

Original Article

Zygomatic Complex Fractures in Patients with Oral and Maxillofacial Trauma; Prevalence and Causes at a Tertiary Care Center

Zygomatic
Complex
Fractures in
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ABSTRACT

Objective: To find out the prevalence and causes of zygomatic complex fractures in patients with oral and maxillofacial trauma at a tertiary care center.

Study Design: Cross sectional study.

Place and Duration of Study: This study was conducted at the Oral Biology / Oral Medicine, Bakhtawar Amin Medical and Dental College, Multan from March 2023 to May 2024.

Methods: A total of 120 patients from the outpatient department who presented with oral and maxillofacial injuries and were of either gender were included in this research and on contrary the individuals who presented with injuries from bomb blasts or gunshot wounds were excluded from the study. All the data was analyzed by using SPSS Version 22.

Results: A total of 120 individuals who presented with maxillofacial trauma were studied. The patients' average age was 31.522 years. The age group of 20 to 30 years old comprised the majority of patients in our research, making approximately 62% of all patients. There were 12.5% of patients in the age category of 31 to 40 years old and 25% of patients in the age group of 41 to 50 years old. Gender distribution showed that there was a preponderance of male patients, making up 75% of the total count while female patients made up 25% of it. 40 cases (33.3%) of zygomatic complex fractures were reported. The most prevalent etiology of zygomatic complex fractures was road traffic accidents 18 (45%) cases, followed by falls from heights, 13 (32.5%) cases. Since the majority of patients with zygomatic traumas were in the demographic range of 20 to 30, we found that this was the most susceptible age group for zygomatic complex fractures ($p < 0.05$). The gender-wise correlation with zygomatic fractures showed that, in comparison to female gender, male gender was more affected ($p < 0.05$).

Conclusion: Our research leads us to the conclusion that traffic accidents are the most frequent etiological cause for zygomaticomaxillary complex fractures.

Key Words: Road Traffic Accidents, Zygomatic bone, Fractures, Maxilla, Mid-facial complex

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INTRODUCTION

Maxillofacial trauma is among the most widely recognized cause of bony fractures of the facial skeleton for both the medical professionals and hospital based procedures, but they are frequently overlooked in the course of the first assessment⁽¹⁾.

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With an array of etiologies and treatment modalities in both developed and developing countries, the zygomatic bone is a vital component of the face for both functional and aesthetic reasons⁽²⁾. The cause of injuries to the maxilla receives very little attention in the discipline of trauma in general, despite a fact that injuries to the head, neck, and face are still relatively common⁽³⁾. The initial cause is influenced by the economic, social and environmental factors⁽⁴⁾. The most common of facial fractures are nasal apparatus fractures followed by fractures of zygomaticomaxillary complex, which come in second. At one end, the integrity of zygomaticomaxillary complex is essential for eye protection, on the other hand it also plays a role in the formation of the orbital cavity, maxillary sinus, temporal fossa and zygomatic arch⁽⁵⁾. There exists variability in the frequency and reasoning for maxillofacial fractures both globally and also within one nation due to social, cultural and environmental factors unique to that particular socioeconomic group^(7,6). In earlier studies, it was found that the traffic

accidents were the main etiological cause for maxillofacial injuries⁽⁸⁾. Pain, sensory deficit, ecchymosis, a flattened malar arch, periorbital wounds, displacement of the palpebral fissure, corneal bleeding, diplopia and exophthalmos are just a few of the indicators and symptoms associated with zygomatic complex fractures⁽⁹⁾. Radiological examination methods such as occipito-mental view, sub-mentovertex view and computerized CT scan with reconstruction are capable of identifying such fractures. Different methods of treatment for zygomatic maxillary complex fractures have been created, depending on the degree of the dislocation of the zygomatic bone. They entail open reduction, different levels of exposure, fixation, and typical conservative treatments⁽¹⁰⁻¹²⁾. The zygomatic bone is one of the pivotal components of the viscerocranium which defines the face form and shape. In order to fully understand the functional and cosmetic implications of zygomatic complex injuries, appropriate examination and treatments are necessary⁽⁹⁾.

