International Surgery Journal
Pusdekar V et al. Int Surg J. 2018 Oct;5(10):3252-3255
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: http://dx.doi.org/10.18203/2349-2902.isj20184071

Original Research Article

Study of cases of head injury in a government hospital in rural Indian setting

Vinod Pusdekar, Sandeep Ambedkar*, Ritesh Bodade

Department of Surgery, Government Medical College, Gondia, Maharashtra, India

Received: 25 August 2018
Accepted: 04 September 2018

***Correspondence:**
Dr. Sandeep Ambedkar,
E-mail: drsandeepambedkar@yahoo.com

ABSTRACT

Background: Head injury can be defined as trauma in which the head is struck or moves violently, resulting in transient or permanent alteration of consciousness of an individual. We profiled and analyzed the cases of head injuries reporting to a government hospital a rural Indian setting.
Methods: All the patients with history of antecedent head injury were firstly assessed by detailed history, with emphasis on history of unconsciousness/vomiting/convulsions/ENT bleed. Then a thorough clinical examination was undertaken, including Glasgow Coma Scale (GCS) scoring. Further, all the patients were subjected to CT scan of head for correlation of clinical findings, confirmation of diagnosis, delineation of extent of disease and suitability of operative intervention etc.
Results: Majority of the patients belonged to 15-44 years age group (30, 60%) and were males (38, 76%). Road traffic accidents accounted for majority (38, 76%) of the cases. GCS score was found to range between 13-15 (mild) in 18 (36%) patients, 9-12 (moderate) in 21 (42%) patients and 3-8 (severe) in 11 (22%) patients. Best recovery (88%) was shown by patients of GCS score between 13-15. Among the critical symptoms and signs, unconsciousness and abnormal plantar reflex were the commonest ones. Generalized cerebral edema without associated lesion (50%) was the commonest finding followed by extradural hematoma (EDH) (40%) on CT scan of head. As for recovery w.r.t. CT scan findings, highest rate of recovery (100%) was reported in patients with fracture without intracranial pathology, while highest mortality was reported in those having mixed lesion (90%).
Conclusions: Road traffic accidents in young age group is the commonest mode of head injury and GCS score is a good predictor of recovery in head injury cases.

Keywords: Glasgow Coma Scale, Head injury, Road traffic accident

INTRODUCTION

The world is getting urbanized rapidly. Along with other changes, urbanization incorporates a shift towards rapid modes of transport, which brings along its own set of issues. It has sadly resulted in increase in grave physical injuries. Out of it, craniocerebral trauma is the leading contributor to mortality. Head injury can be defined as damage to the brain resulting from external mechanical force, such as rapid acceleration or deceleration, impact, blast waves, or penetration by a projectile.[1] Vehicular accidents, fall from height and assault are commonly reported modes of head injury. The variables related to head injuries in rural areas are absence of helmets, poor training to the drivers, poor road conditions, poor vehicular maintenance and driving under influence etc.[2] It has also interested researchers world over to study the predictors of outcome after head injuries.[3-5] Glasgow Coma Scale (GCS) is probably the most widely used for the above purpose.[6] Nonetheless, the bedside clinical

indicators like GCS are not fairly accurate. Now newer imaging significantly methods add to the armamentarium of the treating surgeon. With this study, an attempt was made to profile and analyze the cases of head injuries reporting to a government hospital a rural Indian setting.

METHODS

Present study was an observational study carried out at Government Medical College and KTS Hospital, Gondia for a period of one year and 6 months.

Study population included all the cases of head injury referred for surgery during the study period. All the patients with history of antecedent head injury were firstly assessed by detailed history, with emphasis on time, place and mode of injury along with recording of history of unconsciousness/vomiting/convulsions/ENT bleed.

Then a thorough clinical examination was conducted as per a pre-tested and validated proforma. Further all the patients were subjected to CT scan of head for correlation of clinical findings, confirmation of diagnosis, delineation of extent of disease and suitability of operative intervention etc. other routine investigations were undertaken in select patients, as indicated for further management.

Glasgow Coma Scale (GCS) was used to assess the level of consciousness.[6] It includes three responses viz. eye opening, best motor response and best verbal response. Accordingly, the cases were given a composite GCS score, classifying them as either mild (13-15), moderate (9-12) or severe (3-8).

A total of 50 patients needed operative intervention and were referred for further surgical intervention to specialty referral centre and were considered for analysis. Written informed consent was elicited from all the participants/1st degree relatives for enrollment in the study. The study was duly approved by the Institutional Ethics Committee.

RESULTS

The present study included 50 patients of head injury who were enrolled and studied during the mentioned study period of one and a half year.

Table 1: Glasgow Coma Scale (GCS) score and outcome.

