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A STUDY OF THE PATTERN OF HEAD INJURY IN DISTRICT ALIGARH. U.P.. INDIA

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ABSTRACT

Trauma as a general rule carries medicolegal implication. Head injury adds complexity to the problem as it adversely affects the complete evaluation of trauma until some time has elapsed after a particular injury. The often ill-defined clinical manifestation, the impact of claim settlements, and malingering further add to the problem of fair decision.

Key words : Accident, Head Trauma.

INTRODUCTION

The city of Aligarh in Uttar Pradesh is growing up in every conceivable way; in educational establishments, roads, buildings, business, energy infrastructure and, of course population. It has a huge international residential Central University housing 28,000 students within its sprawling campus. 1/4th are female students. The city in-dwellers population stood at 8 Y2 lakhs (census 2000) not counting another 1800,000 liberally spread in adjourning rural areas. The rural and urban areas combine to constitute an electoral constituency. To be a district a town must have administrative offices, local governing bodies, tehsils and municipality. The land mass is not taken into account, population is. On the basis of population electoral constituencies are carved out. Because of these interacting demographic forces accentuated by fast growing economy some unpleasant dynamics have been introduced in the form of violence, accidents and intentional negligence. These were the reasons the authors selected Aligarh for the study of head injury in different perspective. The objectives laid down were:

1. To determine the pattern of head injury.
2. To study the mechanism of head injury.
3. To demonstrate the mode or causation of head injury.
4. To study the incidence of head injury in relation to age, sex and aetiology.
5. To correlate the injury with lesions produced in the head.
6. To know the different types of intracranial lesions, their frequency and relation with the mode of injury.

MATERIAL AND METHODS

A total of 100 cases with documented antecedent head trauma were selected for the study. Gender and age differentiation was not of paramount importance. Patients reporting to the Emergency Section of J.N. Medical College Hospital, A.M. U., Aligarh, within 24 hours of receiving trauma were included in the study; those beyond 24 hours were excluded. It was not taken into consideration whether they had received treatment elsewhere before reporting to this hospital.

The clinical presentation of the traumatized patient & diagnostic CT scan formed the basis of the study.

The CT scan was read and commented upon by qualified radiologist in conjunction with neurosurgeon, both of the rank of Reader. The CT Machine used was SOMATOM-ARC manufactured by SIEMENS. This is a third generation whole body CT scan with a continuously rotating tube detector

system. The matrix size was 256X256. CT scans were performed as early as was feasible; however, delayed/repeat contrast scans were also carried out, if indicated.

To infuse uniformity all CT scans were evaluated according to the following aspects:

1. The presence or absence of visible lesion.
2. The depth of the lesion.
3. The degree of attenuation in the lesion as compared to that of normal brain tissue on the Hounsfield scale (Fig. 1) 1.
4. The presence or absence of mid line shift.
5. Ventricular or subarachnoid abnormality.
6. Any body abnormity i.e. fracture or pre existing body abnormality contributing to the lesion.

OBSERVATION & DISCUSSION

Age & Sex Pattern

n=100, 33% were below 10 years of age (male=27; 81%; female=6; 18.1%) constituted maximum chunk. In 11-20 years age group n=21 (male=19; 90.4%; female=2; 9.5%) and in 21-30 years age group n=21, (males=17; 80.9%; females=4; 19% constituted the subjects.

As is evident from table-I, n=100, the maximum number of casualty occurred in age group of 0-10 years, both in males and females.

Mode of injury of the victims

Fall from variable height (n=40,) road traffic accidents, n=40 (pedestrians=18, 45%; motor vehicle occupants=22, 55%); assaults (hit) (n=14) and gun shot injury (n=2) [Table 2(a)]. However in Table 2(b) the mode of injuries are depicted in relation to age slabs 0-10 years age group was found to be most vulnerable as falls constituted, 84.8% (n=28) out of total n=44.

Various computerized tomographic finding in head injury

Out of total n=100, positive CT scans were obtained in 73; 42 (57.5%) were adults i.e. above 18 years of age; 31 (42.4%) were in subjects less than 18 years of age. Negative CT scans were in n=27; 11 (40.2%), <18 years=16 (59.2%) and >18 years n=16 (59.2%) [Table 3(a)].

Table 3(b) depicts different lesions observable in positive CT scans in n=73. As expected scalp haematoma constituted 86.3% of injury followed by intracranial lesion i.e. cerebral contusion 56.1% haemorrhages 35.5% (subdural 16.4%, extradural 10.9%, & subarachnoid 8.2%) and cranial fracture 46.5%.

For the sake of precision, the head injuries were observed in the perspective of small age groups. This was done with the objective to find out which of the group had suffered which type of injury and what precautionary measures could be recommended [Table 4 (a)].

Another important aspect this study covered were different types of lesions, produced by various mode of injury [Table 4(a)] and location of these lesions in CT picture [Table 4(b)]. As is evident from these tables, subdural hemorrhage was found maximally in victim assault (42.8%) predominantly found in frontal (66.6%) and parietal regions (33.3%). This was followed by cerebral contusions found in cases of unspecified fall (50%), road traffic accidents (37.5) and assault on head (21.4). Cerebral contusions were parletal) and temporal (14.6%) regions.. Please refer to tables 4(a) and (b) for further elucidation of other types of lesions.

