Original Article

Maxillofacial Surgery

Maxillofacial Trauma and Associated Brain Injuries

1. Tauqir-ul-Islam 2. Muhammad Junaid Lakhani 3. Hasan Mehdi 4. Atif Zubairi

1. Assoc. Prof. of Oral & Maxillofacial Surgery, Liaquat National Hospital, Karachi 2. Assoc. Prof. of Oral & Maxillofacial Surgery, JM&DC, Karachi 3. Assoc. Prof. of Oral & Maxillofacial Surgery, FJM&DC, Karachi 4. MCPS Trainee, Oral & Maxillofacial Surgery, Liaquat National Hospital, Karachi.

ABSTRACT

Objective: The aim of this study is to find out the distribution of brain injuries in patients with craniofacial trauma.
Study Design: Retrospective study
Place and Duration of Study: This study was conducted at the Departments of Oral and Maxillofacial Surgery and Neurosurgery of Liaquat National Hospital from Jan. 2010 to Dec. 2010
Materials and Methods: History form and radiographs of 112 patients who visited the Departments of Oral and Maxillofacial Surgery and Neurosurgery of Liaquat National Hospital were reviewed.
Results: Mean age of the sample was 31.7 years (+/- 8.8), minimum 18 years and maximum 65 years. The most common cause of cranio-facial trauma was road traffic accidents accounting for 94.6% followed by gunshot 2.7% fall 1.8% and assault 0.9%. Young adult males were most frequently affected.
The most common site of trauma was midface 49.5% followed by mandible 26.8%, orbit 16.1% and panfacial 8%.Brain injury was recorded in 37.8 % of patients. Contusion, concussion and direct trauma to the brain was most common in mid face fractures hemorrhage was most common in Panfacial fracture. Mean GCS score was 14.77 in Mandibular trauma, 13.17 in isolated orbital fractures12.98 in Midface trauma and 9.18 in Panfacial trauma.
Conclusion: There is a strong correlation noticed between the craniofacial trauma and brain injury in this study. Young adult males sustained most craniofacial fractures as a result of road traffic accidents. A clearer understanding of risk factors associated with road traffic accidents and strict implantation of road traffic safety measures should be emphasized to avoid serious complications. Education of oral and maxillofacial surgeons regarding brain injury and its significance in terms of neurological outcomes should be emphasized.
Key Words: Maxillofacial Trauma, Brain Injury, Traffic accidents, gunshot

INTRODUCTION

Facial fractures has high incidence of closed head injury and potential for brain injuries. The oral maxillofacial surgeon should be aware of the diagnostic process and management protocols for such patients[1].
Within the confines of face are controlling mechanisms that provide the functions of sight, hearing, smell, breathing, taste and speech. The maxillofacial region is closely related with cranial base and trauma in this region can cause injury to the cranial structures.
Maxillofacial fractures and head injuries carry a greater potential for permanent neurological deficit and mortality[2,3,4,5]. Maxillofacial trauma and associated head injury requires immediate attention. Patients with maxillofacial trauma require multidisciplinary trauma management including emergency physicians, otolaryngologist, maxillofacial surgeon and neurosurgeon.
This study will provide the epidemiological data which will help in understanding type and patterns of facial fractures and will also help maxillofacial surgeons in treatment planning and subsequent management of traumatic facial and cranial injury. It can also guide the future funding of public health programs directed toward prevention.

MATERIALS AND METHODS

History form and radiographs of 112 patients who visited the departments of Oral and Maxillofacial Surgery and Neurosurgery of Liaquat National Hospital during the period of one year starting from Jan. 2010 to Dec. 2010 were recorded.
The craniofacial fractures were categorized on the basis of age, gender, anatomic location, cause of trauma and associated brain injury.
Patients were grouped;

- According to age were grouped into three categories 16 – 25 years, 26 – 40 years and 41 – 65 years.
- Anatomic locations were grouped as mandible, midface, panfacial and isolated orbit.
- Type of brain injury was classified into:
  - Concussion
  - Contusion
  - Direct injury
  - Hemorrhage

Neurological deficit was labeled in patients with GCS < 10.
Cranial injuries were treated by Neurosurgery Department, and facial fractures were treated by the Department of Oral and Maxillofacial Surgery of Liaquat National Hospital.

RESULTS

The total number of patients in this study was 112. The 92% of the total sample size were male with a mean age of the sample was 31.7 years (+/- 8.8), minimum 18 years and maximum 65 years.

The age group ranging from 26-40 years was most commonly involved in sustaining trauma accounting for 58% of all the cases followed by 16-25 years group accounting for 28.6% and the age group 41-65 years sustained the least, accounting for 13.4% of all the cases. Table 1.

Table No.1: Descriptive Statistics – Parametric Description

Category	Parameters	Frequency	Percent
Gender	Male	103	92.0
	Female	9	8.0
	Total	112	100.0
Age Group	16 - 25 yrs.	32	28.6
	26 - 40 yrs.	65	58.0
	41 - 65 yrs.	15	13.4
Primary Site	Mandibular Fracture	30	26.8
	Midface Fracture	54	49.5
	Pan Facial Fracture	9	8.0
	Isolated Orbital Fracture	18	16.1
Etiology	Assault	1	0.9
	Fall	2	1.8
	Gunshot	3	2.7
	Road Traffic Accident	106	94.6
Neuro-logical	Deficit	40	35.7
Brain injury	No injury	70	62.5
	Contusion	14	12.5
	Concussion	5	4.5
	Direct trauma	14	12.5
	Hemorrhage	9	8.0

The most common cause of craniofacial trauma was road traffic accidents accounting for 94.6% followed by gunshot 2.7% fall 1.8% and assault 0.9%.