GCS Score	Number of cases	Recovery		Mortality	
		No.	%	No.	%
13-15	18 (100%)	16	88	2	12
9-12	21 (100%)	15	71	6	29
3-8	11 (100%)	2	18	9	82

Majority of the patients (30, 60%) belonged to 15-44 years age group, followed by 45-70 years (11, 22%) and 2-14 years (9, 18%) age groups respectively. Male patients (38, 76%) outnumbered female patients (12, 24%) by a preponderance ratio of 3.16:1. Road traffic accidents accounted for as many as 38 (76%) cases of head injury; with fall from height and assault by someone contributing 7 (14%) and 5 (10%) cases respectively. Out of the 38 cases of road traffic accidents, 30 (78%) were travelling by two-wheeler and 5 (13%) by three-wheeler, while 3 (9%) were pedestrians hit by some other vehicle.

Table 2: CT scan findings and incidence of symptoms and signs.

Finding on CT scan	No. of cases	Symptoms				Signs		
		Unconscious-ness	Vomiting	ENT Bleed	Convulsion	Abnormal Plantar Reflex	Abnormal Pupillary Reflex	Brady-cardia
Gen cerebral edema	25	15	8	5	1	15	10	1
EDH	20	15	6	5	-	10	8	1
SDH	12	8	5	3	1	7	5	1
Mixed lesion	10	8	6	2	1	5	7	1
Fracture w/o intra-cranial pathology	8	3	1	2	-	1	3	-
Contusion	6	4	2	1	-	3	2	-
Intracranial haemorrhage	3	3	1	1	-	2	3	1

Glasgow Coma Scale (GCS) score was found to range between 13-15 (mild) in 18 (36%) patients, 9-12 (moderate) in 21 (42%) patients and 3-8 (severe) in 11 (22%) patients at the time of admission. Patients of GCS score 13-15 showed recovery in 88% of cases, those with scores of 9-12 recorded recovery in 71% cases, while

patients with GCS scores between 3-8 had recovery in only 18% cases (Table 1).

As for recovery across different age groups, there was 78% recovery in 2-14 years age group, 73% recovery in 15-44 years age group and 64% recovery in 45-70 years age group. Males (65% recovered) and females (66%) had similar rates of recovery. In total, 17 (34%) deaths were reported, while 33 (66%) patients showed recovery.

With respect to CT scan findings, generalized cerebral edema without associated lesion (50%) was the commonest finding, followed by extradural hematoma (EDH) (40%), subdural hematoma (SDH) (24%), fracture without intracranial pathology (6%) and mixed lesions (20%), among other findings. Among the critical symptoms and signs, unconsciousness and abnormal plantar reflex were the commonest ones, as detailed in Table 2.

Table 3: Type of CT scan finding and associated outcome.

CT Scan Finding	No. of cases	Recovery		Mortality	
		No.	%	No.	%
Fracture without intracranial pathology	8	8	100	-	-
Extradural Hematoma (EDH)	20	19	95	1	5
Generalized cerebral edema	12	10	83	2	17
Subdural Hematoma (SDH)	12	6	50	6	50
Mixed lesion	10	1	90	9	90

As for recovery w.r.t. CT scan findings, highest rate of recovery (100%) was reported in patients with fracture without intracranial pathology, while highest mortality was reported in those having mixed lesion (90%) (Table 3).

DISCUSSION

The present study included 50 patients of head injury needing operative intervention and finally all the 50 participants were considered for analysis. An attempt was made to profile the cases to find out various modes and types of head injuries, their clinicoradioloigcal correlations, and to predict the outcome on the basis of clinicoradiological correlation.

Maximum (60%) occurrence of head injury was observed in the relatively younger age group of 15-44 years, which is only natural, as it's the age group of maximum vehicular mobility. Gissane W et al also observed youngsters to be mostly affected by head injuries due to vehicular accidents way back in 1963, a finding which was corroborated by Bahloul M in year 2004.[7,8] Male preponderance (3.16:1) can again be explained by significantly more vehicular usage by men. Zimmerman et al reported the occurrence of head injury in males to be 75% versus 25% in females.[9] Similar to our findings of most of the head injuries (76%) occurring due to road traffic accidents; Mathew Q et al found the contribution of road traffic accidents in 73.5% cases.[10] As for type of vehicle, most of the victims in our study were travelling on two-wheeler (78%), which is in agreement with the findings of Shih T et al.[11]

Present study shows good correlation of GCS with the case outcome; what with consistent improvement in the outcome with increasing GCS score. Young and Rapp claimed that GCS at the time of admission and presence/absence of midline shift are highly reliable indicators of outcome in patients of head injury, especially those undergoing emergency surgeries.[12]

