

Patterns of Head Injuries (Cranio-Cerebral) in Road Traffic Accidents in Riyadh Region of KSA

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Present study was carried out in the Forensic Medicine & Mortuary department, King Saud Medical City, Riyadh, KSA on autopsy of 400 victims of road-traffic accidents (RTA) over a period of 3 years (2010 to 2012). Out of them 270 (67.5%) were having cranio-cerebral injuries. Vehicle occupant was the commonest victim group accounting of 46.25% of all the cases, then the second highest was the pedestrians of 33.5% which is a reverse findings in many developing countries studies on RTA. Males were the more involved victims than females. Most of the victims were young adults in the age group of 21 to 30 years. Commonest injuries were found to be fracture of the vault of the skull (63.33%), injury to brain (78.91%) and extradural hemorrhage (21.36%). Road safety in KSA is usually good, one way traffic but young people drive their vehicles with higher speed, increasing consumption of alcoholic beverages as well as other drugs, lack of awareness of the peoples and poor understanding of the traffic rules by the multinational citizen working in the country, although there is good medical facilities, accounts for the majority of such deaths.

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Key words: Injuries, Road traffic accidents, Saudi Arabia.

Introduction

In the present mechanized society, road-traffic accidents are increasing at an alarming rate and account for a majority of accidental deaths. Head injury is any injury that results in trauma to the scalp, skull or brain can be defined as a head injury. Vehicle accidents are one of the important common causes of traumatic head injuries. Head may strike on the windshield, dash board or steering wheel and can lead to open or closed brain injuries. Concussion or scalp injury may develop in vehicle accident.

Road-traffic accidents are one of the major causes of disability and death all over the world (WHO 1980).¹ They rank 3rd in order among the leading causes of death and are responsible for 10% of all deaths in

developing countries.² The condition has become equally grave in this developed country as road traffic accidents are increasing at an alarming rate. According to study conducted by National transportation planning and research centre, every 04 minutes a person is killed or injured in India. Behaviors of road users, vehicle characteristics and the traffic environment coupled with human errors were cited as the main cause.

The purpose of the present work is to study the pattern of cranio-cerebral head injuries sustained by the victims as they are considered to be one of the leading causes of death due to road-traffic accidents and would have a scope to compare the rates of RTA with other developing nations.³

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Methods

Study Design: This was a cross-sectional type of descriptive study conducted with a view to find out the pattern of head injuries (cranio-cerebral) among the dead victim brought in the forensic medicine center of king Saud medical city.

Study Population: The Study population was RTA death victims brought to the center for autopsy irrespective of age & sex.

Sample size & sampling technique: The sample size was for the present study consisted of 400 dead victims of road-traffic accidents brought to the department of Forensic Medicine & Mortuary at King Saud Medical City, Riyadh, KSA for autopsy during the period January 2010 to December 2012, a period of 03 years. Information regarding the age, sex and class of victim, type of vehicle involved etc. was taken by detailed interrogation with the police, relatives and friends as well as the team those who brought the corpses in the mortuary.

Data processing & analysis: Detailed examination was carried out in the mortuary and data regarding both external and internal injuries were carefully recorded, verified & then compiled and tabulated according to key variables. The data was then analyzed by a computer and presented in this paper.

Results

Vehicle occupants were the commonest group of victims to be involved in fatal accidents comprising 124(46.25%) of total cases. Pedestrians were in 90(33.5%) cases and drivers in 55 (20.25%) cases. (Fig-1)

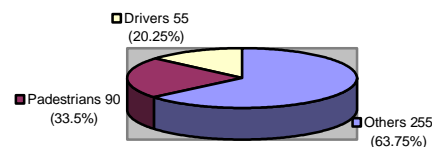


Figure 1. Victim groups and fatal head injuries

Private cars (light vehicles) were the commonest offenders, being involved in 89(59%) fatalities, followed by heavy vehicles in 59(38.8%) accidents. Two wheelers and other vehicles were responsible for 4(5%) accidents each.

