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Scenario of Head Injury Patients in Tertiary Care Hospital of Nepal

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ABSTRACT

Background: The aim of the study is to find out the age and sex distribution, modes of head injury and correlate Glasgow Coma Scale with Computed Tomography in patients with head trauma in our center.

Methods: A cross-sectional study was performed among 113 patients of acute head trauma presenting to Emergency department of our hospital for three months. The severity of the head injury was assessed on admission by the Glasgow Coma Scale score and categorized as mild, moderate, or severe head injury. Non contrast head computed tomography was obtained.

Results: The mean age of patients studied in this study was 35.53 year in males and 32.1 year in female with male to female ratio being 1.86:1. The most common causes of head injury were road-traffic accident 58 (51%), falls 42 (37%) and physical assault 13 (12%). In our present study, 67 (59.3%) of patients had mild head injury, 27 (23.9%) had moderate head injury and 19(16.8%) had severe head injury. Our study shows presence of multiple lesions with depressed bone fracture of skull bone was associated with lower Glasgow Coma Scale. Significant association between Glasgow Coma Scale and computed tomography finding was seen ($p<0.001$).

Conclusions: Glasgow Coma Scale is strongly associated with computed tomography in patients with head injury. Road traffic accident is the commonest mode of injury. Most present with mild head injury.

Keywords: Computed tomography; Glasgow coma scale; head injury

INTRODUCTION

Head is most commonly injured organ, which sustains primary impact causing significant morbidity and mortality. Head trauma ranks as a major cause of mortality and mortality in more than 50% of affected individuals.[1,2] and even after 10-20 years post injury.[3] Any head injury patient presenting to emergency is initially assessed by Glasgow Coma Scale(GCS). GCS access three domains: Eye opening, Verbal response and Motor response. GCS scoring is used to grade head injury as mild, moderate and severe head injury. Published studies shows that 50-60% patients have mild, 25-30% have moderate and 15-20% have severe head injury at presentation to emergencies.[4-6]

Computed Tomography (CT scan) has become one of the primary modes of investigation in head trauma patients. CT findings, like mass lesion with compression of cisterns, depressed skull bone fractures, midline shift of 5mm and traumatic sub-arachnoid hemorrhage (SAH), are considered as poor prognostic markers in cases of head injury.[7] The aim of the study was to highlight the scenario of head injury patient presenting in tertiary care hospital and correlate Glasgow coma scale with computed tomography.

METHODS

The study was done after approval from Ethical Committee in the Upendra Devkota Memorial National Institute of Neurological and Allied Sciences. This cross-sectional study was done in the department of Neurosurgery from June 1, 2019 to August 31, 2019. Total of 113 patients with head trauma were included in our study after taking consent. All cases of head trauma within 24 hours of presentation were studied except patients with history of previous stroke, use

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of anticoagulants and bleeding disorders, which were excluded.

Detailed history taking and examination of nervous system was done. Injuries involving other systems of the body were noted. After initial assessment, head trauma was graded with the help of GCS as follows: Mild Head Injury: 13-15, Moderate Head Injury: 9-12 and Severe Head Injury: less than or equal to 8. Specific note of GCS, CT scan finding, any co-morbidities of the patient including their drug history, mode of trauma and verbal confirmation regarding alcohol intake was made. The modes of trauma were divided as road traffic accident, fall injury, pedestrian injury and physical assault. Then, the patients were scanned with CT scan in a supine position. The scan was recorded from base of skull to vertex of head. Brain window, Bony window along with 3D constructed images was studied.

Microsoft Excel spreadsheet – 2007 and its data analysis tool were used for data analysis. Chi-square test was used to establish correlation between GCS and CT scan findings and independent sample t-test was used to study number of lesions and depressed bone fracture with mean GCS. P value of less than 0.05 was considered significant.

RESULTS

A total of 113 patients of head trauma(after exclusion) during the period of three months were studied. Among them 73 were male and 40 were female with male to female ratio of 1.86:1 (Table 1).

Table 1.Sex distribution of cases.

Sex	Total number of cases	Percentage
Male	73	65
Female	40	35
Total	113	100

Similarly, our study demonstrates that both male and female of age group 21-30 has maximum number of head trauma patients followed by patient of age group 0-10 years of age (Table 2).

Table 2. Age and Sex distribution of cases.

