

Original Research Paper

Pattern of Fatal Cranio-Cerebral Injuries in Mumbai Region

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Abstract

Head injury is a leading cause of death and disability around the globe and presents a major worldwide social, economic, and health problem. With increasing civilization there is increase in road surface transport to fulfil the need of population, due to this the most common cause of head injury is vehicular accidents. Cases for present study were selected from the medico-legal autopsies, conducted at the Grant Medical College, Sir J. J. Hospital, Mumbai, during the period of 18 months, from January 2009 to August 2010. Cases (100) having a definite history of head injuries irrespective of predisposing factors, were selected for the purpose of scrutiny. From the head injury cases so scrutinized, fatal cases were isolated where the cranio-cerebral injuries alone occurred. In this study Road traffic accident is the most common cause of head injury, linear type of parietal and temporal bone fracture is mostly seen. Incidence of subarachnoid hemorrhage is most common.

Key Words: Craniocerebral injuries, Intracranial hemorrhage, Road traffic accident, Autopsy

Introduction:

The Head injuries, sustained from vehicular accident is an ever increasing trend, due to increase in population, vehicles on the road, speed, ignorance of traffic rules, avoidance of protective equipments and poor road conditions. The present work dedicated in analyzing and evaluating of head injuries because the factors responsible for it were multiple and variable.

Comprehensive study and analysis of injuries to the head in respect to situation, number, size, severity, extent and pattern, by the autopsy surgeon depicts ideas about the manner of infliction. After vehicular accidents, head injury due to fall is the 2nd most common cause of cranio-cerebral trauma leading to death.

Material and Method:

The present prospective study includes total 100 autopsy cases of head injury admitted in Grant Medical College, Sir J.J. Hospital Mumbai during the period of 18 months from January 2009 to August 2010.

Mainly the cases having fatal type of craniocerebral injuries were selected. General information of each case & autopsy findings entered in Performa & then tabulated to retrieve the relevant data for observation & compare with various previous studies. In this study main considered parameters included are the injury pattern of scalp, skull, meninges i.e. intracranial spaces and brain substance.

Observations and Result:

The present study of 100 cases of cranio-cerebral injuries in Sir J.J. Hospital reveals that head injury is the commonest cause of death in road traffic accident. (Fig. 1)

Most common location of external injury to scalp in cranio-cerebral injury was temporal region (29%). (Table 1) In this study, highest incidence of cranio-cerebral injury seen during the 3rd and 4th decade followed by 5th and 6th decade of life. (Fig. 2) Incidences of fatal cranio-cerebral injuries are more common in males than females. (Fig. 3)

Most of the cases (48%) of cranio-cerebral injury came to hospital within 30 minutes of incidence. Out of 100 cases, 39% cases were brought dead and survival period of 31% cases were more than 4 days. (Fig. 4)

Incidence of subarachnoid hemorrhage (50.90%) is most common followed by subdural hemorrhage (28.50%) and least common is Intraventricular hemorrhage (1.8%). (Table 3)

C.T. Scan was done in 38 admitted cases, out of which subarachnoid hemorrhage was detected in 45.80% of cases and subdural hemorrhage in 30.50% of cases. (Fig. 5) Vault

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(39%) is most commonly fractured in cranio-cerebral injury cases followed by base of skull (5%). However no fracture was detected in 52% cases. Linear type of vault fracture (74.50%) is most common, depressed fracture (14.30%) comes next in order. (Table 2)

Discussion:

Present study showed that the most common cause of cranio-cerebral injuries is road traffic accident. Similar findings were seen in Kalyanraman et al [1] and Sambasivan et al studies. [2] This is possible due to marked expansion of the city, ignorance of traffic rules, over-crowding, rapid increase in the number of vehicles playing on congested roads and avoidance of helmets resulting in frequent traffic accidents.

In this study higher incidence of cranio-cerebral injuries has been noted in 3rd and 4th decades (41%), which correlates with Lalwani S et al. [3] This is because of adult population lives an active life which predisposes them to accidents causing cranio-cerebral injury.

