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A study on the various clinico-radiological patterns of head injuries in a tertiary general hospital

E. Babu Sridhar

Associate Professor, Dept. of Radiology, Kamineni Institute of Medical Sciences, Narketpally, Nalgonda, Telangana, India

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ABSTRACT

Aim of the study: To study the various clinico-radiological patterns of head injuries. MATERIAL AND METHODS PLACEOF STUDY: Mamata General Hospital, Khammam. The machine used was GE Sytec 1800, III Generation Scanner. STUDY POPULATION: Study comprises of 100 patients of both sexes belonging to all age groups. STUDY PERIOD: November 2005 to October 2007. CRITERIA FOR SELECTION OF CASES: Only those head injury cases, who underwent CT scanning were included in this study METHODS FOLLOWED: Detailed history was taken from the patient and methodical clinical examination was done for every case. Old reports and radiographs if available have been evaluated.

Key words: Head injury, CT, MRI, Khammam

Address for Correspondence: Dr**.** E. Babu Sridhar, Associate Professor, Dept. of Radiology, Kamineni Institute of Medical Sciences, Narketpally, Nalgonda, Telangana, India

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INTRODUCTION

There were 44 cases with the skull fractures in our study. The commonest site of skull fracture was Frontal (22/44) followed by Parietal (8.44). The high mortality is associated with Occipital (66.6%) and Parietal (62.5%), followed by Temporoparietal (50%). The second most frequent mode of accident was fall, in Gutman's series most of these falls occurred from low heights in and around the home, this is in contrast to our series where most of the falls were from heights because most of our fall patients belong to daily masonry works.

MATERIAL AND METHOD

Place of study: Mamata General Hospital, Khammam. The machine used was GE Sytec 1800, III Generation Scanner.

Study Population: Study comprises of 100 patients of both sexes belonging to all age groups.

Study Period: November 2005 to October 2007.

Criteria For Selection Of Cases: Only those head injury cases, who underwent CT scanning were included in this study.

Methods Followed: Detailed history was taken from the patient and methodical clinical examination was done for every case. Old reports and radiographs if available have been evaluated.

Plain radiographs – skull AP, lateral views are taken if necessary • Plain CT scans for head and brain performed. CT scan comprised 5 mm serial axial sections in posterior fossa, 10 mm sections in supratentorial compartment done without contrast administration and 2 mm slices in the region of importance, if necessary in some cases. Based on the CT findings and preoperative findings these 100 cases were classified into five major categories: 1. Extra Dural Hematomas (EDH) 2. Subdural Hematomas (SDH) 3. Focal Brain Contusion 4. Intracerebral Hematomas (ICH) 5. Normal Scan. On the CT scans, the location of each lesion was identified. A search was made for the presence of blood within the ventricular system or in subarachnoid space / Extradural space / Subdural space. Further, bone windowing was done to locate the fractures in the base of the skull or calvarium.

RESULTS

This study consists of 517 head injury patients among whom, only in 100 cases CT scan was performed. Of the above 100, only 75 were found to have intracranial hematomas. All these patients were classified based on location, size, extent of hematomas and associated findings such as fractures of cranium. Age incidence of different hematomas were collectively and individually analysed.

It is evident from the Table - I that the most vulnerable age group of head injuries with intracranial hematomas is 21-40 years. People above 60 years of age and in those below 20 years of age are less prone for head injuries. The mortality rate was at its peak in patients of the age group of more than 60 years (75%). The cause of ICH in older age group is usually due to non-traumatic causes like hypertension.

Mortality rate was about eight times higher in those patients with shift of midline structures when compared to those with no midline shift. In-patients with EDH, showing no midline shift the mortality was nil. In those EDH, showing shift of midline structures of less than 5 mm the mortality was 50% whereas it increased to 83% in those with more than 5mm midline shift. In the case of SDH patients showing no midline shift, the mortality was nil. If the midline shift was less than 5 mm the mortality was 50%.