Immediate CT scan head of the patient of head injury is considered essential for multiple reasons; right from diagnosis, management to prognosis. The type of abnormality observed on CT scan holds utmost importance, as is observed in our study. The most common finding observed on CT head in the present study was generalized cerebral edema (50%) followed by extradural hematoma (EDH) (40%). Zimmerman also observed generalized cerebral edema (58%) to be the most common CT scan finding in head injury patients.[9] We reported direct correlation of CT scan finding with the final case outcome, with 100% cases getting recovered in depressed cranial fracture without intracranial pathology and 90% recovery amongst patients with isolated extradural hematoma (EDH). And, on the other extreme, mortality was maximum (90%) in patients found having mixed lesions on CT. Lobato et al also reported outcome from severe head injury to be related to type of intracranial lesion detected on CT.[13] They reported isolated extradural hematoma, single contusion, cerebral edema or a normal CT scan to be associated with a favorable outcome; while multiple contusions, cerebral edema persisting after removal of EDH and diffuse shearing injury to be most dangerous and associated with poor outcome (mortality). Gennarelli T et al demonstrated marked heterogeneity within the severe head injury group and pointed out that patients with same GCS scores have markedly different outcomes, depending upon the causative lesions; further underlining the importance of CT head.[14]

Further, in the present study, patients with abnormal plantar and pupillary reflexes showed abnormal CT scan findings in many of the cases and these signs were considered related to poor case outcome. Mathew Q et al observed GCS 3-5, midline shift on CT head, presence of pupillary changes and advancing age to be factors associated with worst outcomes.[10] Lieberman J et al observed that patients presenting with GCS score of 3 and fixed pupils have practically no chance of survival, while patients with GCS score of 3 and pupils not fixed

should be aggressively resuscitated because many of these patients survive to be discharged.[15]

Out of 50 patients operated in our study, 33 (66%) recovered while 17 (34%) patients expired. It seems from the observations that operative mortality primarily depends upon the lesion for which the patient was operated, as discussed earlier.

We also observed age to be an independent predictor of mortality in traumatic brain injury, with mortality rate going up with the age of the patient (74% mortality in the 45-70 years age group). Levati A et al had also observed mortality rates of 70.6% in patients of head injury aged more than 40 years.[16] The gender was observed not to have any prognostic role in the present study.

CONCLUSION

Road traffic accidents in young age group is the commonest mode of head injury and GCS score is a good predictor of recovery in head injury cases.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Maas AI, Stocchetti N, Bullock R. "Moderate and severe traumatic brain injury in adults". Lancet Neurology.2008;7(8):728-41.
2. Gissane W, Bull J, Roberts B. Sequelae of road injuries: A review of one year's admissions to an accident hospital. Injury. 1970;1(3):195-203.
3. Alkhoury F, Courtney J. Outcomes after severe head injury: a national trauma data bank-based comparison of level I and level II trauma centers. Am Surg. 2011;77(3):277-80.
4. Rizoli S, Petersen A. Early prediction of outcome after severe traumatic brain injury: a simple and practical model. BMC Emerg Med. 2016;16(1):32.
5. Ciapetti M, Migliaccio M. Long-term outcome after severe traumatic brain injury. Critical Care. 2014;18(1):P470
6. Balestreri M, Czosnyka M. Predictive value of Glasgow coma scale after brain trauma: change in trend over the past ten years. J Neurol Neurosurg Psychiatry. 2004;75(1):161-2.
7. Gissane W. The nature and causation of road injuries. Lancet. 1963;2(7310):695-8.
8. Bahloul M, Chelly H, Hmida MB, Hamida CB, Ksibi H, Kallel H, et al. Prognosis of traumatic head injury in South Tunisia: a multivariate analysis of 437 cases. J Trauma Acute Care Surg. 2004;57(2):255-61.
9. Zimmerman RA. Cranial CT in diagnosis and management of acute head injury. Am J Roentol. 1978;131:27-34.
10. Quigley MR, Vidovich D, Cantella D, Wilberger JE, Maroon JC, Diamond D. Defining the limits of survivorship after very severe head injury. J Trauma Acute Care Surg. 1997;42(1):7-10.
11. Tseng Shih L, Tai-Ngar L. Features of head injury in a Developing Country–Taiwan (1977-1987). Jour of Trauma, Injury, Infection, and Critical Care: 1990;30:90-5.
12. Young B, Rapp RP, Norton JA, Haack RND, Tibbs PA, Bean JR. Early prediction of outcome of head injury patients. J Neurosurg. 1981;54:300-3.
13. Lobato RD, Cordobes F, Rivas JJ, de la Fuente M, Montero A, Barcena A, et al. Outcome from severe head inury related to type of intracranial lesion: a computerized tomography study. J Neurosurg. 1983;59(5):762-74.
14. Gennarelli TA, Spielman GM, Langfitt TW, Gildenberg PL, Harrington T, Jane JA, et al. Influence of the type of intracranial lesion on outcome from severe head injury. J Neurosurg. 1982;56:26-32.
15. Lieberman JD, Pasquale MD, Garcia R, Cipolle MD, Li PM, Wasser TE. Use of admission GCS, pupil size and pupil reactivity to determine outcome for trauma patients. J Trauma. 2003;55:437-43.
16. Levati A, Farina ML, Vecchi G, Rossanda M, Marrubini MB. Prognosis of severe head injuries. J Neurosurg. 1982;57:779-83.

Cite this article as: Pusdekar V, Ambedkar S, Bodade R. Study of cases of head injury in a government hospital in rural Indian setting. Int Surg J 2018;5:3252-5.