

Original Research Article

Etiologies of zygomatic bone fracture at a tertiary care hospital of South Punjab, Pakistan

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ABSTRACT

Background: Fracture of the zygomatic bone is a frequent maxillofacial trauma, due to its distinction which influences it to bear the brunt of facial trauma but its pattern seems to vary geographically. This study was planned to find out etiologies of zygomatic bone fracture at a tertiary care hospital of South Punjab, Pakistan.

Methods: This descriptive observational study was conducted at The Department of Oral and Dental Surgery, Shaikh zayed Medical College Hospital Rahim Yar Khan, Pakistan, from July December 2017. A total of 114 patients with isolated tripod zygomatic bone fracture were enrolled. Demographic characteristics of the patients along with etiologies of zygomatic bone fracture were recorded.

Results: Out of a total of 114 patients having zygomatic bone fractures, there were 85 (74.6%) male. Majority of the patients, 58 (50.9%) were aged between 21 to 30 years, 78 (68.4%) belonged to rural areas, 42 (36.8%) laborers while socio-economic class of 66 (57.9%) patients was recorded to be middle income. Road traffic accidents were the commonest, seen among 48 (42.1%) patients followed by inter-personal violence and falls, noted among 26 (22.8%) and 17 (14.9%) patients respectively.

Conclusions: Zygomatic bone fractures were most commonly seen among male gender and young age groups. Road traffic accidents and inter-personal violence were the most commonly noted etiologies in the present study.

Keywords: Zygomatic bone fracture, Road traffic accidents, Inter-personal violence

INTRODUCTION

The Zygomatic fractures constitute the second leading facial skeleton fractures, after fractures in the nasal bone.^{1,2} Zygomatic bone contributes significantly to the strength and stability of the mid face. Zygoma is a strong buttress of lateral portion of middle third of facial skeleton and it forms the cheek prominence, part of the lateral and inferior

orbital rim and the orbital floor. Due to its prominent position it is frequently subjected to fracture and dislocation either alone or in combination with other structures of midface such as maxilla, nasoethmoidal and orbital area.³ Zygomatic complex is important in the function of the globe, facial symmetry and also gives passage to infra orbital nerve that innervates the mid facial region. Fractures of zygomatic complex are among the

most frequent in maxillofacial trauma and are involved in 42% of facial fractures and accounts for 64% of all middle third fracture.⁴

The architectural pattern of the zygomatic bone allows it to withstand blows of great forces without fracturing. Fractures of zygomatico-maxillary complex are one of the most common types of maxillofacial injuries to treat.⁵ The information about the incidence, etiology, age and gender concerning this type of fractures varies according to the social, economic, cultural and environmental factors.¹

Most of the cases of zygomatic fractures indicate a predilection for males to females.⁶ Variety of etiologies including aggressions, road traffic accident (RTA), falls, industrial accidents and sports are important factors for this injury.⁷ The diagnosis is made through clinical examination and adequate radiological evaluation. Plain radiograph commonly used is Occipito- mental or Water’s view which can clearly demonstrates the bone discontinuity in the zygomaticomaxillary buttress, infraorbital rim and frontozygomatic region. The submentovertex view more clearly detects fracture of the zygomatic arch.⁸

Fracture of the zygomatic bone is a frequent maxillofacial trauma, due to its distinction which influences it to bear the brunt of facial trauma but its pattern seems to vary geographically. Fracture pattern seems to vary from simple to comminuted and from minimally displaced to severely displaced depending on the impact of injuries sustained by various modes. Rahim Yar Khan is predominantly a rural district lying in South Punjab of Pakistan. This study was planned to find out etiologies of zygomatic bone fracture at a tertiary care hospital of Rahim Yar Khan, South Punjab, Pakistan.

METHODS

This descriptive observational study was conducted at The Department of Oral and Dental Surgery, Shaikh zayed Medical College Hospital Rahim Yar Khan, Pakistan, from July December 2017. The study was approved by Institutional Ethical Committee.

A total of 114 patients with isolated tripod zygomatic bone fracture were enrolled. Informed consent was taken from all the patients or their guardians. Patients having bony diseases (Metabolic, Neoplastic and inflammatory), or already treated zygomatic bone fracture, or immunocompromised patients, or all those who had comminuted zygoma fracture, were excluded. A special proforma was designed to record all the study information. The diagnosis was established after clinical and radiological examination. Routine radiographs of zygoma fracture; occipitomenal and submentovertex views were done. O.P.G was also taken to see the impingement of zygomatic arch over the coronoid process. A 3 D C.T scan was advised.

The data was entered and analyzed using Statistical package for social sciences (SPSS) version 26.0. Qualitative data like gender, area of residence, occupation, socio-economic class, site of fracutre and etiologies were represented as frequencies and percentages. Quantitative data like age was calculated as mean and standard deviation.

RESULTS

Out of a total of 114 patients having zygomatic bone fractures, there were 85 (74.6%) male and 29 (25.4%) female. Majority of the patients, 58 (50.9%) were aged between 21 to 30 years while 65 (57.0%) were aged less than or equal to 30 years. Mean age was found to be 31.21+8.4 years. Most of the patients, 78 (68.4%) belonged to rural areas of residence. Most common occupation was noted to be laborers 42 (36.8%). Socio-economic class of 66 (57.9%) patients was recorded to be middle income. Left side was as noted to be involved site of fracture in 64 (56.1%) patients while 50 (43.9%) patients had involvement of the right side. Table 1 is showing characteristics of all the enrolled patients having zygomatic bone fractures in the present study.

Table 1: Characteristics of the patients with zygomatic bone fracture (n=114).

