

www.jmscr.igmpublication.org

Impact Factor 3.79  
ISSN (e)-2347-176x



## A Clinico Radiological Study with Management and Outcome of Head Injury Patients in Bikaner

Authors

**Dr. Dinesh Sodhi<sup>1</sup>, Dr. Anand Nagar<sup>2</sup>, Dr. Neelima Arora<sup>3</sup>  
Dr. Krishna Veer Singh Choudhary<sup>4</sup>**

<sup>1</sup>Assistant Professor and Head of the Department Deptto Neuro Surgery, Sardar Patel Medical College, Bikaner

<sup>2</sup>Sr. Resident, Department of General Surgery, Sardar Patel Medical College, Bikaner

<sup>3</sup>Assistant Professor, Department of Pathology, Sardar Patel Medical College, Bikaner

<sup>4</sup>Senior Resident Deptt of Neuro Surgery, Sardar Patel Medical College, Bikaner

Corresponding Author

**Dr. Dinesh Sodhi**

E-27-A, Kanta Khaturia Colony, Bikaner -334001, Rajasthan, India

Email: [drdineshsodhi1964@yahoo.in](mailto:drdineshsodhi1964@yahoo.in)

### ABSTRACT

*Head injury is the leading cause of morbidity, mortality, disability and socioeconomic losses in India and other developing countries. This article indicates magnitude of the problem, causes, mode of injury, occurrence, risk factors, severity, outcome and impact of head injury on rapidly transforming societies. In India 1.5 to 2.0 million people sustain head injury and 1 million succumb to death every year. RTA are the leading cause (60%), followed by falls (20-25%) and violence (10%). Alcohol involvement and non use of helmet are known to be present in 15-20% of head injuries at the time of injury. The rehabilitation needs of the brain injured people are significantly high and increasing year to year.*

**Keyword:** 1.RTA (Road Traffic Accidents), 2.EDH (Extra Dural Hematoma), 3. SDH (Sub Dural Hematoma), 4. ICH (Intra Cerebral Hematoma), 5. GCS (Glasgow Coma Scale), 6. GOS (Glasgow Outcome Score)

## MATERIAL AND METHODS

This prospective study was conducted on all head injuries patients admitted in department of Neurosurgery, S. P. Medical College and A.G. Hospitals, Bikaner, Rajasthan for the time period of Jan 2012 to Nov 2012 and the total number of patients was 808.

The patients in the study groups were subjected to detailed history, physical examination,

biochemical examination, radiological examination as plain CT head and later on MRI brain.

## OBSERVATIONS

In the present study out of the 808 patients, 62 were excluded from outcome of head injury because they were referred to higher centre on request

**Table 1:** Distribution of cases according to age and sex incidence

Age group (Years)	Sex				Total	
	Female		Male		No.	%
	No.	%	No.	%		
<10	45	5.6	92	11.4	137	17.0
11-20	35	4.3	103	12.7	138	17.1
21-30	17	2.1	224	27.7	241	29.8
31-40	13	1.6	131	16.2	144	17.8
41-50	15	1.9	62	7.7	77	9.5
51-60	8	1.0	27	3.3	35	4.3
61-70	7	0.9	18	2.2	25	3.1
>70	2	0.2	9	1.1	11	1.4
Total	142	17.6	666	82.4	808	100

Table No. 1 shows that maximum numbers of patients were in the most active period of life i.e. 3<sup>rd</sup> decade of life and constituted around

29.87%, Youngest patient was 2.5 months old and oldest was 82 years. The overall male: female ratio was 4.69:1.

**Table 2:** Distribution of cases according to mode of injury

Age Group (Years)	Mode of Injury								Total	
	RTA		Fall		Assault		Misc			
	No.	%	No.	%	No.	%	No.	%	No.	%
<10	40	5.0	93	11.5	3	0.4	1	0.1	137	16.9
11-20	104	12.9	28	3.5	5	0.6	1	0.1	138	17.1
21-30	187	23.1	31	3.8	20	2.5	3	0.4	241	29.8
31-40	110	13.6	17	2.1	15	1.9	2	0.2	144	17.8
41-50	58	7.2	7	0.9	11	1.4	1	0.1	77	9.5
51-60	23	2.8	9	1.1	3	0.4	0	-	35	4.3
61-70	12	1.5	8	1.0	4	0.5	1	0.1	25	3.1
>70	4	0.5	6	0.7	0	-	1	0.1	11	1.4
Total	538	66.6	199	24.6	61	7.5	10	1.2	808	100

Above table shows mode of the head injury- RTA(66.61%), fall from height (24.61%) and 7.5% patients sustained injury due to assaults.

