Pre-school, (44%) with school education and (13%) were graduate and above. Most of the patients were from poor socio-economic strata (57%). Urban population accounted for (43%) in this study.

Majority (43%) cases of TBI showed some form of local injury on head and neck region among dead whereas in alive (38%). Treatment by surgery after accident Burr Hole (13%), Craniotomy (53%) & Craniectomy (34%).

Conclusion: TBI predominantly affects young male population and most of these are preventable. Early transportation to the hospital and first aid results in good outcome. Mortality increases with the severity of TBI and associated injuries therefore multimodality approach in polytrauma is essential.

Keywords: Epidemiology, Traumatic Brain Injury, Multimodality approach.

Study Designed: Observational Study.

Introduction

Traumatic Brain Injury (TBI) is a major public health problem in India. The increase in economic growth in India coupled with rise in population, motorization and industrialization has contributed to a significant increase in TBI with each advancing year. TBI results in deaths, injuries and disabilities in all age groups but more in young and productive age group persons and higher in males than females.^[1,2] National level data in India is not available for TBI as in many other developed countries. The most common cause of TBI normally reported in our country are road traffic accidents accounting for 60%, followed by falls and assaults contributing to 25%

and 10% of traumatic brain injuries respectively.^[3] The economic losses to India due to TBIs are phenomenal, though unmeasured.

However, despite the increase in TBI burden, research as evidenced by publications in scientific journals pertaining to TBI is grossly inadequate in India. There are no studies in India that have evaluated the publishing strength of medical departments and institutes and the number of articles published by researchers from related disciplines and the scientific impact of these articles. The purpose of our study is to understand the scientific contribution of India in published research of TBI.

Material & Method

The total numbers of patients of head injury admitted in Neurosurgery Unit of Surgery Department of Gandhi Medical College, Bhopal during July 2016 to Dec 2017 were 400. The study included all the patients of trauma with clinical/radiological evidence of head injury alone or in association with other injuries admitted to Neurosurgery Unit of Surgery Department, Gandhi Medical College, Bhopal during the period of one year of study.

A data capture form was filled for each of the patient, which included all the details about the case like patient profile, pre hospital care, types of injury, radiological findings, clinical

examination, neurological findings and management details. TBI severity was scored according to CT scan of brain was done as early as possible. MS office excel sheet is maintained for data. Weekly progress of the study was reviewed. The progress, follow up and their final outcome were recorded by neurological examination.

Data Analysis - Compiled data was collated and analyzed using Microsoft Excel and SPSS 20.0 Data is presented in proportion and mean values. Differences between the two proportions were analyzed using Chi Square test with significant level which was set at <5% error.

Results

Table 1: Demographic profile of TBI patients with their outcome N=400

Parameters	Dead	Alive	P Value
	48 (12%)	358 (88%)	
Sex			
Male	37 (77%)	272 (76%)	0.63
Female	11 (23%)	86 (24%)	
Education			
Pre-school	25 (53%)	154 (43%)	0.04
School	18 (37%)	157 (44%)	
Graduation	5 (10%)	47 (13%)	
Social Status			
Poor Class	29 (61%)	204 (57%)	0.58
Middle Class	15 (32%)	122 (34%)	
Upper Class	4 (7%)	32 (9%)	

Dead patients:

There were (77%) males and (23%) females. As per literacy status of patients were (53%) Pre-school, (37%) with school education and 10% were graduate and above.

Most of the patients were from poor socio-economic strata (61%). Urban population accounted for (39%) in this study.

Alive Patients:

There were (76%) males and (24%) females. As per literacy status of patients were (43%) Pre-school, (44%) with school education and (13%) were graduate and above.

Most of the patients were from poor socio-economic strata (57%). Urban population accounted for (43%) in this study.

Table 2: Treatment Details N=400

Parameters	Dead	Alive	P Value
	48 (12%)	358 (88%)	
Resuscitation done			
Body Parts			
Injured	27 (57%)	222 (62%)	0.02
Head	11 (22%)	97 (27%)	
Face	10 (21%)	39 (11%)	
Surgery Done			
Burr Hole	05 (10%)	47 (13%)	0.27
Craniotomy	28 (58%)	190 (53%)	
Craniectomy	15 (32%)	121 (34%)	

Majority (43%) cases of TBI showed some form of local injury on head and neck region among dead whereas in alive (38%).

Treatment by surgery after accident Burr Hole (13%), Craniotomy (53%) & Craniectomy (34%).

Discussion

In the present study, 89% cases had good outcome. Out of all 90 (11%) operated cases life of 17 (18.89%) cases could not be saved. Bernat JL *et al.*,^[4] based on GOS at 6 months reported improved outcome in 87% cases and mortality was mainly from severe head injuries. However severe brain injury is major predictor of unfavorable outcome in patient with multiple injuries.

As per duration of hospital stay we found that 40% of total deaths occurred within 48 hours of injury and other 37% deaths were reported between 2-7 days. So first 48 hours are very crucial for TBI cases and majority of severe TBI cases die during this period. Later due to various secondary complications next significant period is 1 week.

Gabela B, *et al.*, used a state surveillance system to identify cases of TBI.^[5] The study showed higher rates of severe TBI in rural as compared to urban areas. In our study predominant (78%) cases were from the urban areas and rest 22%

cases were from rural background. Densely populated urban areas outnumber TBI cases compared with rural background due to better facilities for basic amenities like jobs, educational institutes and better residential facilities etc.

TBI is possible through environmental improvements and legislative changes. TBI is a significant public health problem worldwide and requires appropriate attention from researchers and policy makers regionally through the development of ongoing surveillance programs and the implementation of effective evidence-based interventions.^[6]

In India injury patterns/modes are different from the developed nations. We are in a fast transient phase of development with a wide gap between large poor population and rich people. The present health infrastructure is not able to meet the demand of common people, further aggravated with the ever expanding slum population in urban areas. Prevention of injury and care of injury is a multidisciplinary area and requires inter-sectoral coordination for planning.^[7]

By improving our system with better reporting and documentation of cases, we will be able to make a better plan to decrease the incidence of TBI and their timely appropriate multimodality

approaches to achieve better outcome of these cases within our limited resources.

Conclusion

TBI predominantly affects young male population and most of these are preventable. Early transportation to the hospital and first aid results in good outcome. Mortality increases with the severity of TBI and associated injuries therefore multimodality approach in polytrauma is essential.

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