Out of 270 cases of cranio-cerebral injuries 221(82.2%) were males. Male to female ratio was 4.5:1. The incidence of fatal road-traffic accidents was found to be maximum in the age group of 21 to 30 years as 105 (38.88%) victims belongs to this age group. Next common age group was 31 to 40 years as 50(18.51%) victims belongs to that age group. Lowest incidence was found in the age group of 61 and above 5.55% (Fig-2).

Study populations were 400 RTA victims & along with head injury, the other injuries were in different sites of the body shown in table I. Head injuries were the commonest and were observed in 270 cases comprising 67.50% of all injuries. Other common injuries observed were to be chest in 190(47.5%) victims, injury to abdomen in 105(25.0%) victims and injuries to lower limbs in 100(25.0%) cases (Table I).

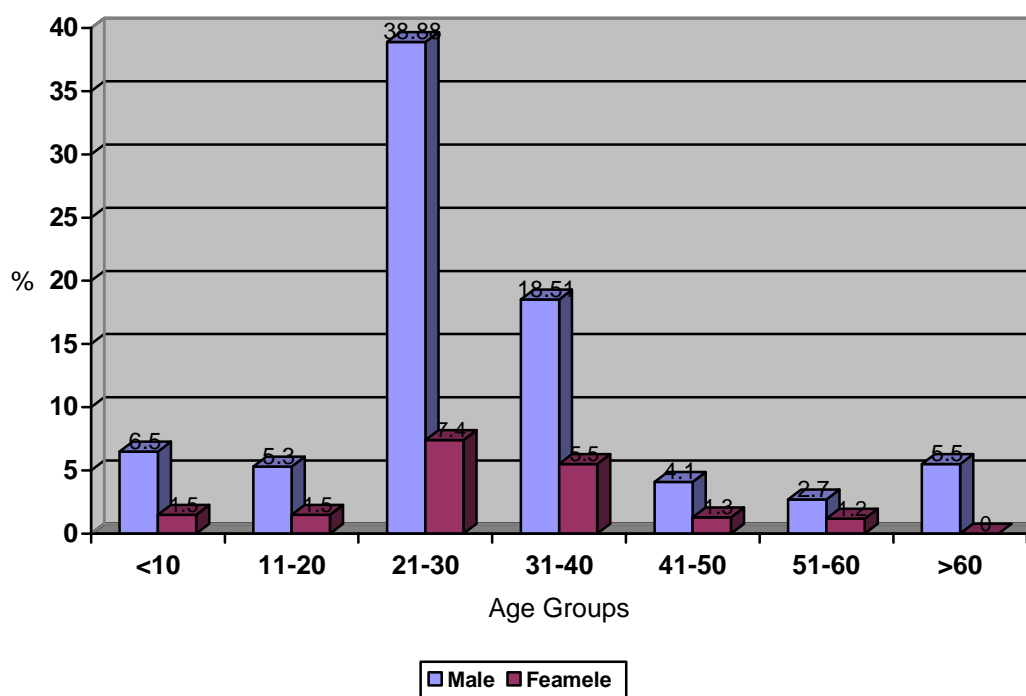


Figure 2. Age and sex wise incidence

Table I: Sites of injuries

Anatomical Site	No	Percentage
Head	270	67.5
Thorax	190	47.5
Abdomen	105	26.25
Lower limb	100	25.0
Pelvis	75	18.75
Upper limb	45	11.25
Spine	20	5.0

Fractures of the vault of the skull were found in 171(63.33%) cases, and those involving the base of the skull were found in 87(32.22%) cases. In 12(4.44%) cases, fractures involved both the vault and the base of the skull. The fronto-parietal region was the commonest site to be involved. Amongst the basal fractures, middle cranial fossa was involved in 70(25.92%) cases, anterior and posterior cranial fossa was less commonly involved. (Table II).