RTA was the commonest mode of head injury in adults. Pediatric age group sustained head injury mainly due to fall

**Table 3:** Distribution of cases according to GCS Score

GCS Score	Sex				Total	
	Female		Male			
	No.	%	No.	%	No.	%
<8	17	12.0	90	13.5	107	13.2
9-12	37	26.1	152	22.8	189	23.4
13-15	88	62.0	424	63.7	512	63.4
Total	142	100	666	100	808	100

Above table shows the GCS score<8 in 13.2% of patients while GCS score 9-12 in 23.4% patients and GCS 13-15 score in 63.4% of patients.

**Table 4:** Distribution of cases according to Mortality in relation to Glasgow coma scale

Glasgow Coma Scale	Total no. of Patients	No. of Mortality	% of Mortality
0-8	96	62	64.6
9-12	154	19	12.3
13-15	496	1	0.2

The table relates the GCS score at the time of admission to mortality of patients with GCS score<8 showed the highest mortality.

**Table 5:** Distribution of cases according to Glasgow Outcome Score ( GOS)

S No	Outcome Score	No	%
1	Death	82	11.0
2	Persistent Vegetative	9	1.2
3	Severe Disability	19	2.5
4	Moderate Disability	87	11.7
5	Good recovery	549	73.6
	Total	746	100

This table shows that mortality rate was 11%.73.6% patients had good recovery. Patients having favorable outcome (GOS4-5) were 85.3% and unfavorable outcome (GOS1-3) were 14.7%.

**Table 6:** Distribution of cases according to Mortality in relation to Mode of Injury

Mode of Injury	Total no. of patents	No. of mortality	% of Mortality	Percentile Mortality
RTA	496	57	11.5	69.5
Fall	184	21	11.4	25.6
Assault	56	1	1.8	1.2
Miscellaneous	10	3	30.0	3.6
Total	746	82	11.0	100

RTA was forerunner in head injury and related mortality,69.5 percentile of total head injury in our study.

**Table 7:** Distribution of cases according to area of presentation

Area of Presentation	No. of patients	% Percentage	No. of mortality	% of Mortality
Rural	467	62.6	56	12
Urban	279	37.4	26	9.3
Total	746	100	82	11

This table describes the distribution of cases according to area of presentation i.e. rural area 62.6% and urban area 37.4%. Rural area had higher rate of mortality.

**Table 8:** Distribution of cases according to pathology of operated patients and mortality pattern

Pathology	No. of patients	% Percentage	No. of mortality	% of Mortality
EDH	52	42.3	9	17.3
SDH	18	14.6	7	38.9
Contusion	12	9.7	4	33.4
Depressed #	14	11.4	2	14.3
ICH ( Massive)	4	3.2	2	50
Mixed	23	18.7	2	8.7
Total	123	100	26	21.1

The operative pathology of maximum patients was EDH (42.3%). The mortality was maximum in massive ICH (50%).

**Table 9:** Distribution of cases according to repeat CT scan done within 24 hours

Repeat CT Scan	No of patients	Change in Treatment Modality	% of Changed Treatment i.e. operative
Done	472	36	7.6
Not Done	336	-	-

This table shows 808 patients of which 472 done within 24 hours and in 36 patients treatment modality was changed i.e. operative (7.6%).

## DISCUSSION

The increased skill of neurosurgeons as well as improved diagnostic ability has salvaged a number of patients who would otherwise have died. Improved methods of investigation, CT and MRI, safer anesthesia, broad spectrum antibiotics and better management of patients have made the outcome better.

In our study age of head injury patients ranged from 2.5 months to 82 years with median age 26 years.

Agarwal et al<sup>(1)</sup> in the year 2012 conducted a study. Age ranged from <1 years to 98 years with median age 31 years.

In our study the highest incidence of head injury was in 3<sup>rd</sup> decade of life, approximately 29.8%. Sambisivan and Ram chandran<sup>(2)</sup>, Yattoo and Tabish<sup>(3)</sup> in 2008 found 24% and 21.25% cases in 3<sup>rd</sup> decade of life.

