Original Article

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Pattern of Scalp Injuries in Relation to Cranio-Cerebral Trauma: An Autopsy Based Study

Sridhara Chary Rangu*, B. Lakshmi Prasanna, Bharath Kumar Reddy***, Nishat Ahmed Sheikh******

Abstract

Background: Motor vehicle crashes are a major cause of fatality all over the world. By 2020 motor vehicle injury is projected to become the third leading contributor to the global burden of disease in the world. Motor cyclists are about 25 times more likely than car occupants to die in Road Traffic Accidents. *Aim and Objective:* To Compare the scalp injuries with cranial and cerebral injuries, i.e., to know how many percent of cases of scalp injuries are associated with skull and brain injuries. *Study Design:* Cross sectional Prospective. *Place of Study:* Osmania General Hospital Mortuary Hyderabad. *Duration of Study:* From 2010 to 2012. *Material and Method:* The subjects for the study were all cases of head injury due to blunt trauma whether admitted to the hospital or not, brought for medico legal autopsy during this period. Information was gathered from the relatives of the deceased or accompanying persons, police personnel, police inquest, hospital records and postmortem findings. *Observation and Discussion:* In 400 cases of head injury cases, 82% of victims are males and 18% victims are females, 88 cases remained unidentified i.e., a whipping 22 % of 400 cases. In Age group of 31-40, almost 70% of the fatalities of the 75 cases fell in under 35 year age group. The incidence in vehicular accidents is 208 of which 170 are males and 38 females. The majority of the vehicles driven by the victims were motor cycles 123 cases. 364 of the 400 cases (91%) scalp injuries co-existed along with bony and cerebral injuries. It is mentioned that external injuries may or may not be present in all cases of head injury. The view that wounds of the scalp due to blunt force must be looked upon as potentially serious no matter how they are produced.Scalp injuries are usually the result of direct impact but may not be apparent in inflicted head injuries. *Conclusion:* The subject of "scalp injury and cranio-cerebral trauma" has assumed paramount importance in recent times owing to the enormous mechanization of various aspects of life. By compiling the records of these traumas at national levelor international level can underline risk factors involved in these accidents, will be extremely helpful in the policy building and making the decisions for health promotion and health building at national or international level.

Keywords: Scalp Injury; Cranio-Cerebral Trauma; Road Traffic Accidents.

Introduction

Cranio-cerebral injuries (also known as head injuries), one of the most important regional injuries, were known to human beings since time immemorial. "Head Injury" as defined by National Advisory Neurological diseases and Stroke Council, is "a morbid state resulting from gross or subtle structural changes in the scalp, Skull and/or contents of skull, produced by mechanical forces" [1].

With the dawn of independence and launching of the development plans, India is now passing through a process of tremendous industrial revolution drawing the rural population into urban areas. Not only the urban roads have become congested with pedestrians, but the movement of goods in the plain period has made the roads unsafe. Modern craze mad race for great speed have made the situation worse. Accidental injuries have progressively and alarmingly increased with

Authors Affiliation: *Assistant Professor of Forensic Medicine, Government Medical College Nizamabad, Telangana State. **Professor, ***Assistant Professor of Forensic Medicine, Kamineni Academy of Medical Sciences and Research Center, L. B. Nagar, Hyderabad. ****Professor of Forensic Medicine, People's College of Medical Sciences and Research Center, Bhopal.

Reprints Requests: Nishat Ahmed Sheikh, Professor, Department of Forensic Medicine, People's college of Medical sciences & Research Centre, People's University Bhanpur, Bhopal, Madhya Pradesh 462037.
E-mail: drnishatsheikh@gmail.com

modernization in transport and industry[2]. With the advancement of mechanization in agriculture and other walks of life the accidental injuries in general and "head injury" in particular are bound to become a major problem in India as in the west. Additionally, craniocerebral injury is a source of major disability and psychological burden, especially in the younger and reproductive age group. Thus head injury forms an important aspect of both clinical and forensic work. From a medico legal point of view, it is essential to determine whether death occurred due to head injury or its complications, and whether any resultant intracranial lesions were due to natural or unnatural causes [3].

Aim and Objectives

Aim and Objectives of this study was to Compare the scalp injuries with cranial and cerebral injuries, i.e., to know how many percent of cases of scalp injuries are associated with skull and brain injuries.

Material and Method

The study was conducted at the postmortem centre of Osmania General Hospital Hyderabad from 2010 to 2012.The subjects for the study were all cases of head injury due to blunt trauma whether admitted to the hospital or not, brought for medico legal autopsy during this period. Information was gathered from the relatives of the deceased or accompanying persons, police personnel, police inquest, hospital records and postmortem findings. History of the incidents was studied in detail and a complete meticulous medico legal autopsy was conducted on each of these victims. When indicated, histo-pathological examination of stained sections of organs/tissues and chemical analysis of routine viscera and blood preserved at medico legal autopsy were done and the results were analyzed.All the data were reduced to tables, graphs and subsequently subjected to computer aided statistically analysis.