In general cranio-cerebral injury is more common in males (84%). The rate of accidents is related to driving and activities outside the house. [3] In our study most common location of external injury to scalp in cranio-cerebral injury was temporal region (29%), this result is similar to the ones made by Panigrahi et al. [4]

The scalp laceration may give a clue as to how the wound occurred or was inflicted. Scalp contusion colour gives idea about time since injury. The maximum cases were of simple linear fracture of vault in this study. Parietal bone fracture is seen in 25% cases, temporal in 21% of cases. Linear fracture (81.25%) is the commonest kind of skull fracture as revealed in our study that correlates closely with Yakamin et al [5] as 89% and Nicol et al. [6]

These facts are explained on the basis of the temporal bone involvement mostly due to its thin structure and maximum exposure. Parietal bone involvement in fall can be explained mainly due to the prominences and elevations of parietal bone of skull and also the mode of fall occurring in different circumstances.

Our findings of maximum involvement of parietal bone are similar with the findings of other authors. [6, 7] The observations of the present study of (9.70%) cases of extradural hemorrhage are quite comparable with the study of Galbraith et al (14.6%). [8] The finding of subdural hemorrhage (28.50%) in present study is similar with the findings of Das and Ray et al (SDH-28.01%). [9] The dating of the subdural hemorrhage has great medico-legal importance.

There may have been one or more episodes of trauma on record, any of which may have criminal or civil connotations. Our findings are similar with the findings of Pathak et al [10] i.e. Subdural and subarachnoid hemorrhages are found in maximum number of cases and extradural hemorrhages are found in minimal number of cases.

The finding of subarachnoid hemorrhage (50.90%) in the present study is correlates with other studies. [11] i.e. subarachnoid hemorrhage is the commonest type of intracranial hemorrhage.

Traumatic subarachnoid hemorrhage contrasts with effusions of other etiology (ruptured aneurism, secondary effusions from hemorrhage into the ventricles) which are characteristically found at the base of brain.

Out of 100 cases of cranio-cerebral injury, in 64 cases cause of death was found to be Head injury in our study. The result is similar to the study of Harnam Singh and Agarwal AD. [12]

Conclusion:

Commonest cause of cranio-cerebral injury is road traffic accident. Fall from height, railway accidents, assaults came next in order. Incidences of cranio-cerebral injuries are more common in younger age groups and mostly in males. Right temporal is the most common region involved in external injury to scalp.

Parietal and Temporal bone fractures are more common. Linear fracture of skull is the commonest, depressed fracture comes next in order. Incidence of Subarachnoid hemorrhage is highest. Most of the head injury cases are accidental, the reason being the overcrowding narrow roads, non existence of separate footpath, lack of traffic knowledge and the careless driving often in intoxicated state.

Prevention of fatal head injuries can only be done by taking stringent measures in implementing traffic rules among the various categories of road users, improvement of road surface infrastructure, rapid emergency services & establishment of trauma care centers are major factors to reduce this hazard.

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Fig. 1: Manner of Injury among Cases of Cranio-Cerebral Injury

