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EVALUATION OF TRAUMATIC BRAIN INJURY PATTERN BY CT SCAN

Radio-Diagnosis

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KEYWORDS

INTRODUCTION

- In emergency rooms, head injuries are frequent problem.
- Over 2 million visits to accident and emergency departments are caused by traumatic head injury every year.
- On an average approximately 90 cases of trauma per month are reported in Rajshree medical research institute , Bareilly.
- Head injury is considered as a major health problem that is a frequent cause of death, disability and makes considerable demands on health services.
- CT remains essential for detecting lesions that require immediate neurosurgical intervention and that require in-hospital observation and medical management.

Aims And Objective

Aim

- To demonstrate the pattern of traumatic brain injury in Rajshree medical research institute by CT scanning .

Objectives

- To evaluate the computed tomography findings in patients sustaining head injury.
- Correlation of mortality as per GCS & pattern of injury.

MATERIAL AND METHODS

- The present cross-sectional study was conducted after clearance from Board of Studies, Department of Radiodiagnosis, Rajshree Medical Research Institute, Bareilly .
- The sample size was determined to be 100 patients.
- The study subjects were chosen as per the inclusion and exclusion criteria.

Inclusion Criteria

- Patient referred to the department of Radio-diagnosis for CT scan head with clinical history of head injury, irrespective of cause of head injury.

Exclusion Criteria

- Follow up Patients of head injury who presented earlier for CT scan head.
- Patient with any history of surgical intervention.
- Patient refusal for CT scan.

Method Of Collection Of Data

- After taking informed consent, the detailed clinical history was taken (including age, sex, date of injury, manner of injury and duration of LOC if any).
- General and systemic including detailed CNS examination by neuro/ emergency team noted.
- After initial resuscitation , severity of the cranio-cerebral injury was graded with the help of "Glasgow Coma Scale" (GCS) in emergency room by neuro team.
- The patients referred for computed tomography of the head & CT findings noted.
- The data was entered into the Microsoft excel and the statistical analysis was performed by statistical software SPSS version 25.0.

RESULTS

Table 1:

		Frequency	Percent
Agre Group	1-10 years	24	24%
	11-20 years	16	16%
	21-30 years	20	20%
	31-40 years	14	14%
	41-50 years	9	9%
	above 50 years	17	17%
Gender	Male	67	67%
	Female	33	33%
Etiology	RTA	74	74%
	Fall from height	26	26%
Symptoms	Loss of Consiousness	30	30%
	Vomitiing	23	23%
	Headache	45	45%
	ENT bleed	29	29%
	Alcohol consumption	13	13%

Table 1 showed that the most commonly affected age group was 1-10 years (24.0%) There were 67.0% males and 33.0% females affected. Majority of the subjects had injury due to road traffic accidents (74.0%) followed by fall (26.0%).

Table 2:

GSC Score	Frequency	Percent
Mild	80	80%
Moderate	12	12%
Severe	8	8%

Table 2 showed that GCS score was Mild score among 80.0%, Moderate among 12.0% and Severe among 8.0%.

Table 3:

CT Findings	Frequency	Percent
Contusions	31	31%
EDH	8	8%
SDH	31	31%
SAH	23	23%
Cerebal Edema	8	8%
IVH	2	2%
Pneumocephalus	8	8%
Fractures	97	97%

Table 3 showed CT findings showed that there were Contusions among 31.0%, SDH among 31.0%, SAH among 23.0%, and Fractures among 97.0% subjects

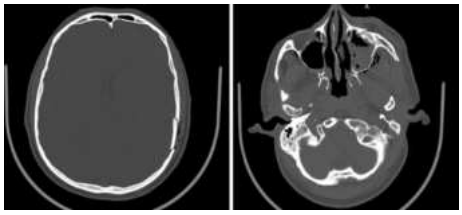
TABLE 4:

	Mortality		P-value
	No	Yes	
Mild GCS	80	0	0.001*
	84.2%	0%	
Moderate GCS	12	0	
	12.6%	0	
Severe GCS	3	5	
	3.2%	100%	
Contusions	27	4	0.015*

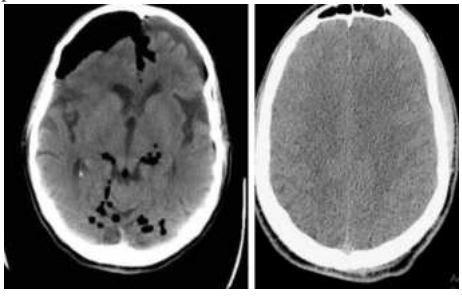
	28.4%	80%	
EDH	6	2	0.007*
	6.3%	40%	
SDH	28	3	0.047*
	29.5%	60%	
SAH	20	3	0.044*
	21.1%	60%	
Cerebral Edema	6	2	0.007*
	6.3%	40%	
IVH	1	1	0.003*
	1.1%	20%	
Pneumocephalus	6	2	0.007*
	6.3%	40%	

Severe GCS score, Contusions, EDH, SDH, SAH, Cerebral edema, IVH and Pneumocephalus were significantly associated with higher mortality