This study aimed to identify the most frequent causes of zygomatico-maxillary complex fractures which will help the medical and dental practitioners to adopt appropriate measures which will in turn substantially decrease the risks associated with such fractures.

METHODS

The current study was conducted from March 2023 to May 2024. A total of 120 patients from the outpatient department who presented with oral and maxillofacial injuries and were of either gender were included in this study. Individuals who presented with injuries from bomb blasts or gunshot wounds were excluded from the research. For the research, non-probability sequential sampling was used to incorporate patients. A thorough oral clinical examination and radiographic evaluation were performed on each patient. On a pre-made proforma, all the information was entered, including the age, gender and side of the fracture as well as the etiological variables. With a 6% margin of error, a 95%

confidence interval, and a 12.3% historical frequency of interpersonal violence, the open epi web-based sample size calculator was used to determine the sample size, which came out to be 120. IBM SPSS Version 22 was used for data analysis. The age-related mean and standard deviations were figured. For categorical variables, percentages and frequencies were used. The Chi-Square test was used to evaluate the relationship between categorical variables, with $p < 0.05$ being considered statistically significant.

RESULTS

A total of 120 patients who presented with maxillofacial trauma were studied. The patients' average age was 31.522 years. The age group of 20 to 30 years comprised the majority of the patients in our research, making approximately 62% of all patients. There were 12.5% of patients in the age category of 31 to 40 years and 25% of patients in the age group of 41 to 50 years old. Gender distribution showed that there was a preponderance of male patients, making up to 75% of the total patients while female patients made up to 25% of this count. 40 cases (33.3%) of zygomatic complex fractures were reported. The most prevalent etiology of zygomatic complex fractures was road traffic accidents, accounting for 18 (45%) cases, followed by falls from heights, accounting for 13 (32.5%) cases. Table 1 shows the remainder of the etiological patterns. In terms of the side of the fracture, 60% of patients had the right side involved, 30% had the left side involved, and 10% had both sides fractured. Since the majority of patients with zygomatic traumas were in the demographic range of 20 to 30, we found that this was the most susceptible age group for zygomatic complex fractures ($p < 0.05$) (Table 2). The gender-wise correlation with zygomatic fracture showed that, in comparison to female gender, male gender was more affected ($p < 0.05$) (Graph 1)

Association of zygomatic complex fractures with gender

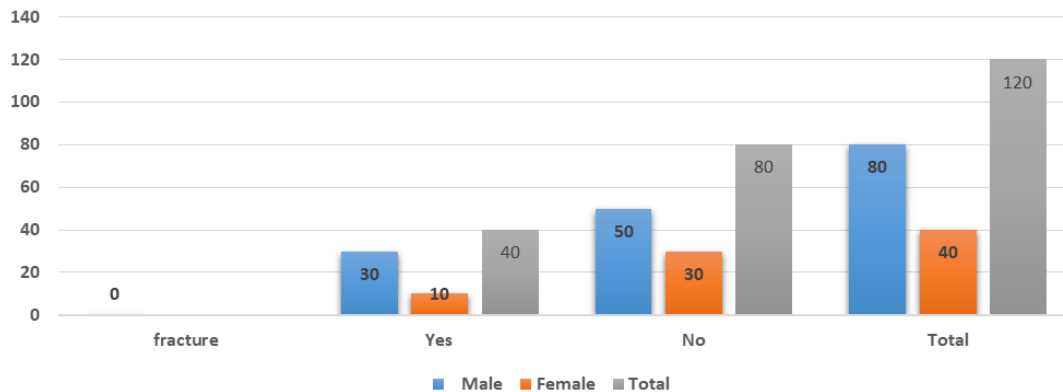


Figure No. 1: Gender-wise correlation with zygomatic fractures

Table No. 1: Etiology of zygomatic complex fractures

Zygomatic complex fractures	Etiology					Total
	Road traffic accidents	Fall from height	Emotional violence	Game injury	Additional	
Yes	18 (45%)	13 (32.5%)	4 (10%)	4 (10%)	1 (2.5%)	40 (33.3%)
No	35 (43.5%)	30 (37.5%)	7 (8.75%)	7 (8.75%)	1 (1.25%)	80 (66.7%)
Total	53	43	11	11	2	120