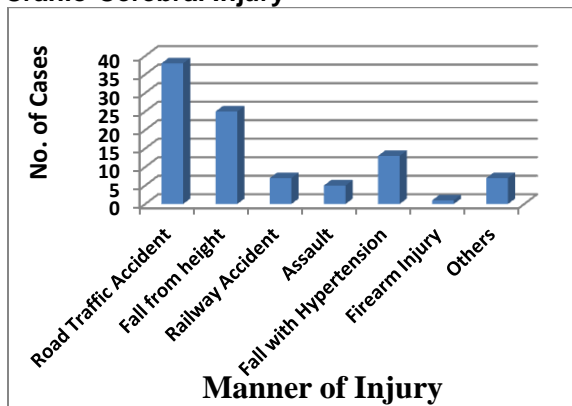


Fig. 2: Cause of Death on Autopsy among Cases of Cranio-Cerebral Injury

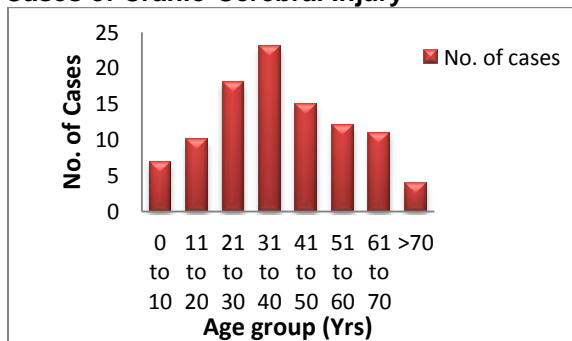


Fig. 3: Gender Wise Distribution of Cranio-Cerebral Injury Cases

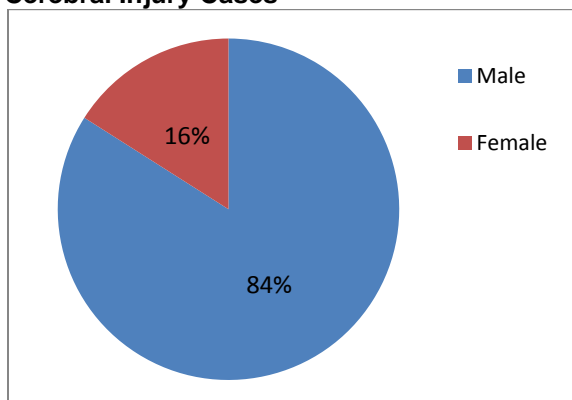


Fig. 4: Survival Period Cranio-Cerebral Injury Cases

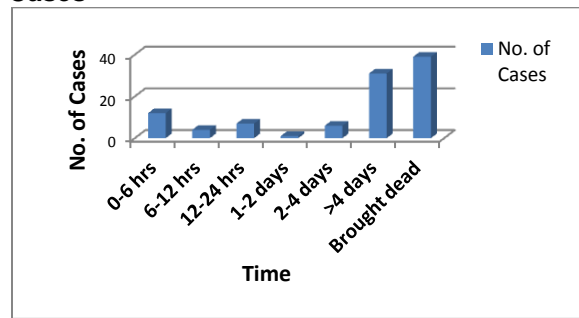


Fig. 5: CT scan Report of Cranio-Cerebral Injury Cases

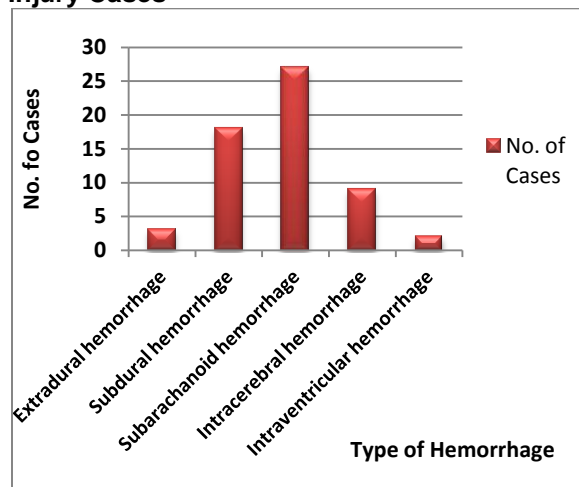


Table 1: Site of External Injury to Scalp among Cranio-Cerebral Injury Cases

Scalp Area	Side		Total
	Right	Left	
Frontal	6	2	8
Parietal	8	2	10
Temporal	18	11	29
Occipital	8	2	10
Total	40	17	57

Table 2: Skull Fracture Distribution among Fatal Cranio-Cerebral Injury Cases

Type of skull fracture	Cases	Percentage
Vault	39	39
Base	5	5
Combination	4	4
No fracture	52	52
Total	100	100

Table 3: Incidence of Various Types of Intracranial Hemorrhage

Type of Hemorrhage	Cases	Percentage
Extradural	16	9.70
Sub dural	47	28.50
Subarachnoid	84	50.90
Intracerebral	15	9.10
Intraventricular	3	1.80
Total	*165	100