



A RECORD BASED STUDY OF CRANIAL COMPUTED TOMOGRAPHY SCANS (CT SCANS) BEING CONDUCTED ON CASES OF HEAD INJURY COMING IN RADIOLOGY DEPARTMENT OF RAJENDRA INSTITUTE OF MEDICAL SCIENCES IN RANCHI .

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ABSTRACT

Introduction Traumatic brain injuries are on the rise in India and other developing countries. With more affordability, comes more mobility and more risks as the data suggests Road Traffic Accidents to be the number one cause of all Head Injuries. Head injuries can be a big dampener in one's productivity, can take a big toll on the near and dear ones owing to its long demands for the patient to be cured completely. CT scans since their invention have been proved to be of immense help in timely surgical or medicinal interventions owing to the clarity and pin point picture they provide of the extent of the damage or the picture after trauma . Evidence from the state of Jharkhand is hard to find about the types of head of Injury coming for CT scans and the findings obtained in the CT scans. With an aim to understand the present study was undertaken.

Methodology The present study was a record based study undertaken in the radiology department in Rajendra Institute of Medical Sciences in the state capital of Jharkhand (Ranchi). A total of **208** records available in the department with care taken to include only those records were reviewed , which were found to be having complete entries of Age ,sex ,Glasgow Coma scores , APL status ,BPL status etc. **Results** Total of 208 Cranial CT scans were performed in the study period for head trauma . Male to female ratio was 3.5:1 (Table 1) . About 40% of the scans were performed on patients in the age group of 21-40. About 62% of cases were from Urban population and 70% of cases were Above Poverty Line . Head injury occurred due to Road traffic Accidents in most cases (65%) followed by Alleged falls (21%) ,and assaults (14%) .A GCS score of 9-12 was recorded in majority of the cases .

KEYWORDS :

Across the Globe, Traumatic Brain Injury is one of the leading causes of disability and mortality. In fact evidence suggest head injury to be the single largest cause. (1,2) Majority of head injuries are due to road side traffic accidents. Conservatives estimates put the numbers in India close to 1.6 million people seeking care in hospitals across the country for traumatic brain injury . (3) India comes under the lower and middle income group of Countries where more than 80% of world population lives in which India contributes a majority. India also has the highest rate of accident rates per vehicles 35 per 1000.(4).The management of head injury with proper investigation takes a huge toll on the patients ,relatives and hospital staff considering its long nature in full recovery and the poor prognosis in many cases .Early Diagnosis and Treatment in cases of severe head injury may significantly alter the grim mortality and morbidity often associated in these cases (5). Advent of CT scans revolutionized the management with accurate diagnosis and enhanced imaging for all Brain Injury cases. CT scans make the detection of extra axial hematomas early, which if needed, can be managed better by surgical interventions. There is ample evidence to suggest decrease in mortality and morbidity after CT scan coupled with quick surgical interventions.(6)

CT scans are often cited as one of the costlier investigations among patients and medical fraternity. Because of its necessity it is though being done in its indicated conditions.

Ranchi being the state capital of Jharkhand is home to increasing cases of Road Traffic Accident in which majority are head injuries mandating the CT scans .(7,8)

Rajendra Institute of Medical Sciences (RIMS) being the state premier institute offers the facility of T scan in a relatively less cost and free for Below Poverty Line patients , thus making it the place

where most cases come for investigations and also immediate

surgical interventions if needed is done in the neurosurgery department.

To understand the nature of cases coming in our institute and its various parameters it was imperative to analyze the records. Data regarding the various findings seen in Jharkhand or its adjoining areas is hard to find . This study was carried out with an aim to establish the evidence about the CT scan findings being seen in head injury cases coming in RIMS for treatment. The evidence thus generated will also help fellow researchers in understanding the situation better and the policy makers to design policy in accordance to the findings thus concluded.

Objectives of the Study

1. To understand the socioeconomic and demographic profile of the patients coming for CT scan with head injury .
2. To evaluate the cause of head injury cases coming for CT scan .
3. To describe the findings seen on CT scans done in head injury cases .

Methodology of the Study

The present study was done in the Radiology Department of RIMS, Ranchi. Records of CT scan done from period of September 2017 to February 2018 was assessed. CT scan records of only those patients were reviewed who presented with head injury. In RIMS all CT scans by expert radiologists along with following the standard protocols .CT scans are generally performed for head injury cases who are admitted with priority, while the OPD cases might have to wait depending on the availability. As the entries are still done in manual register in some entries we did found some details missing. We looked for Age ,Gender , Address ,Above Poverty Line/Below

Poverty Line , Cause of injury , Clinical Classification of injury into mild , moderate and severe , GCS and CT findings . Incomplete entries (if any) and follow up cases, were excluded from our record review. In a period of approx. six months we reviewed 208 cases/CT records.

