

An Analysis of Pattern of Fatal Head Injuries in Road Traffic Accidents

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ABSTRACT

One of the common regional injuries an individual can sustain in Road Traffic Accidents is head injury. Head and face is the region which is more susceptible and requires an immediate care and treatment. The fatality rate is high even with intense treatment. Law making agencies has been continuously trying to enforce the rules of wearing helmets both in riders and pillion in two wheelers. Considering the same, this study was done in eastern part of Bangalore, an IT hub and a rapidly developing area with increase in vehicular movements. The study concluded that incidence was common among age group of 21-30 years with male predominance and among two wheel riders. Laceration is most common external injury followed by abrasion. Fissure fractures are most common type of Fracture, and sub dural haemorrhage is seen in majority of cases.

Keywords: Road Traffic Accidents, Head Injuries, Fatality, Subdural Hemorrhage.

INTRODUCTION

Traumatic brain injury (TBI) is a significant public health problem leading to mortality, morbidity, and socioeconomic losses in India. The majority (60%) of TBI cases are a result of road traffic accidents (RTA).¹ Head injury is a morbid state where there are gross or subtle structural changes in scalp vault and or the content of the skull. The application of blunt force may result in injury to the skull and its contents.² As per History head trauma did not take long to be realized by human, the head has always been seen by both assailant and defender as a region of particular vulnerability, where an incapacitating blow might most effectively be

landed. This is well attested by the creation of protective helmet (iron hat) worn by the warriors far back in the antiquity and now as well, at war and at peace, while at work and in variety of sport- connected activities. It is learnt from heroic poems of Greek and Roman literature that the cranial wounds of antiquity did not differ a great deal in their lethal or disabling effects from the cranial wounds of our times; the change that had been seen over ages is method of injury both accidental and intentional assault, basic reason for change is continuous upgrading of “force”.³

AIMS AND OBJECTIVES OF THE STUDY

1. To know the pattern of fatal head injuries in relation to age, sex, type of road user, place of death.
2. To know the pattern of fatal head injuries in relation to cause of head injury.

MATERIALS AND METHODOLOGY

Data was collected from the medico legal autopsy reports and from inquest forms of fatal head injuries

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related to road traffic accident for a period of 5 years from September 2006 to August 2011 which were autopsied in Vydehi Hospital Mortuary. A proforma was prepared accordingly to collect the data based on the deceased's particulars, with complete external and internal examination of those involved in fatal head injuries of RTA cases. The particulars of deceased in the form of age, sex, type of road user, types of injuries, types of Fracture, Haemorrhages and cause of Death, were studied based on autopsy reports, inquest forms, information from relatives. Those cases that are not included in this study are

1. Decomposed cases with fatal head injuries, where the interpretation of injuries is not possible due to extensive decomposition.
2. Unknown cases where, the history and details are not available.
3. Intracranial hemorrhages, infarctions, lesions as a result of natural diseases.
4. Extensive burns involving head, where there is difficulty in interpretation of injuries.

OBSERVATIONS AND RESULTS

Data was collected in 184 cases with various objectives. Among 184 cases of head injuries 123 cases were those of RTA. Age of incidence broadly grouped into ten years range and Youngest case noted was that of 1 ½ years and oldest noted was 78years. Highest incidence of 42% cases was noticed in age group of 21 to 30years (Table-1). On considering sex profile 11% cases were those of females and 89% was that of male (Table-2). In road traffic accidents when data was analyzed among the type of road users, two wheeler motor vehicle occupants were maximum, which accounted for 58% cases, 37% were pedestrians, 3 % were four wheeler and 2% were other types of road users like bicycle riders (Table-3). The incidents indicate four wheeler occupants were well protected compared to other type of road users.

123cases that is 67% of cases external injuries were noticed in all the cases involving scalp and face. Most common injuries that was noticed was laceration in 51% cases followed by abrasion in 33% cases (Table-5). On considering types of fracture sustained to skull most common being fissured in 50% cases followed by comminuted fracture in 34% cases (Table-6).

On considering the bones involved facial bone is commonly involved in 11% cases in 13% cases there was involvement of facial and all vault bones (Table-7). Base of skull commonly involved middle cranial fossa fracture is involved in 17% cases, anterior cranial fossa in 10% cases combination of all fossa in 1 case (Table-8). Meningeal involvement commonly is subdural haemorrhage that is in 63% cases, subarachnoid haemorrhage is seen in 57% cases (Table-9). On considering injuries to brain contusion was commonly noticed in 20% cases, followed by laceration and contusion (Table-10). Parietal lobe of brain is commonly involved followed by frontal bone (Table-11). Cause of death was shock and haemorrhage is most cases followed by coma, then there are other causes which includes instantaneous, respiratory failure, cerebral oedema, infection, brain stem dysfunction (Table-12).