Mortality

Six patients (6%) died in the series of 100 patients of head injury forming the present study admitted to J.N. Medical College Hospital, Aligarh. All were males 5 out of 6 (83.3%) were above 18 years of age (mean age :f:22.5); 1 person was less 18 years (17.5 years). Two showed subdural haemorrhage (33.3%); 4 cerebral oedema and the probable came of death was asphyxiation pneumonitis. Four of the total 6 patients had hospital stay of less than 24 hours prior to succumbing while two survived for 5 days dying ultimately.

CONCLUSION

A total of 100 cases with documented history of head trauma were evaluated clinically in the Emergency and Neurosurgey OPD of J.N.M.C. Hospital and scanned by computerized tomography in this series.

Of the 100 patients 47 were below 18 years of age and 53 were adults. Male predominated, constituting 83 of the total of 100 patients (83%). Fall accounted for most of the casualties especially in children below 10 years of age for whose fall from an unspecified height again was a predominant aetiological factor (81.8%).

In this series 76% cases were scanned within 8 hours of injury, while remaining were taken up for computerized tomography thereafter. Positive computerized tomographic picture was seen in 73 patients. A negative scan for head injury was observed in (27%).

Of the 76 patients who underwent emergency computerized tomography 60 patients (78.9%) showed varying abnormalities. However, of the 24 patients who underwent delayed scanning only 13 patients (54%) showed positive lesions.

Scalp swelling or haematoma was observed in (86.3%) of the cases and was the most common CT finding. Of the patients who showed abnormality on scan 02 had intracerebral haematoma, while contusions were seen in 41 patients (56.1%) followed by subdural haematoma in 12 cases (16.4%).

Cerebral edema was a common intra-cranial finding. A majority of the epidural, subdural and intracerebral haematoma were found in adults. Of the 34 (46.5%) skull fracture cases, 23 were in adults. The commonest site for subdural and extradural haematoma was found to be the frontal region followed by the parietal in subdural haematoma, temporal for extradural haematoma, respectively. Most of the contusions and subarachnoid haematoma were seen in the frontal region followed by the parietal region. computerized tomographic examination was done whenever required.

By rapidly and accurately depicting the spectrum of various gross neuropathological lesions resulting from trauma to brain helps in prompt and effective management of head injury patients. The neurosurgeon can quickly decide whether to institute conservative therapy or opt for definitive surgery, thereby decreasing the amount of surgical intervention and its allied complications in patients suffering from head injury.

Assessment of prognostic value cannot be under-rated in head injury patients. As regards accuracy of CT interpretation, timing is important. A CT scan taken in the immediate post injury period is ideal compared to long time after the injury that may lead to erroneous interpretations and hence decreased accuracy.

It was noted that the overall lack of awareness among the pedestrians and the carelessness for traffic rules by the motorists were important reasons for most of the accidents. Almost no use of helmets, though mandated by law, use of seat belts sparingly by the vehicle occupants, poor conditions of roads and increased social violence are recognized factors to which attention should be paid.

Table 1

Age and Sex Pattern of 100 Patients Included in the Study

Age Group (Years)	Male	Female	Total
0-10	27 (81.8%)	06 (18.1%)	33
11.20	19 (90.4%)	02 (9.5%)	21
21.30	17 (80.9%)	04 (19%)	21
31-40	09	02	11
41-50	07 (70%)	03 (30%)	10
51-60	04 (100%)	-	04
Total 83	17	100	

Table 1-A
Mode of Injury

Mode of Injury	Numbers	
1	Road Traffic Accidents	40
	Pedestrians	18 (45%)
	Motor Vehicle Occupation	22 (55%)
II	Fall	44
III	Assaults (Hit)	14
IV)	Gunshot Injury	02
	Total	100

Table 2
Mode of injury in different age groups

				Years		
Mode of Injury	0-10	10-20	20-30	30-40	40-50	50-60
Fall	28	10	03	01	01	01
	(84.8%)	(47.6%)	14.2%)	09%)	10%)	(25%)
RTA	05	08	12	07	07	01
	15.1%	(38%)	(57.1%)	(63.6%)		
(70%)	25%)					
Hit Assault	-	03	06	03	01	01
		14.2%	28.4%	14.2%	10%	25%
Gun Shot	-	-	-	-	01	01
					10%	25%
Total	33%	21%	21%	11%	10%	04%

Table 3
Positive and negative CT scans in relation to age pattern of patients n=73

Positive C.T. Scan (73)			Nagatie C.T. Scan (27)	
>18years	<years		>18years	<18years
42	31	11	16	
(57.5%)	(42.4%)		40.7%)	(59.2%)
10.	Intracerbral		02 (02.7%)	