Age (years)	Male		Female		Total	
	No	%	No	%	No	%
0-10	10	13.7	10	25	20	17.7
11-20	6	8.2	4	10	10	8.85
21-30	19	26	7	17.5	26	23.04
31-40	8	11	4	10	12	10.61
41-50	11	15	5	12.5	16	14.15
51-60	9	12.3	3	7.5	12	10.61
61-65	2	2.8	4	10	6	5.31
>65	8	11	3	7.5	11	9.73
Total	73	100	40	100	113	100

In our study, Road traffic accident accounts for majority of cases (51%) in our study followed by fall injury(37%). (Figure 1)

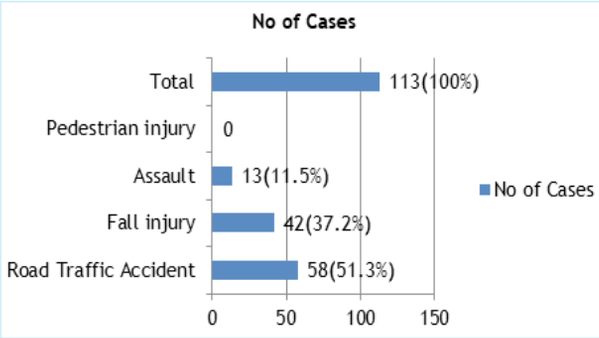

Figure 1. Graphical representation of incidence of modes of injury.

The grading of head injury patients according to GCS shows that the maximum number of patients had mild head injury followed by moderate and severe head injury (Table 3, Figure 2).

Table 3. GCS and Head injury patients.

Type of Head Injury	GCS	No of cases	Percent
Mild Head Injury	13-15	67	59.3%
Moderate Head Injury	9-12	27	23.9%
Severe Head Injury	<8	19	16.8%
Total		113	100%

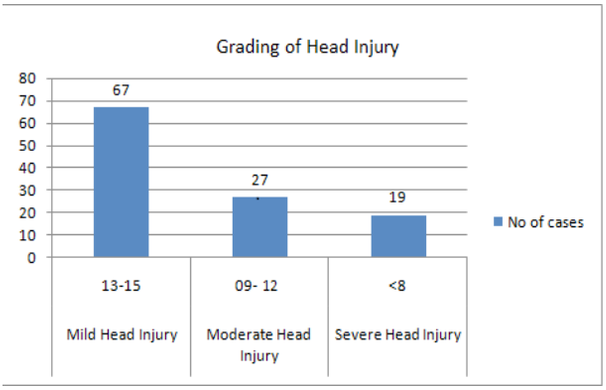

Figure 2. Graphical presentation of grading of head injury.

The mean GCS of single lesion cases and multiple lesion

cases were 13.571.66 and 12.551.69 respectively. The mean GCS of cases with multiple lesion and depressed bone fracture was 9.291.74. As the p value is less than 0.001, the mean GCS was statistically significant. In our study, it was found that with the increase in lesion and presence of bone fracture, there is decline in GCS of patients (Table 4).

Table 4. Grading the lesion based on GCS.

CT Findings	Number of cases	Mean GCSSD	P value
Single lesion	62	13.571.66	<0.001
Multiple lesion	34	12.551.69	<0.001
Multiple lesion + depressed bone fracture	17	9.291.74	<0.001

DISCUSSION

GCS score and CT scan findings play an important role for treatment of head trauma patients. In many head trauma patients, lesions like hematoma causing mass effect and brain herniation may take place. This can lead to significant disability in an individual.[5] GCS gives information about severity of injury and it is one of the prognostic markers of cognitive recovery and functional outcome. It also predicts the extent of parenchymal change.[8]

Our study shows that the ratio of male to female cases is 1.86. Brain Injury Statistics based on United Kingdom Admissions 2016-2017, states that males are 1.5 times more likely to present to emergency for head trauma.[9]

In our study it is found that 23 % cases were of 21-30 age group followed by 17.7% cases of 0-10 age group and 14.15% cases of 41-50 age group. The incidence of head trauma as shown by one of the published study is 30% in 0-25 age group, 60% in 25-58 age group and 10% in 58+ age group.[10] The variability in finding may be due to reasons that this is a single center study, it does not represent all population , and the catchment area of the study center.

Our study shows 51.3% cases accounts for RTA and 37.2% accounts for fall injury. Road traffic accident (RTA) (65%) was the most common mode of injury, followed by fall on level ground (13.5%), fall from height (6.3%), work place injuries (6.3%), and others.[11] Systematic review and meta-analysis done by Peeters W *et al*[12] also shows that road traffic accident and fall injury are the major causes of head injury in European population. Similarly, a multi-center study in China shows that road traffic accident followed by fall injury and physical assault are common causes of traumatic head injury.[13]

In our study, we have considered low GCS as a significant risk factor in association with significant CT scan findings. Patients with multiple lesions and depressed bone fracture had low GCS than patients with single lesion. Mild head injury patients have GCS of 13-15, moderate head injury patients with GCS 11-13 and severe head injury patients with 8-9. Thus, it can be said that with increase in severity of head injury, there is reduction of GCS score.

The limitations of our study are smaller sample size, single center based study and shorter duration of study. Multi-center studies with larger sample size and over a longer duration are required to explain the nature of head injury for the larger catchment area.

CONCLUSIONS

Glasgow Coma Scale is strongly associated with computed tomography in patients with head injury. Glasgow Coma Scale is a useful tool to triage the level of severity of injury. Road traffic accident is the most common mode of injury. Most patient present to the emergency department with mild head injury.

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