

## Family Disruption as a New Prospect to Consider in Traumatic Brain Injury.

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**Background:** Different types of behavioral changes are seen in head injury patients, and these changes are directly or indirectly related to the daily activities of both patient and the family members. The impact of head injury has affected the relationships in the family and friendship status too. Even it has brought about divorce and other family disruption in the present modern world. This study was designed with the aim of evaluating family disruption in different grades of head injury. **Materials and methods:** This is a prospective analytical study that included 76 patients with non-probability consecutive sampling conducted at the National Institute of Neurological and Allied Sciences, Bansbari, Nepal over 6 months duration. All head-injured patients above the age of 16 years were included and patients with Extended Glasgow Outcome Scale of less than 3 at 6 months follow up were excluded. Their age, gender, mode of injury, GCS at presentation were collected. Extended Glasgow Outcome Scale and their family adjustment were evaluated at 6 months. The family adjustment was seen and analyzed from the GOS-E interview questionnaire. Data analysis was done using SPSS v.20. **Results:** The total number of patients was 76 among which 71% were below 40 years of age and the majority (87%) were males. The commonest mode of injury was a road traffic accident (35, 46%) followed by injury due to fall and physical assault. Of all, 76% (58/76) were mild head injured followed by 15% (11/76) severe head-injured patients. At 6 months, the Extended Glasgow Outcome Scale (EGOS) of 7 and 8 were obtained in 37% and 43% of the patients respectively. All the family who had severe head-injured patients and about 85% of the family with moderate head-injured patients had a significant degree of family disruption. Also, 8% of families with Mild head-injured patients had some degree of family disruption. Family disruption and its extent of severity were significantly related to the severity of the head injury. **Conclusion:** Family disruption and extent of disruption/ strain are also strongly associated with the severity of the head injury.

**Key words:** Extended Glasgow Outcome Scale, Family Adjustment, Neurobehavioral Rating Scale, Traumatic brain injury.

Traumatic brain injury (TBI) is one of the major causes of presentation to a neurosurgical center. Among all causes of head trauma, a road traffic accident is the major cause of traumatic brain injury.<sup>1</sup> And, it is the most common cause of death especially in the age group of 1-24 years.<sup>2</sup>

Although major alterations of personality after head trauma are generally confined to severe

injury,<sup>3-6</sup> post-concussional symptoms like headaches, dizziness, fatigability, difficulty in concentration and memory and associated emotional distress may frequently persist for at least 1 to 3 months following minor head injury.<sup>7-9</sup> These symptoms, however minor, could nonetheless have long term psychosocial implications.

Administration of structured interviews and rating scales to relatives has elucidated the diversity of behavioral sequel exhibited by head-injured patients in various situations and the psychiatric repercussions imposed on family members.<sup>4,10,11</sup> This study was designed with the aim of evaluating family disruption in different grades of head injury.

### Methods and Materials:

Study design: Prospective analytical study

Site of study: National Institute of Neurological and Allied Sciences, Bansbari, Kathmandu, Nepal.

Sampling technique: Consecutive non – probability sampling technique

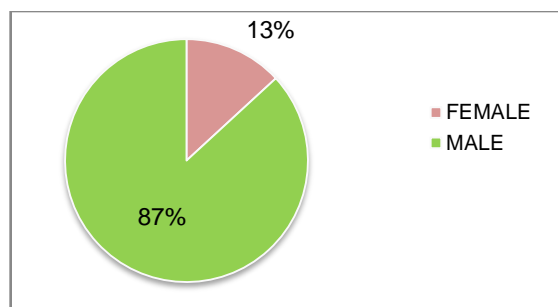
Inclusion criteria: All head-injured patients above the age of 16 years.

Exclusion criteria: Extended Glasgow Outcome Scale of less than 3 at 6 months follow up.