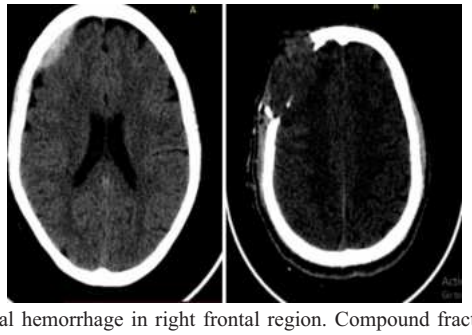
IMAGES



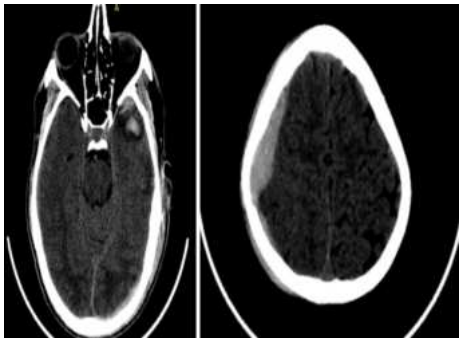
Fracture of left parietal bone and fracture of anterior, lateral & medial wall of left maxillary sinus with hemosinus. Air pockets seen in the left temporal fossa



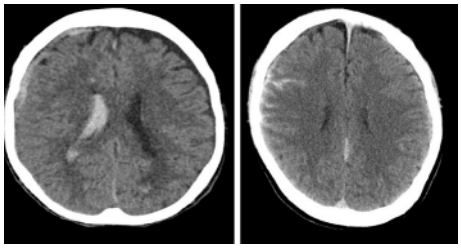
Large right pneumocephalus compressing right frontal lobe few air foci in basal cistern and occipital region with diffuse cerebral edema



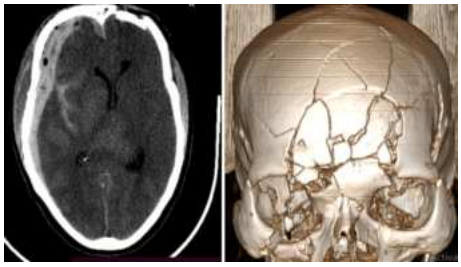
Epidural hemorrhage in right frontal region. Compound fracture of right frontal bone with herniation of brain parenchyma (patient was under influence of alcohol)



Hemorrhagic contusion left temporo-frontal cortical region. Subdural hemorrhage cerebral convexity in right high fronto-parietal region.



Intraventricular hemorrhage in right lateral ventricle with right sided cerebral edema. Sub arachnoid bleed in right frontal region



Sub dural hemorrhage in right frontoparietal region with SAH in right sylvian fissure causing mass effect and significant midline shift with cerebral edema. Multiple skull fractures were seen. Patient was case of RTA

DISCUSSION

- This study was aimed at reporting CT findings of Traumatic brain injury in patients undergoing head CT examinations due to histories of head traumas.
- Head trauma mostly affected active-age guys and men.
- Unspecified trauma was mostly Road Traffic Accidents being accountable for head injuries and traumatic brain injuries.
- Males and young/productive age people participate in dangerous activities like driving, predisposing them to injury.
- Children head injuries encountered as RTA sitting on mothers lap on bikes or fall from height.
- In our study, males (67.0%) were found to be more affected than females (33.0%).
- Similar representation of men and women has been recorded in other research by Masih Saboori et al(78.2%).
- In the present study, the peak incidence of head injury occurred in the age group of 1-10 years (24.0%) followed by 21-30 years (20.0%) and above 50 years (17.0%)

Eiology of Injury:

- In current study, Road traffic accidents were found to be the commonest reason for injury among the subjects with 74.0% followed by fall (26.0%).
- Similar findings were reported by Bindu et al (RTA responsible for 68.0% of injuries) .
- In the present study, patients classified as per GCS score was Mild among 80.0%, Moderate among 12.0% and Severe among 8.0%.
- This was in congruence from the findings of Bindu et al, majority had GCS score of ≥ 14 (mild head injury) followed by 23 having moderate head injuries and 13 having severe head injuries

CT Findings

- In this study, the most common intracranial lesion found by CT was contusion(31%), similar findings were found by Prasad et al. that contusions (39%) was the most common injury in cases brain trauma.
- In this study, subdural hematoma was found to be the most common type of bleeding at 31.0%. Saboori et al. reported a 34.7% incidence of subdural haemorrhage.
- Intraventricular haemorrhage was the type of bleeding that was seen the least often in this study (2.0%). Le Roux PD et al said that IVH is seen in 1% to 5% of people who have a head injury, not so common.
- In the current study, there was a strong link between Contusions, EDH, SDH, SAH, Cerebral edema, IVH, and Pneumocephalus and a higher risk of death.

Association of GCS Score with Mortality-

- In the present study, poor outcome was noted with severe GCS score (8%)with a mortality of 100.0% followed by and none among those with mild and moderate GCS score.
- This was quite similar to the study by Khadka et al, 8 patients (10%) expired who had severe head injury (GCS 3-8).

CONCLUSION

- The most common etiology for head injury was RTA .
- Contusions and SDH were most common CT pattern of injuries.
- Most common GCS was Mild followed by moderate & severe.
- Mild & Moderate GCS has zero mortality and severe GCS has 100% mortality in our study.
- CT is the imaging technique of choice in acute head trauma, providing reliable identification of contusions , extra-axial haemorrhage, fractures, hydrocephalus, mass effect, and vascular damage, surgery planning, prognosis, and recovery time.

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