The most common site of trauma was midface 49.5% followed by mandible 26.8%, orbit 16.1% and panfacial 8% Chart 2.

Brain injury was recorded in 37.8 % of patients. Contusion, concussion and direct trauma to the brain was most common in mid face fractures hemorrhage was most common in Panfacial fracture Table 2. Mean GCS score was 14 in mandibular trauma, 13 in midface and isolated orbital fractures and 9 in panfacial trauma Table 2.

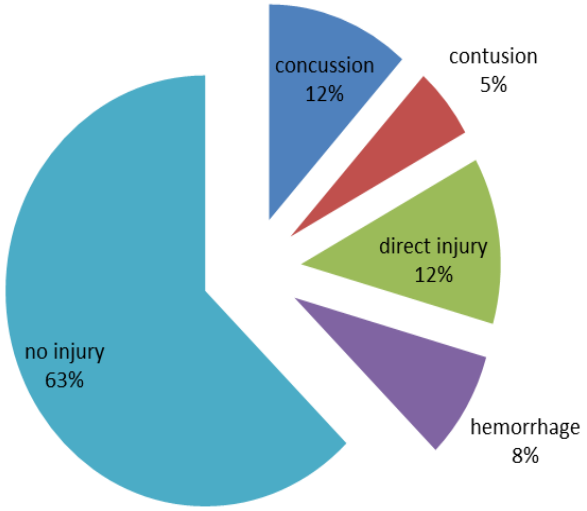

Chart No.1: Type of Brain Injury

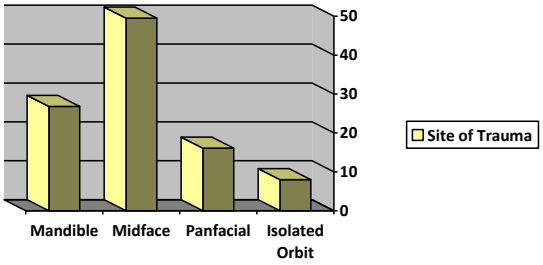

Chart No.2: Primary Trauma Sites

Table No.2: Site of trauma vs Type of Brain injury and Mean GCS

Site of Trauma	Brain Injury					
	concussion	Contusion	Direct injury	Hemorrhage	no injury	Mean GCS
Mandible	1.8%	1.8%	0.0%	0.0%	23.2%	14
Mid Face	5.4%	2.7%	7.1%	2.7%	29.5%	13
Panfacial	0.9%	0.0%	4.5%	3.6%	0.9%	9
Isolated Orbit	3.6%	0.9%	0.9%	1.8%	8.9%	13

DISCUSSION

In our study young adult males were reported to be most susceptible to craniofacial trauma. This high incidence of trauma in male gender can be because of the fact that males are engaged in high-risk activities, making them more susceptible to injury[6,7,8]. Road traffic accident was reported as the most common cause

of craniofacial trauma in our study and there are similar results shown in literature for studies done on urban population[9,10,11]. Midface fractures were the most common facial fractures followed by mandible, orbital and panfacial fractures. Similar finding were seen in the study done by Motamedi et al in 2003[12].

Craniofacial fractures, caused by RTA have a high risk ruptures of intracranial vessels, which may lead to life-threatening intracranial hemorrhages. In our study 3.6 % of panfacial fractures were associated with hemorrhage[13]. In this series, 37.8% patients sustain moderate or severe head injury reflecting he severity and complexity of craniofacial trauma. In this study, the mean GCS score was 14 with minimum score of 9 being associated with Panfacial fractures.

Facial fractures may present as serious injuries, but their treatment is often delayed until all life-threatening problems, such as the establishment of airway, breathing, and circulation and other more serious injuries of the head, chest and skeleton are managed[14].

Brain injury affects approximately one in five patients who sustain facial fractures[15]. The high incidence of brain injuries in the facial trauma population makes it mediatory for the oral and maxillofacial surgeon to acquire complete insight of the presentation and management of such cases.

CONCLUSION

There is a strong correlation noticed between the craniofacial trauma and brain injury in this study. Young adult males sustained most craniofacial fractures as a result of road traffic accidents. A clearer understanding of risk factors associated with road traffic accidents and strict implantation of road traffic safety measures should be emphasized to avoid serious complications. Education of oral and maxillofacial surgeons regarding brain injury and its significance in terms of neurological outcomes should be emphasized.

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Address for Corresponding Author:
Dr. Shah Muhammad Noonari
Medical Advisor / Associate Professor of Surgery
Sindh Employees Social Security (Head Office)
Near NIPA Chowrangi, Gulshan-e-Iqbal, Karachi.
Phone: +92-3332125594
Email: salaln49@hotmail.com