Data Collection and Analysis: All patients above the age of 16 years with traumatic brain injury were enrolled in the study. Their age, gender, mode of injury, GCS at presentation were collected. Extended Glasgow Outcome Scale along with their family adjustment was evaluated at 6 months and all those patients with EGOS < 3 were excluded from the study. The family or friendship disruptions due to psychological problems were carefully noted during the interview in conjunction with a neurobehavioral assessment. The extent of disruption was further categorized into occasional, frequent, and constant as classified in the GOS-E. Data analysis was done using SPSS v.20. The frequencies were calculated for age, gender, mode of injury, the severity of the head injury, GOS-E. Similarly, the chi-square test or Fisher exact test where applicable were used to see the association of age, gender, mode of injury, the severity of the head injury, and GOS-E with the different extent of familial disruption.

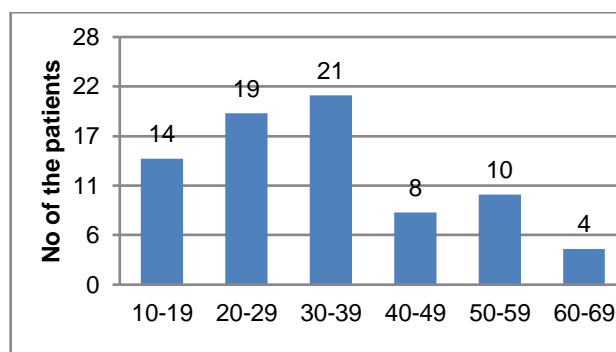
### Results:

The total number of patients was 76 in this study. Among this study population, there were predominant males (66, 87%) compared to counterpart females (10, 13%) (**Figure 1**).



**Figure 1: Gender distribution**

In this study, most of the patients who sustained head injury were aged between 20 to 39 years which is 52.6% of the total sample, followed by aged between 16 to 19 years (18.4%) (**Figure 2**).



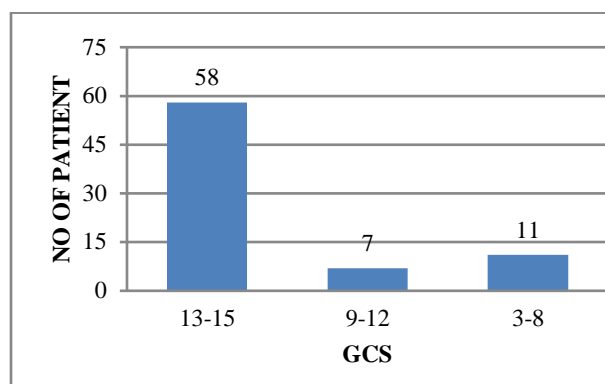
**Figure 2: Age distribution**

The most common mode of head injury was RTA (35, 46%), followed by injury due to fall (21, 28%) (**Table 1**).

**Table 1: Mode of Injury**

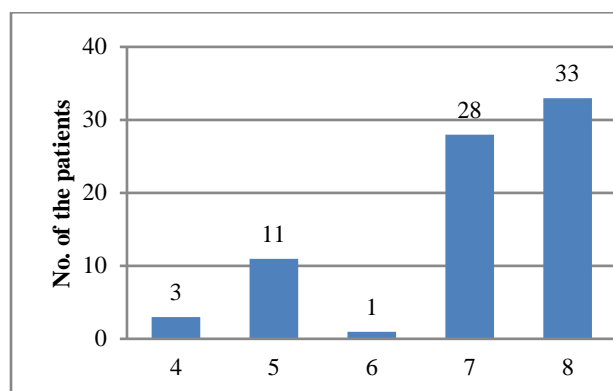
Mode of Injury	Frequency
RTA	35 (46%)
Fall Injury	21 (28%)
Physical Assault	15 (20%)
Others	5 (6%)

Most of the study population had a mild head injury (58, 76%); however, there were 7(9%) of moderate and 11(15%) of severe head-injured patients (Figure 3).



**Figure 3: Frequency of Head injury grades**

Though the majority of head-injured patients had GOS-E of seven (28, 37%), and eight (33, 43%), however, there were 15 (20%) patients with GOS-E of  $\leq 6$ .