Results

Total of 208 Cranial CT scans were performed in the study period for head trauma (Table 3). Male to female ratio was 3.5:1 (Table 1) . About 40% of the scans were performed on patients in the age group of 21-40(Table 1) . About 62% of cases were from Urban population and 70% of cases were Above Poverty Line (Table 2). Head injury occurred due to Road traffic Accidents in most cases (65%) followed by Alleged falls (21%),and assaults (14%)(Table 3). A GCS score of 9-12 was recorded in majority of the cases.(Table 3)

Age Group of Patients	Numbers	Males	Females	Total	Percentage
0-10	20	14	6	20	9.62
0-11-20	28	23	5	28	13.46
0-21-30	48	39	9	48	23.08
0-31-40	36	25	11	36	17.31
0-41-50	19	7	12	19	9.13
0-51-60	29	29	0	29	13.94
0-61-70	20	20	0	20	9.62
0-71-80	6	4	2	6	2.88
>80	2	1	1	2	0.96
Total	208	162	46	208	

Table 1 Showing the demographic Details

	Numbers	Percentage
Male	162	77.88
Female	46	22.12
Rural	78	37.50
Urban	130	62.50
APL	152	73.08
BPL	56	26.92

Table 2 Showing the socioeconomic details along with Gender Distribution (n=208)

	Various Causes for Head Trauma					CT Findings	Glasgow Coma Scale (GCS Scores)				CT with Positive Findings N=135	
	Causes						GCS 3-8 (N=40)	GCS 9-12 (n=113)	GCS 13-15 (n=55)	Total		Overall Percentage from N = 208
	Road Traffic Accident	Alleged Falls	Assault	Others								
	40	20	13	0		Normal Scan	0	41	32	73	35.10	0
	32	10	11	0		Oedema/Contusion in Brain	20	18	15	53	25.48	39.26
	38	5	0	1		Sub Acute and Chronic Subdural Hematoma	3	37	4	44	21.15	32.59
	3	4	2	0		Acute Subdural Hematoma	7	2	0	9	4.33	6.67
	11	4	2	0		Depressed and Linear Skull Fracture	3	11	3	17	8.17	12.59
	4	0	0	0		Epidural hematoma	2	1	1	4	1.92	2.96
	4	0	0	0		Skull Base Fracture	2	2		4	1.92	2.96
	4	0	0	0		Intra Cranial Hemorrhage	3	1		4	1.92	2.96
	0	0	0	0		Intraventricular Hemorrhage	0	0	0	0	0.00	0.00
Total	136	43	28	1	208	Total	40	113	55	208		
Percentage (N=208)	65.38	20.67	13.46	0.48								

Table 3 showing the detailed findings of the CT scans and Various Causes of Head trauma Cases along with Glasgow Coma Scale Scores.

In this review we found 35% of cases to be having a normal CT scan , while 39% of CT Scans with positive findings had Oedema or some contusion of Brain . 32% % of the CT scans with a positive finding revealed Sub Acute /Chronic Subdural Hematomas.(Table 3)

Discussion

India continues to be plagued by increasing rise of Road traffic accidents leading to head injuries particularly among young males (.9) . In our study we had similar findings which are also in line with other studies done across the country (10). Sekhar et al concluded in their study about the increase in RTAs and Head injury in major metros and in our study we too find similarities as Ranchi being the capital of the state and one of the biggest and busiest cities of the

State .(10) Studies done elsewhere including the above citation too had found male predominance of the cases coming for the CT scans .(11) In our study we found more persons coming for CT scans from Above Poverty Line (APL) which is in line to other studies cited above . Better income gives them means for mobility and better access to health care that's why the greater numbers . Urban Population has high mobility hence higher chances of being injured owing to fast moving vehicles and better road facilities .Our study did found more cases from Urban population as have been found in other studies done .(12) The age group found most in our study was between second and third stage of life which also is the most productive age group . Other studies across the globe also have similar findings . These findings emphasize the importance of the RTAs or head injuries in relation to overall productivity and the impact these can have over all in affected families and the society .

Though some studies early in the 2000 were skeptical about the use and practicality of CT scan use in cases of head injury (14) with building evidence there is an unanimous opinion about the benefits of CT scan in all head injury cases (15). In our study we had 35% of CT scans out of 208 CT scans reviewed with out any positive finding. This data is in coherence with other studies done in India (10) .

We were also able to evaluate the Glasgow Coma Scores (GCS) and in records reviewed we found 113 patients with head injury to be having a GCS of 9-12 .

In our study majority of CT scans revealed contusion in brain or oedema which is an indicator of quick access to CT centres and mere 35% need more coverage so that early intervention can be promptly done .

In our study we found a sizeable percentage of Subacute and Chronic Subdural Hematoma 32% (Table 3) which is an important pointer for late presentation for CT Scanning. Evidence suggest such type of cases will be best suited for early surgical intervention in form of evacuation. Early intervention will prevent any neurologic and metabolic consequences to set in. These findings tell similar story in other developing countries like Nigeria , Brazile etc. (16)

Conclusion

The CT scans give very clear and early picture for management of Head injury cases which is one the rise in our country and its most populated upper tier cities like metros ,state capitals . Cost of CT scan is still deterrent to many patients which either compel them to come late for CT scans or ignore it . Early CT scans coupled with surgical evacuation and other necessary procedures significantly reduces the gravity Head injury brings along . Universal Health Coverage with major stake from Government might help in reducing one of the barriers for accessing the CT scan services in our setting . More research is needed to understand various correlates of CT scan and the results thus obtained .

Limitations of the Study

The present study was a record based study .

Conflicts of Interest

None

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