Table 1: Age Distribution

Age of incidence	Number of cases %
1-10years	3
11-20years	11
21-30years	43
31-40years	13
41-50years	12
51-60years	08
61-70years	07
71-80years	3

Table 2: Sex Distribution

Sex profile	Number of cases %
Male	89
Female	11

Table 3: Type of Road Users

Type of road users	Number of cases %
Two wheelers	58
Pedestrians	37
Four wheeler	03
others	02

Table 4: Place of Death

Place of death	Number of cases %
Spot death	63
On the way to hospital	13
In hospital	23

Table 5: Type of Injury

Scalp and face	Number of cases %
abrasion	33
contusion	04
laceration	51
Crush injury to head	04
Healing wound	02
Suture wound	06

Table 6: Type of Skull Fractures

Type of fracture	Number of cases %
comminuted	34
Fissure	50
Depressed	11
Diastitic	02
Hinge	02
Fissure + Depressed	01

Table 7: Skull Bones Involved

Bones involved	Number of cases %
Facial	11.4
Temporal	8.1
Parietal	8.1
Frontal	8.9
Occipital	7.3
All the above bones	13

Table 8: Involvement of Base of Skull

Base of skull involvement	Number of cases %
Anterior cranial fossa(ACF)	9.7
Middle cranial fossa(MCF)	17
Posterior cranial fossa(PCF)	7
ACF + MCF	7
PCF + ACF	7
MCF + PCF	1.6
ACF + MCF + PCF	0.8

Table 9: Meningeal Involvement

Meningeal involvement	Number of cases %
Extra dural	9.7
Subdural	63.4
Subarachnoid	57.7
Intra ventricular	0.8

Table 10: Internal Brain Injury

Injury to brain	Number of cases %
Contusion	19.5
Laceration	17.8
Oedema	17.8
Drained out	10.5

Table 11: Areas of Brain Involved

Areas of brain involved	Number of cases %
Frontal	13
Temporal	12.1
Parietal	14.6
Occipital	5.7
Diffuse	8.9

Table 12: Cause of Death

Cause of death	Number of cases %
Shock and haemorrhage	54.4
Coma	22.7
others	22.7

DISCUSSION

This study was done to analyse the head injuries and it was found that the Road Traffic Accidents were the most common manner for sustenance of head injuries followed by others like homicidal and suicidal. Incidences of Head injuries due to RTA constitute about 67% which can be compared to a study which had also shown maximum of RTA cases where it constitute 40% of cases.⁴ Incidences were common in two wheelers (57%), followed by pedestrians(36%) and then four wheelers (2.4%) and others (2.4%) which are similar with the study of Jawaharlal Nehru Medical college and hospital, but in contrast with other where the incidence of pedestrian are common followed by two wheeler and others.^{5,6} The male predominance in current study and also age of occurrence of RTA being common in 20 to 30 years is consistent with the other studies⁴⁻⁷. The study can also be compared with another study done in Indore where incidences are common in male in third decade.⁸ Among the injuries to face and the head, similar results were drawn in a study where scalp laceration was noticed as the most common injury.⁷ In the present study on

considering skull fracture of the vault, it had showed the linear/ fissure fracture were the commonest accounting for 50% of cases followed by comminuted fracture in 33% of cases, this can be compared with a study done in Jaipur where they concluded linear fracture is common followed by basilar fracture and then comminuted fracture.⁹

On considering the anatomical location of the skull fracture present study had showed involvement of all bones in majority of cases followed by involvement of facial bones which is then followed by frontal involvement, in contrast to Chandigarh based study which had showed parietotemporal area being common followed by parietal area.⁷ The common meningeal haemorrhage in current study is subdural followed by subarachnoid haemorrhage, this is consistent with a previous study where the subdural haemorrhage is commonest followed by subarachnoid haemorrhage.¹⁰ Aligarh based study had showed that cerebral oedema is common followed by contusion, in contrast current study had showed the contusion is common followed by cerebral oedema and then laceration, few cases also showed complete expulsion of brain matter. The present study has also showed the parietal lobe involvement of brain common followed by frontal lobe involvement. Common cause of death that had been given in most of cases is shock and haemorrhage, followed by coma as a result of injury sustained.

CONCLUSION

Four wheeler involvements were very less which shows that it is a much safer mode of transportation. Most of cases are of spot death without receiving any treatment which will shows the importance of immediate and preliminary treatment.

Ethical Clearance: Institute Ethics Committee.

Conflict of Interests: Nil

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