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PROSPECTIVE OBSERVATIONAL STUDY OF MODERATE AND SEVERETRAUMATIC BRAIN INJURY IN A TERTIARY CARE HOSPITAL

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Abstract

Introduction: Traumatic brain injury (TBI) is a major burden with approximately 10 million annual victims reported on the health care system throughout the world. TBI is defined as 'an alteration in brain function, or other evidence of brain pathology, caused by an external force'. A severe TBI is defined by a Glasgow coma score (GCS) score of 8 or less during the first post traumatic day.

Materials and Methods: This prospective study was conducted at Kurnool Medical College & GGH, Kurnool during the period of 6 months from August 2022 to January 2023. All consecutive Patients of moderate and severe traumatic brain injury (GCS <12/15) admitted at Department of Neurosurgery, Kurnool Medical College, Kurnool Were enrolled for this study. The patients who were brought dead or had a GCS of more than 13/15 were not included in this study. Similarly, due to restrains of manpower, those patients who were not admitted or transferred in department of surgery were not included in this study.

Results: 4.5% of all cases were victims of road accident. The mean value of hospital stay (Days) of moderate head injury patient was 7.37 days vs a mean stay of 9.2702 days for those who had severe head injury. A total of 245 consecutive cases were recorded from August 2022 to January 2023. 121 cases (49.38%) got classified as moderate head injury with GCS score of 9-12 and remaining 124 cases (50.61%) as severe head injury cases with GCS score of 8 or less. As compared to previous data from this institute, the cases of moderate head injury admitted at GGH is steadily increasing from 61 in 2021 to 121 in 2023. Similarly the cases of severe head injury admitted has increased from 37 in 2021 to 124 in 2023.

Conclusion: The cases of head injury admitted at GGH, Kurnool is rapidly increasing since past 5 years. The increase is seen in serious head injury cases with GCS < 13/15. There is no variation in the incidence in different months of year and road accident remains the most common mode of injury in all ages. Most vulnerable population is males in the age group of 21-50 yrs. Orthopaedic injuries are the commonly associated injuries especially fracture of lower limbs. Alcohol consumption prior to trauma is seen in >31% of victims. Though more than 55%

patients show improvement with adequate medical and surgical treatment, a mortality of more than 27% was observed.

Key Words: Traumatic brain injury, Glasgow coma score, Orthopaedic injuries.

INTRODUCTION

Traumatic brain injury (TBI) is a major burden with approximately 10 million annual victims reported on the health care system throughout the world.[1] TBI is defined as 'an alteration in brain function, or other evidence of brain pathology, caused by an external force'. A severe TBI is defined by a Glasgow coma score (GCS) score of 8 or less during the first post traumatic day.[2]

It is a neurosurgical emergency and timely intervention is critical for favorable outcome. In addition to the impact of TBI on the individual, it can negatively impact families, communities, and the economy.[3] Its outcome prediction is paramount in clinical decision making, counselling relatives and targeted use of limited healthcare resources in developing countries like India.[4]

Although several prognostic models have been developed, the accurate assessment of short term and long-term prognosis of severe TBI needs further evaluation. A number of factors are believed to influence the outcome of TBI patients including age, gender, GCS, intracranial pressure (ICP), pupillary size and responsiveness, hypoxia, computerized tomography (CT) findings and type of treatment (operative or non-operative).[5]

The main aims of present study is to study of the aetiology of head injury patients and study the burden of this epidemic on society and hospital resources in terms of days of hospitalization, morbidities and mortalities.

MATERIALS AND METHODS

This prospective study was conducted at Kurnool Medical College & GGH, Kurnool during the period of 6 months from August 2022 to January 2023.

Inclusion Criteria: All consecutive Patients of moderate and severe traumatic brain injury (GCS <12/15) admitted at Department of Neurosurgery, Kurnool Medical College, Kurnool Were enrolled for this study.

Exclusion Criteria: The patients who were brought dead or had a GCS of more than 13/15 were not included in this study. Similarly, due to restrains of manpower, those patients who were not admitted or transferred in department of surgery were not included in this study.

The data was collected in tabulated excel sheet regarding various parameters like, patient age, sex, cause of injury, associated injuries in addition to head injury, consumption of alcohol, surgical or medical treatment given, days spent in ICU or ventilator, outcome at the time of

discharge, etc. outcome was assessed on simple scale of GCS 15/15, less than 15/15 or death at the time of discharge.