Observation and Discussion

The detailed postmortem examination study was conducted on 400 bodies 2 died of scalp injuries in relation to cranio-cerebral trauma. Of the 400 cases 224 patients were admitted in the hospital and received medical attention, the remaining 176 cases expired before being admitted into the hospital or before medical aid could arise at accident site. Among the dead 88 cases remained unidentified i.e., a whipping 22% of 400 cases. This percentage is baffling by any standards, this in spite of all efforts at postmortem to identifying by providing salient clues to the investigating authorities. The conclusion drawn regarding this disproportionately high amount cases going unidentified in accidental death cases when compared in the overall number of unknown cases which form only a small percentage of around 3% can be attributed to, delay in procedure initiation, Inability to adopt scientific methods, Fear of incurring expenditure, Status of the diseased (poor in appearance by examination of cloths and personal traits & belongings), Migrant population etc.

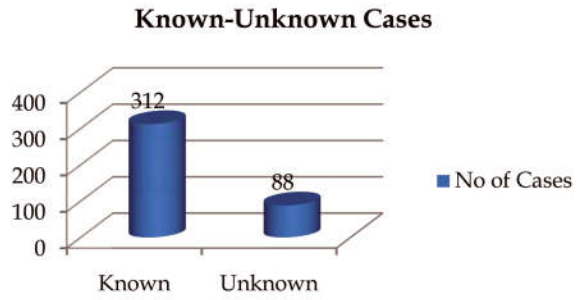

Fig. 1: Showing distribution of Known and Unknown cases

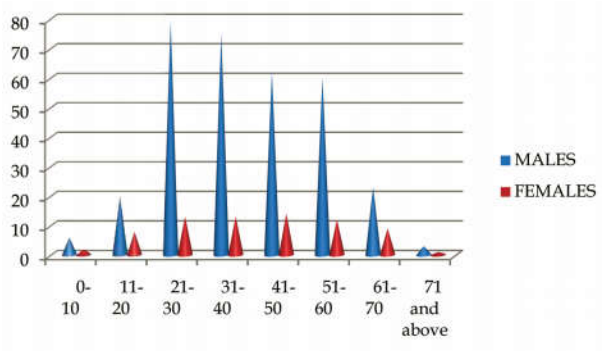

Fig. 2: Showing the sex and age group relation.

In 400 cases of head injury cases, 82% of victims are males and 18% victims are females. The facts brought out are that young adult males are the most susceptible to deaths by way of accidents [4]. The age range where most number of deaths occurred was 21 – 30 years and 31 – 40 years among males, while in females the age group of 21-60 years revealed almost similar number casualties. The men of 21-30 and 31-40 age groups reported 79 and 75 deaths respectively. In-detail analysis of the age group of 31-40, almost 70% of the fatalities of the 75 cases fell in under 35 year age group. This signifies that younger individuals in males are full of enthusiasm, bubbling with excess energy, full of zeal and zest and not averse of taking undue risks. This attitude explains the manner in which male deaths occurred

by way of self-accidents, while undertaking stunt games, speed racing, adventure sports, etc. it means that many males by themselves have become a source of self-elimination [5]. In comparison, the female gender deaths resulted purely by way of traffic accidents, while they were riding pillion or when they became victims of others rashness.

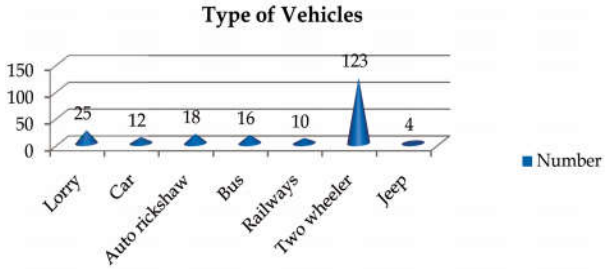

Fig. 3: Showing types of Vehicles in accidental deaths.

Out of 400 cases, 48 cases are the total number of deaths from fall from height.39 males and 9 females were involved. The incidence of falls from males to females is 16:4. The incidence in vehicular accidents is 208 of which 170 are males and 38 females. Vehicular accidents in which motor cycle are the main agencies causing the accidents. The next highest is Lorries, auto rickshaw, cars, railways. This can be explained on the basis of relative number of vehicles passing in a particular area. Contributory factors to the severity of head injuries are the speed and the mass of the vehicles. The majority of the vehicles driven by the victims were motor cycles 123 cases. In a study by Harnam Sigh et al it constituted 36.6% [6]. In the study by MartinusRitcher cars were the major collision opponents [7].