Table 4
Various lessions in C.T. scan in head injury

S.No.	C.T. Diagnosis n=73	No.of Patients with positive findings
1.	Scalp/subdural swelling/ haematoma	63(86.3%)
2.	Cranial Fratcture	34 (46.5%)
3.	Cerebral Oedema (Isolated)	24 (32.8%)
4.	Cerebral Contusion	41(56.1%)
5.	Subdural Haematoma Hge	12 (16.4%)
6.	Extradural haemorr	08 (08.2%)
7.	Sub-Arachnoid Hae.	06 (08.2%)
8.	Intraventicular haemorrhage	01 (01.3%)
9.	Pneumocephalous	06 (08.2%)

Table 5
Distribution of C.T. Finding in Various Age Groups

S.No.	C.T. Diagnosis	Age in years					
		0-5	06-10	11-15	16-20	>20	Total
1	Cerebral oedema	09	03	02	02	08	24
		37.5%	12.5%	8.3%	8.3%	33.3%	
2	Subdural haemorrhage/haematoma	02	02	-	04	04	12
		16.6%	16.6%	-	33.3%	33.3%	
3	Extradural haemorrhage/haematoma	01	-	-	04	03	08
				12.5%	50%	37%	
4	Suarachnoid haemorrhage	-	-	-	03	03	06
					50%	50%	
5	Cerebrall contusion	10	01	04	05	21	41
		24.3%	24.4%	9.7%	12.1%	51.2%	
6	Fracture skull	10	06	03	07	08	34
	29.4%	17.6%	8.8%	20.5%	23.5%	23.5%	
7	Intraventricular haemorrhage	-	-	-	-	100%	01
8	Intracerebral haematoma	-	-	-	01	01	02
					50%	50%	

Table 6
Mode of Injury in conjunction or alone producing various types of lesions

Mode of Injury	SDH	EDH	SAH	Cerebral contusion	Cerebral oeadema
Fall	04	05	01	02	16
	9%	(11.3%)	(2.2%)	50%)	(33.3%)
Road traffca accident	02	01	04	15	05
	(5%)	(2.5%)	10%)	(37.5%)	(12.5%)
Hit assaults)	05	02	01	03	02
	(42.8%)	(14.2%)	7.1%)	(21.4%)	(14.2%)
Gunshot	-	-	-	01	01
				(50%)	(50%)
Total	12	08	06	41	24

SDH = Subdural haemorrhage ; EDH = Extradural haemorrhage ;

SAH = Subarachnoid haemorrhage

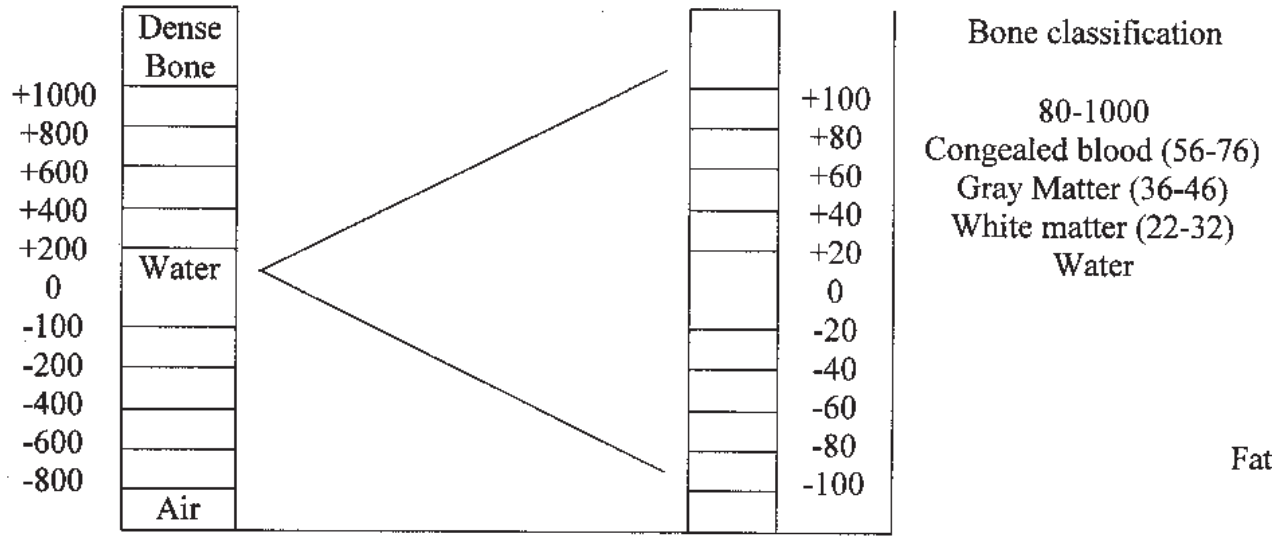

Fig. 1 The Hounsfield CT Scan, the full scale on the left extends over 2000 units. The expanded scale on the right extends over 200 units and includes all body tissues head scans are usually done routinely at a window level (L) of 34-40 and a window (W) covering 0-75.

References

1. Textbook of radiology and imaging. Ed.David Sutton. 6th edition, 1998 (Churchill Livingstone)