Table II: Site patterns of head injuries

Sites	No	%
Fracture of skull		
Vault	171	63.33
Base	87	32.22
Both	12	4.44
Site of skull fracture		
Parietal	110	43.66
Temporal	105	38.75
Frontal	100	37.05
Occipital	95	34.42
Middle cranial fossa	70	25.92
Anterior cranial fossa	35	12.94
Posterior cranial fossa	35	12.95

Eighty five cases had 3 injuries in skull, 110 cases had 2 injuries in skull.

Contusions of brain either alone or in combination with various types of fracture of the skull were found in 90(33.34%) cases, whereas lacerations and combinations of contusions and lacerations were found in 60(24.20%) and 55(21.37%) cases

respectively (Table III). Various intracranial hemorrhages were also observed, commonest being extradural found in 55(21.36%) cases followed by sub-dural hemorrhages found in 40(14.75%) cases. sub-arachnoid and intracerebral hemorrhages were found in 20(7.37%) and 10(3.68%) cases respectively. Combination of two or more varieties was observed in 35(12.90%) cases.

Table III: Natures of head injury

Injury	No	%
Injury to brain		
Contusion	90	33.34
Laceration	60	24.20
Both	55	21.37
Intracranial haemorrhage		
Extradural	55	21.37
Subdural	40	14.75
Subarachnoid	20	07.37
Intracerebral	10	03.68
Combination	35	12.90
Injury to brain	20	12.90

The spinal cord injuries were found in 20 (07.37%) cases, where lower cervical and upper thoracic vertebrae were more commonly involved.

Discussion

The incidence of fatal road-traffic accidents has been steadily increasing in the recent past causing a serious increasing threat to human life and property.

In the present study, vehicle occupants were the commonest victims constituting 46.25% of all road-traffic fatalities. In developing countries observations found that, pedestrians were the commonest victims as found by Balogun J A, Abereoje O k.⁴ Heavy vehicles, like buses, trucks and trolleys were the frequent source. Also agreed by studies conducted by Shrivastav A k. In KSA the private cars (light vehicle) were the vehicles frequently fall in accidents, so the vehicle

occupants are the commonest victims as found in this study.

It was observed that there was a preponderance of males over female victims in the ratio 4.5:1 and maximum number of victims were young adults, as they are active in day to day outdoor life and hence exposed to greater risk as compared to persons belongs to other age groups. This findings also correlates with the studies carried out by Ghosh P K, & Michael J Shkrun.^{5,6}

The present study indicates that head injury was commonest (67.5%), followed by injury to the chest (47.5%). Ghosh (1991) observed similar figures of 62.22% and 48.2% respectively. Several workers as Michael J Shkrun & Shrivastava A K, also quote comparable figures for incidence of head injury in road-traffic accidents.^{3,6}

Road accidents are the result of the interaction between road users, vehicles and the road environment. As multiple factors are responsible for causing accidents, the problem requires a multidirectional approach to reduce the rate of incidence and thus reduce the death rate and sufferings of the injured victims. This should be aimed at maintenance of healthy road environment and administration of education to the public at large regarding proper traffic sense and proper enforcement of traffic rules.

Conclusion

The present paper deals with the study of 400 victims of road-traffic accidents, out of which 270(67.5%) cases were having cranio-cerebral injuries. Males outnumbered females in ratio 4.5:1 and maximum victims were young adults belonging to the age group of 21 to 30 years. fracture of the vault of the skull were found in 63.33% cases and brain injuries in 78.91% cases. Commonest varieties of intracranial hemorrhage observed was

extradural found in 21.36% cases.

In developing countries observations found that, pedestrians were the commonest victims as found by other workers heavy vehicles, like buses, trucks & trolleys were the frequent source as agreed by study conducted by Shrivastav.³ In KSA I found private cars (light vehicles) were the vehicles fall frequently in accidents.

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