RESULTS

4.5% of all cases were victims of road accident. The mean value of hospital stay (Days) of moderate head injury patient was 7.37 days vs a mean stay of 9.2702 days for those who had severe head injury. A total of 245 consecutive cases were recorded from August 2022 to January 2023. 121 cases (49.38%) got classified as moderate head injury with GCS score of 9-12 and remaining 124 cases (50.61%) as severe head injury cases with GCS score of 8 or less. As compared to previous data from this institute, the cases of moderate head injury admitted at GGH is steadily increasing from 61 in 2021 to 121 in 2023. Similarly the cases of severe head injury admitted has increased from 37 in 2021 to 124 in 2023.

Age group	Males (total=195)	Females (total=50)
0-10	13	4
11-20	23	5
21-30	60	6
31-40	40	10
41-50	31	15
51-60	16	7
>60	12	3

Table 1: Age and Gender distribution

Age group	RTA	Fall from height	Assault	Animal injury	Other	Total
0-10	11	5	1	0	1	17
11-20	21	1	2	2	2	28
21-30	45	7	7	1	6	66
31-40	40	5	2	1	2	50
41-50	36	4	4	0	2	46
51-60	18	0	3	0	2	23
>60	10	3	1	1	0	15

Table 2: Causes of Head Injury in Different Age Groups

Time Interval	Cases (N=245)	Percentage
<12 hours	201	82.2
12-24	14	5.6
>24 hours	30	12.2

Table 3: Time interval between injury and admission

	Moderate	Severe
Cases Directly Admitted	51	52
Cases Referred	70	73

% of Cases Reaching by Referral	57.85%	57.66%

Table 4: Distribution of Cases Admitted Directly or Referred from Other Hospitals According to Glasgow Coma Score

Alcohol Intake Prior to Trauma	Moderate (121)	Severe (124)
78(31.83%	32 (26.33)	46 (37.5%)

Table 5: Presence of Alcohol in Head Injury Patients at the Time of Admission

	Moderate (121)	Severe (124)	Total (245)
Conservative	85 (70.66%)	81 (65.73%)	167 (68.16%)
Surgery	35 (29.34%)	42 (34.27%)	78 (31.83%)

Table 6: Relationship of GCS Score and Neurosurgical Intervention

DISCUSSION

It is estimated that the total cost of road traffic injuries alone is about 3% of GDP in India. The epidemiological study undertaken in Bangalore has revealed that the incidence was 150/1,00,000, mortality rate was 20/1,00,000 and case fatality rate was 10%, respectively.[6]

The overall male /female ratio was 3.9 with maximal difference in the 3rd decade being 10.9. This is reflection of the male female ratio of the society in general and also mostly males are driving the vehicle or busy with outdoor activities.[7]

In all age groups, road accident was the most common mechanism of injury, followed by fall from height and assault respectively. 74.5% of all cases were victims of road accident. There were no event of mass causality or suicidal cases during this study period. Other rare causes were fall from train or bullock cart, hit by animals on road or fields and sports related injury or fall at home. The peak incidence of injury occurred in 3rd decade followed by 4th and 5th decades. 65.9% of all cases were from the age of 21-50 years.[8]

More than 82% of victims could reach hospital within 12 hours of injury. More than 57% of patients had received treatment at some hospital before being referred to GGH, Kurnool for necessary care. The cause for referral was mostly lack of adequate facilities including availability of neurosurgeon. Poor Financial condition was the other cause for referral.[9]

An alarming no of 31.82% of victims/ attendants confessed the consumption of alcohol intake shortly before injury. More than 37% of severe head injury patients had consumed alcohol shortly before event. This highlight the strong correlation of drunken driving with moderate /severe head injury.[10]

CONCLUSION

The cases of head injury admitted at GGH, Kurnool is rapidly increasing since past 5 years. The increase is seen in serious head injury cases with GCS < 13/15. There is no variation in the incidence in different months of year and road accident remains the most common mode of injury in all ages. Most vulnerable population is males in the age group of 21-50 yrs. Orthopaedic injuries are the commonly associated injuries especially fracture of lower limbs. Alcohol consumption prior to trauma is seen in >31% of victims. Though more than 55% patients show improvement with adequate medical and surgical treatment, a mortality of more than 27% was observed.

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