Characteristics	Number (%)	
Gender	Male	85 (74.6)
	Female	29 (25.4)
Age (years)	<20	7 (6.1)
	21-30	58 (50.9)
	31-40	27 (23.7)
	41-50	18 (15.8)
	50+	4 (3.5)
Area of Residence	Rural	78 (68.4)
	Urban	36 (31.6)
Occupation	Laborers	42 (36.8)
	Farmers	17 (14.9)
	Students	34 (29.8)
	Drivers	12 (10.5)
	Housewives	9 (7.9)
Socio-economic Class	Upper (>PKR. 50000)	14 (12.3)
	Middle (PKR. 25000-50000)	66 (57.9)
	Low (<PKR. 25000)	34 (29.8)
Site of Fracture	Left	64 (56.1)
	Right	50 (43.9)

Figure 1 is highlighting pattern of various kinds of etiologies observed among the patients of this study. Road traffic accidents were the commonest, seen among 48 (42.1%) patients followed by inter-personal violence and falls, noted among 26 (22.8%) and 17 (14.9%) patients respectively.

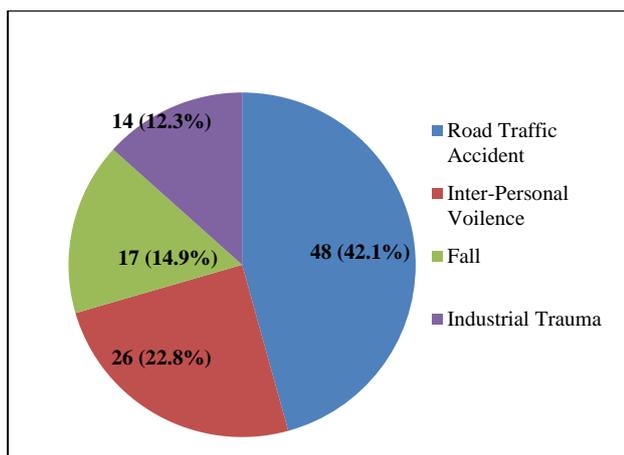


Figure 1: Etiology of zygomatic bone fracture in the present study.

DISCUSSION

The zygomatic bone is the principal buttress between the cranium and the maxilla. It plays a key role in structure, function and aesthetics of the facial skeleton. It also provides a normal cheek contour and separates the orbital contents from the temporal fossa and the maxillary sinus.⁹ Its convex shape and protrusion makes it more vulnerable to fracture in facial trauma. Thus, this malar bone fracture is the second most common fracture of the facial skeleton after nasal bone fracture.¹⁰

In the present study, we noted that the predominant age group was mainly found to be in the third decade of life (50.9%). This was a common finding in many of the previous studies which revealed that most of the patients of zygoma fracture were between 21-30 years of age.^{11,12} The high incidence in third decade of life might be due to the fact that people belonging to this age group are more practical, active and energetic. Moreover, they take active participation in sports and outdoor activities and also involved in violence.¹³ The second large group of this study constituted of fourth decade of life (23.7%).

We found that 74.6% of the patients were male showing a male to female ratio of 2.9:1. Lawrence et al reported a male to female ratio of 2:1 and Zahoor et al as 2.6:1.^{14,15} The high ratio of male pattern may be due to the engagement of males in outdoor activities, thus they are more susceptible to trauma, while females are supposed to be involved in domestic chores having fewer chances of exposure to accidental incidents like road traffic accidents in our society.

Occupation of the patients in this study depicts that there were 36.8% laborers. The laborers group faced more trauma as they mostly come from rural or nearby towns, travels in the public transport and encounter road traffic accidents. There were also 14.9% farmers reported in our study facing the trauma that could be due to unawareness of pedestrian rules and regulations of traffic as they come

from nearby rural areas for their daily needs in the big cities. Students also formed 29.8% of the study population as students seem to be careless, reckless, emotional, energetic and fond of motorcycle- wheeling so they more exposed to fall and interpersonal violence.

In terms of etiology, rate of road traffic accident was 42.1% in this study. The etiology of facial fractures has changed over decades and continue to do so.¹⁶ The developed countries show a striking reduction in broad category in road traffic accidents and increased influence of inter personal violence. However, road traffic accident was the most common cause of the zygomatic bone fracture in present study. Similar high percentage of road traffic accidents were reported by Chowdhury and Menon³ 86.20% while Obuekwe et al noted this to be 81%.¹⁷ However, Zingg et al 29% reported interpersonal violence as the leading cause of zygomatic fracture.¹⁸ Gomes et al reported accidental self fall as 21.83% as a most common cause of zygomatic fracture.¹⁹ Road traffic accidents (RTA) kill more than 1.7 million people a year and injure or disable between 20 and 50 millions more. According to the World Health Organization and World Bank data these injuries are likely to rise in the future.²⁰ For 66% living in the rural part of the country, poverty, illiteracy and inadequately organized healthcare compound already slowing down progress in health indicators.²¹

We also noticed that 7.9% housewives with zygoma fracture that could be due to scolding amongst women and spouses, poor socio-economic status and low literacy rate in our society. Such a ratio of domestic violence in Pakistan is also correlated with the study of Fikree et al who reported it to be 15%.²² Progressive violence, the quickening pace of life and transport facilities development, has a significant role in an increased number of traumas. The etiologies of zygomatic complex fracture are different in various parts of the world: depending upon the social set up, type of industry, traffic sense and legislative measures.²³

CONCLUSION

Zygomatic bone fractures were most commonly seen among male gender and young age groups. Road traffic accidents and inter-personal violence were the most commonly noted etiologies.

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