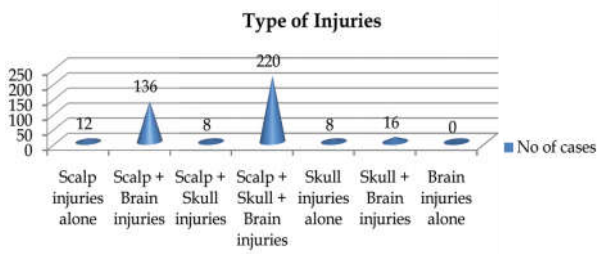

Fig. 4: Showing type of injuries

Scalp injury in association with skull and brain lesion, it was noticed conclusively that in 364 of the 400 cases (91%) scalp injuries co-existed along with bony and cerebral injuries. Scalp injury alone – this is explained that the injury to the head was not the actual cause of deaths. Only a very small percentage of deaths (3%) occurred due to injuries to various vital organs of which scalp injury was minor cause. Skull injuries alone – this again is a misnomer in a fraction of cases where major reason was nothing but transmitted injuries were found in the base of the skull and the force was transmitted from the extremities or from the neck and cervical region. Skull and Brain Injuries, the injuries also were in reality cause due to transmitted force as proposed in the earlier discussion. Brain Injury alone, this is also a very important and significant as there were no cases of brain injury alone. Gradwohl and Camps & Purchase[8] have mentioned that external injuries may or may not be present in all cases of head injury. Simpson[9] is of the view that wounds of the scalp due to blunt force must be looked upon as potentially serious no matter how they are produced. These statements hold well in the present study also.

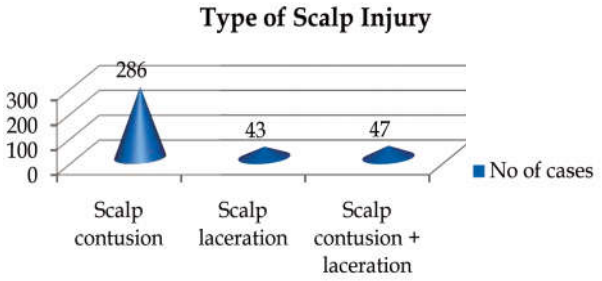

Fig. 5: Showing type of scalp injuries

The injuries listed in these particular statements are contusions, lacerations and combination of both. It lacks in that it could not demonstrate whether the aforesaid injuries are external or internal. It is also necessary to mention here that the table did not through any light on other possible manifestations of injuries viz. swelling, deformity. Contusions of the scalp are better detected by touch than sight. Scalp injuries are usually the result of direct impact but may not be apparent in inflicted head injuries. Study conducted in Delhi by Tyagi et.al. [10] reported scalp injuries to be present in 76%, while Gupta et. al. [11] reported 89% of scalp laceration. These findings are consistent with this study.

Table 1: Showing Scalp Injuries in relation to Cranial Traum. P = 0.0001373

		Scalp Injuries	
Skull Injuries		Present	Absent
	Present	228	24
	Absent	148	0

Table 2: Showing Scalp Injuries in relation to Cerebral Trauma. P = 0.00007112

		Scalp Injuries	
		Present	Absent
Cerebral Injuries	Present	356	16
	Absent	20	8

Deaths due to brain injuries are statistically more than scalp injuries. The Table 1 & 2 which reflects the categorization of injuries over scalp in relation to the brain. These tables have been constructed to derive results based on 'p' factor. It has become quite obvious on examination of these tables that death results only when there is an injury to skull and/ or brain in addition to scalp injury. skull injuries or brain injuries are sufficient to cause death but it is more or less unlikely for a scalp injury to result in death except in cases wherea severe avulsed laceration of the scalp which can produce death either due to severe hemorrhage or neurogenic shock, When an injury is a large laceration or a cut which involves all the five layers of the scalp resulting in severe uncontrolled bleeding leading to death on account of hemorrhagic shock.

Conclusion

The subject of "scalp injury and cranio-cerebral trauma" has assumed paramount importance in recent times owing to the enormous mechanization of various aspects of life, increasing instances of brutal assault and innumerable and variegated accidents in the air, in water and so on. The consequence of injury to the brain is of very great diversity and complexity and they offer many veering diagnostic problems to the clinicians and contribute often thought provoking necropsy material to the forensic pathologist. By compiling the records of these traumas at national level or international level can underline risk factors involved in these accidents, will be extremely helpful in the policy building and making the decisions for health promotion and health building at national or international level.

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Conflict of Interest

The author declares no conflict of interest in the present study

Author Disclosures

Authors have no conflict of interest. This study was a part of departmental research activities of Forensic Medicine at Kamineni Academy of Medical Sciences and Research Center, Hyderabad.

Ethical Consideration

Clearance from the Institutional Ethical committee was obtained in advance.

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