DISCUSSION

Incidence of traumatic intracranial hematoma is recognized in greater frequency now, after the advent of CT scan. The peak incidence was found in 21-40 year age group. Patients of 41-60 year age group and those less than 20 year age group were the next in frequency (25% and 18% respectively). These are in contrast to the incidence of K.J. Van Dongen etal (1983) where the maximum incidence was noted in the age group below 20 years (40%), followed by 21-40 year and 40-60 year age group (23% each). The increased incidence in our series among the age group of 21-40 years can be explained by the fact that these are the people who ride motorised two wheelers and are hit by heavy vehicles in the road traffic accidents, occurring mostly in the national highways. The other patients in this are group were those who fell from or from a height (masons and daily wage workers).

Clinical Findings and Frequency of Abnormality on CT Scan: Almost all the patients who presented with loss of consciousness and focal neurological defiits have abnormal findings on CT scan. Only about 50 to 60% of patients presented with either loss of consciousness only or with focal signs. Patients who presented with no loss of consciousness or focal deficit formed less than 10% in our study. This closely comparable to the study of French and Dublin (1977).

Table-1: Age Incidence of Intra Cranial Hematomas

Age	Total		S.D.H.				CONTUSION				I.C.H.				E.D.H.				Total	
	No	%	Inc.	%	MR	%	Inc.	%	MR	%	Inc.	%	MR	%	Inc.	%	MR	%	No.	MR
<20 Yrs	15	20	2	7	-	-	8	30	3	37	3	13	-	-	2	13	-	-	3	20
21-40	38	52	16	53	5	62	14	55	4	28	11	48	5	45	9	60	6	66	20	52
41-60	18	23	9	33	2	29	4	15	1	25	6	26	3	50	4	27	3	34	9	50
> 60 Yrs	5	5	2	7	1	13	-	-	-	-	2	13	2	100	-	-	-	-	3	75
Total	75		29		8		26		8		22		10		15		9		35	

Note : Some of the cases are having more than one type of hematoma.

Table - 2

MIDLINE SHIFT									
Pathology	ABSENT			LESS THAN 5 mm			MORE THAN 5 mm		
	Imp.	Died	M.R.	Imp.	Died	M.R.	Imp.	Died	M.R.
EDH	2	-	-	3	3	50%	1	5	83%
SDH	2	-	-	11	2	15%	6	5	45%
ICH	2	2	50%	6	3	33%	4	5	55%
CONTUSIONS	10	2	16%	7	3	30%	-	3	100%
NORMAL	28	2	6%	-	-	-	-	-	-
TOTAL	44	6	12%	27	11	29%	11	18	47.3%

NOTE: Abbreviations - Imp. - Improved; M.R. - Mortality Rate

TABLE – 3: INCIDENCE OF DIFFERENT TYPES OF TRAUMATIC HEMATOMAS A COMPARATIVE TABLE

Source of Data	Total Cases	EDH %	EDH + IDH %	SDH %	SDH + IDH %	ICH %
Jamieson and Yelland Brisbane	763	13	11	34	36	6
Teasdale and Galbrath Glasgow	180	24	9	31	23	13
International Collaborative Study Glasgow, Groningen, Los Angeles	487	16	7	22	34	20
Jennett. B. Teasdale Cincinnati	2907	11-24	7-11	3-42	23-58	6-20
PRESENT STUDY	547	7	8	18	26	15

Midline Shift: In our series the incidence of patients having more than 5 mm of MLS was (29%), but those with MLS of less than 5 mm was 38% which is similar to that in the series of Srinivasan etal study as against (49%) in our series. This may be due to the selection of greater number of patients with more than 5 mm MLS in Srinivasan etal study than those in our series. A sharp prediction using the above 3 CT features could be made in 25% of our patients 85% of these, predictions proved to be correct. These results are similar to those of Van Dongen etal series, who reported 30% sharp predictions, of which 91% proved to be correct regarding the prognosis. The primary aim of making these predictions is not be determine the course of management, but the identification of powerful prognosticators, however allows improved comparison of data and management results from various centers. It is therefore important to continue to compare the performance of different statistical models and to analyze the predictive value of various parameters in the CT data. More attention should be given to the state of the basal cisterns as an important prognosticator while analyzing the CT evaluations.

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