In our study maximum number of patients approximately 66.6% sustained head injury due to RTA followed by 24.69% by fall and 7.5% cases due to assault. RTA was the commonest mode of head injury in 3<sup>rd</sup> to 4<sup>th</sup> decade of life approximate 76.7%. Agarwal et al<sup>(1)</sup> in 2012 found that RTA causes head injury in 56.3%. Bernat(1998)<sup>(4)</sup> in USA found that RTA cause 80% of cases, followed by fall. Lee et al<sup>(5)</sup> (1992) found that motor cycle accidents cause injury in 54.8% patients followed by fall from height in 30.3%, physical assault in 12.71% and other cause 2.2%.

Glasgow coma scale not only indicates seriousness of head injury but also assesses the patient as a whole and is a good parameter for predicting the outcome of disease. In our study patients with GCS score of 13-15 were 63.4%, 9-12 were 23.4%, <8 were 13.2%. Agarwal et al<sup>(1)</sup> in year 2012 found that patients of head injury with GCS score of 13-15 were 58%, 9-12 were 21.5%, <8 were 15%.

The mortality of GCS score <8 was 64.6%, 9-12 was 12.3%, 13-15 was 0.2 % in our study. Shreshtha A et al<sup>(6)</sup> in year 2011 found the mortality in patients of GCS score <8 was 53.3%, 9-12 was 9.5%, 13-15 was 0.84%.

73.6% patients had good recovery, 11.7% patients had moderate disabilities, severely disabled patients were 2.5% while 1.2% patients were discharged in vegetative state. Shreshtha A et al<sup>(6)</sup> in 2011 found that patients having good recovery were 70.1%, moderate disability were 16.1%, severe disability were 2.6% while 1.2 % were in persistent vegetative state.

In our study 14.7% patients had unfavorable outcome (GOS 1-3) and 85.3% had favorable outcome (GOS 4-5). Shreshtha A et al<sup>(6)</sup> in 2011 found that 13.9 % patients had unfavorable outcome and 86.1% patients had favorable outcome.

In our study we found higher rate of head injury in rural areas (62.6%) than urban areas (37.4%). This is because of less awareness, ignorance, poor infrastructure including mode of transportation,

lack of proper health care facilities in the vicinity and poverty.

Yattoo and Tabish<sup>(3)</sup> in 2008 found higher rate of head injury in rural areas (71.1%) as compared to 28.3% in urban areas.

In our study the operative pathology of maximum patients was EDH (42.3%), mixed pathology (18.7%), SDH (14.6%) and depressed fracture (11.4%). Percentage of mortality was maximum 50% in massive ICH followed by 38.9% in SDH.

In our study of 808 patients 472 patients were subjected to repeat CT scan head and in 36 patients change in treatment modality was done (operated 7.6%). In our study two patients were re-operated on contralateral sides because of development of new hematoma.

Brown et al<sup>(7)</sup> in 2007 found that patients with head injury should undergo repeat CT scan head after neurological deterioration as it needs operative intervention in over one-third of the cases.

## BIBLIOGRAPHY

1. Agarwal A, Galwankar S, Kapil V, Coronado V, Basavaraju SV et al. Epidemiology and clinical characteristics of traumatic brain injuries in a rural setting in Maharashtra, India. *International J Crit Illness and Injury Sci.* 2012 ; 2 (30) :167-171.
2. Sambasivan M, Ramachandran SK. Head Injuries. *J Indian Med Assoc.* 1973; 60 (4) :120-4.
3. Yattoo GH, Tabish A. The profile of head injuries and traumatic brain injury deaths in Kashmir . *Journal of Trauma Management & Outcomes* 2008 ; 2(1) :5
4. Bernat JL, Schwartz GR. Brain death and organ retrieval. *Resuscitation Part I* 1998; 88-89.
5. Lee ST, Lui TN, Chang CH, Wang DJ, Hemburger RF et al . Features of head injury in a developing country. *The journal of Trauma* 1990; 30(1) :194-98.
6. Shrestha A, Joshi RM, Thapa, Devkota UP, Gongal DN, Outcome of Head injury patients undergoing surgical management : a tertiary level experience . *Kathmandu Univ Med J (KUMJ).* 2011; 9(36) :283-5.
7. Brown CV, Zada G, Salim A, Inaba K, Kasotakis G, Hadjizacharia P, Demetriades D, Rhee P. Indications for routine repeat head computed tomography (CT) stratified by severity of traumatic brain injury. *J. Trauma.* 2007 ; 62(6) :1339-45