**Figure 4: GOS-E at Six Months**

Family or friendship disruption due to psychological problems was significantly associated with the severity of the head injury. Similarly, the extent of family disruption/ strain which was graded as occasional, frequent, and constant was also significantly associated with the increasing severity of head injuries. Even in mild head injury, the family or friendship disruption was noted, though it was only 8.6% of occasional type. The frequency of constant disruption increased from 14.3% in a moderate head injury to as high as 72.7% in severe head injury.

**Table 15: Family disruption in different head injury grades**

GCS Category	Family disruption		Total	P-Value
	Yes	No		
13-15	5	53	58	<b>0.000*</b>
9-12	6	1	7	
3-8	11	0	11	
Total	22	54	76	

**Table 16: Extent of family disruption or strain in head injury grades**

GCS Category	Extent of disruption/ strain				Total	P-Value
	No	Occasional	Frequent	Constant		
13-15	53	5	0	0	58	<b>0.000*</b>
9-12	1	1	4	1	7	
3-8	0	1	2	8	11	
Total	54	7	6	9	76	

### Discussion:

We all are well aware of neurological disabilities following a head injury, where patients are left with obvious paralysis. However, the neurobehavioural problems and its impact on

family adjustment are often neglected in terms of rehabilitation, has a greater impact on the individual, family, and society. Furthermore, these neurobehavioral disabilities have got rather long-term sequelae as compared to physical disabilities. Clinician based instruments allow a trained clinician or psychometrician to make objective assessments of operationally defined classes of behavior.

As noted by most of the literature in head injuries,<sup>12,13</sup> this study also had similar gender distribution, where male patients were predominant (87%). And these findings may be due to the male predominance in motor vehicle handling in this part of the world. Similarly, age ranged 20 to 40 years, was more vulnerable to the trauma in this study which was consistent with the standard papers in head injuries.<sup>12,13</sup>

As it is obvious, the road traffic accident had already overshoot the prevalence compared to the other mode of injuries like physical assaults, fall, etc., and the severity of the injuries is also becoming more with this type of accident.<sup>12,14</sup> The obvious query of the patient's family member or the caretaker in cases of head injury is the prognosis in terms of outcome. The extended Glasgow Outcome Scale had somewhat tried to overcome this problem, in predicting their outcome in terms of severity of the initial head injury. It classifies the outcome into eight different categories, ranging from 'dead to upper good recovery.' In the series of Mazaux JM et al<sup>13</sup>, they have found 91% of mild head-injured patients had good recovery in terms of Glasgow Outcome scale, similarly, 89.28% of moderate head injury had good recovery; however, only 40.74% of severe head-injured patients had good recovery; and 44.44% and 14.81% had a moderate disability and severe disability respectively.

In our study, despite excluding the patients with GOS-E of  $\leq 3$ , the majority of head-injured patients had GOS-E of seven (28, 37%), and eight (33, 43%). However, there were 15 (20%) patients with GOS-E of  $\leq 6$ .

The outcome of a head injury patient is not only related to the patient's physical outcome but in fact, it has got a direct effect on their family. So, the questions of family or friend disruption due to

psychological problems and the extent of disruption or strain tries to explain these few quires. Mazaux JM et al<sup>13</sup> had tried to see the association of social autonomy of the patient with neuropsychological impairment, and he found them to be highly significant in all the categories like mobility outside the home, going out for shopping, using public transport, writing letters, financial management, administrative tasks, return to work, and need mental assistance. As similar to past studies, our study has shown a significant relationship between family disruption and the extent of family disruption/ strain with the severity of the head injury.

### Conclusion:

Family disruption and extent of disruption/ strain are also strongly associated with the severity of the head injury. Therefore, proper family counseling and rehabilitation is a very important part of the management of traumatic brain injury. Also, the social security for left-over and neglected severely head-injured patients should be secured by the government.

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