Table No. 2: Association of zygomatic complex fractures with age

Zygomatic complex fracture	Age distribution				p-value
	20-30 years	31-40 years	41-50 years	Total	
Yes	25 (62%)	5 (12.5%)	10 (25%)	40	0.01
No	40 (50%)	30 (37.5%)	10 (12.5%)	80	
Total	65	35	20	120	

DISCUSSION

The zygomaticomaxillary complex, which plays a significant role in both the function and appearance, is a vital section of the face and is particularly vulnerable to injury in the event of a trauma. As the face's vertical and horizontal support system, the zygomaticomaxillary complex is a significant and intricate facial structure. The zygoma is a strong buttress of the central part of the facial skeleton and a crucial component of the orbital floor as well as its lateral and inferior rims. Due to their central placement in the face, fractures to the maxilla, naso-ethmoidal region, and orbital area are prevalent. There are four distinct stages of the fracture complex that might result in various types of facial abnormalities. Functional problems such as paresthesia, trismus, diplopia and anti-mongoloid tilt may cause great distress to patients and often needs surgical intervention.

Out of the 120 patients who presented with maxillofacial injuries in our research, 40 (33.3%) had zygomaticomaxillary complex fractures overall. Moreover, we found that the zygomaticomaxillary complex fractures affected men more often than they affected women. This might be explained simply by the fact that men in comparison to women are more likely to experience a variety of professional and social risks in our culture, such as falls from heights, traffic accidents, assaults by others, sports injuries etc. Numerous investigations have revealed similar results, supporting the idea of male dominance in zygomaticomaxillary complex fractures. According to a research⁽¹³⁾ that was carried out in India, 98 individuals with zygomaticomaxillary complex fractures who were treated; of these patients, men made up 72.4% (n=71) and females made up 27.6% (n=27) of the total count. In terms of age groupings, we've discovered that those between the ages of 20 to 30 years were the most susceptible group to suffer from zygomaticomaxillary

complex fractures since they engage in a lot of outdoor activities. Comparatively speaking to our results, a Pakistani research⁽¹⁴⁾ similarly found that patients, particularly men in their twenties, had an increased incidence of zygomaticomaxillary complex fractures. The most frequent cause of zygomaticomaxillary complex fractures in our research was traffic accidents, which represented (45%) of all the etiologies. Falling from height was the second most prevalent cause, accounting for (32.5%) of all fractures. The percentages of sports injuries and interpersonal assault were both 10% each. Our results are in confluence with some other researches as well. According to a research done in India in 2013, zygomaticomaxillary complex fractures were mostly caused by Road Traffic Accidents (RTA) too. Similar to our results, they found that the prevalence of RTA in their sample was 57.1%, with fall from height coming in second at 16.3% and interpersonal violence at 12.3%. In their research, Rahman A et al⁽¹⁴⁾ also found that RTA accounted for 75% of all etiologies of zygomaticomaxillary complex fractures. Others included accidental falls (9%), sports injuries (4%), and interpersonal assaults (12%). The growing frequency of zygomaticomaxillary complex fractures in Pakistan is caused by the drivers who are young and are ignorant of traffic laws, breaking them and driving carelessly. Since the majority of individuals in Pakistan come from low-income families, they often utilize public transit to go about and are thus more likely to fall victim to this particular trauma.

CONCLUSION

Our research leads us to the conclusion that traffic accidents are the most frequent etiological cause for zygomaticomaxillary complex fractures. The most vulnerable age group in this regard was found to be ranging between the ages of 20 and 30 years. It is further imperative that roadway regulations be strictly

enforced and that the general public be made aware of them aptly.

Author's Contribution:

Concept & Design of Study: Zaineb Abbas
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 Revisiting Critically: Zaineb Abbas,
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 Final Approval of version: By all above authors

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