

FREQUENCY AND PATTERN OF INFRAORBITAL NERVE DYSFUNCTION IN PATIENTS WITH ZYGOMATICOMAXILLARY COMPLEX(ZMC) FRACTURES

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ABSTRACT

Objectives: To compute the frequency and pattern of infraorbital nerve deterioration (Anesthesia, Paresthesia, Dysesthesia and Hypoesthesia) presenting with zygomaticomaxillary complex fractures presented to Hayatabad Medical Complex.

Methods and materials: The study was conducted in the Department of Oral and Maxillofacial Surgery, MTI-HMC, Peshawar, and lasted six months, from June 4, 2018 to December 4, 2019. A thorough medical history, clinical examination, and neurosensory tests such as static two-point distinction, brush stroke directional test, contact detection, pin prick nociception, and thermal discrimination tests were all performed, along with the necessary radiographs such as occipitomental view, submentovertex view, and computed tomography scans.

Results: Out of total 126 patients, 42(33.33%) patients were recorded with infraorbital nerve dysfunction in 3 age groups, 30 patients were in 15-30 year age group, 60 patients were in age group 31-45 year age and 36 patients were in 46-65 year of age, out of which 7 patients were from female gender.

Conclusion: Every patient with a ZMC fracture should be clinically assessed on the dot for infraorbital nerve dysfunction, which can cause unpleasant feelings on the face, upper lip, lateral skin of the nose, anterior gingiva, and lower eyelid.

Key words: ZMC fractures, ION Paresthesia, Road Traffic Accidents.

INTRODUCTION

The zygomatic arch is a paired bone that assists in cheek prominence contouring, acts as a pillar to the floor and lateral walls of the orbit, as well as the walls of the temporal and infratemporal fossae, and is a part of the zygomatic arch. Each zygomatic bone is divided into four quadrants. Each zygomatic bone is connected to the frontal bone by the frontozygomatic

suture, and is connected with maxilla by means of zygomaticomaxillary suture, the zygomaticosphenoid suture connect it with sphenoid bone and to temporal bone with the help of zygomaticotemporal suture.¹

The zygomaticomaxillary complex (zmc) fracture is the second most common lateral midface fracture after nasal skeleton fracture.² The most prevalent causes of these fractures include road traffic accidents, fights, falls, sports injuries, and civilian conflict.³ ZMC fractures are characterised by peri-orbital ecchymosis, infraorbital nerve paresthesia, flattening of the face, subconjunctival ecchymosis, epistaxis, pain, step deformity of the orbital boundaries, trismus, and diplopia. Sensory disturbance in

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the form of paresthesia, which is nerve dysfunction of the infraorbital nerve, is an essential symptom of ZMC fracture, especially if the fracture is displaced, which was shown to be 20% in one research.⁴

The infraorbital canal and infraorbital fissure housing nerve are commonly implicated in zygomaticomaxillary complex fractures because anatomical boundaries embrace them in 95 percent of known instances. After ZMC fractures, infraorbital nerve injury is prevalent, with rates ranging from 18 to 83 percent. Damage might occur as a direct result of the trauma or as a result of the nearby nerve being crushed. Damage to the infraorbital nerve can result in sensory abnormalities such as hypoesthesia, dysesthesia, paresthesia, or anaesthesia in the parts of the face it physically supplies, such as the lower eyelid, cheek, upper lip, skin of the nose, and intraorally, a portion of the gingiva and teeth on the affected side.^{5,6} When the functional recovery of the nerve is taken into account, 77.3 percent of patients reported complete functional recovery after open reduction and internal fixation.⁷

Open reduction and internal fixing are two of the most often recommended ways of fixation with excellent results. According to De Man and Bax from the Netherlands, reduction and fixation were effective in the healing of sensory abnormalities of the infraorbital nerve. According to Vriens and Moos, open reduction and internal fixing had better results than infraorbital nerve redemption.^{8,9} Sakavicius and colleagues observed that 77.3 percent of patients' function is completely recovered after open reduction and internal fixation; these findings are congruent with the current study's findings.⁷ Following zygomatic fractures, Benoliel detailed how neurosensory anomalies in the infraorbital nerve were treated using a number of approaches, and they came to the conclusion that plate fixation allows for much enhanced infraorbital nerve function recovery.⁵ It's unusual to get chronic neuropathic pain as a result of zygomatic fractures. Kumar et al. discovered that the earlier the surgery, the better the nerve damage healing throughout the 1 to 6 month follow-up period.¹⁰

MATERIALS AND METHODS

The cross sectional study was done utilising connective sampling in the Department of Oral and

Maxillofacial Surgery, Hayatabad Medical Complex, Peshawar, from June 4th to December 4th, 2018, after receiving approval from the same hospital's Research and Ethics Committee. After receiving written informed permission, all patients who met the study's inclusion criteria were enrolled. The study's objective was conveyed to the patients, who were assured that the trial was being undertaken only for research and data collection. Data was collected using a Performa. Using the WHO sample size calculator, the total sample size was 126 individuals with a 7% margin of error and a 95% confidence range based on the prior frequency of Infra orbital nerve dysfunction (20%). A thorough history, clinical examination, and neurosensory tests such as the brush stroke directional test, static two-point discrimination, contact detection, pin prick nociception, and thermal distinction tests were performed, as well as necessary radiographs such as the occipitomental view, submentovertex view, and computed tomography scan. A Performa was used to collect data. Based on the past prevalence of Infra orbital nerve impairment, the total sample size was 126 persons with a 7% margin of error and a 95% confidence range using the WHO sample size calculator (20 percent). The brush stroke directional test, static two-point discrimination, contact detection, pin prick nociception, and thermal distinction tests, as well as essential radiographs such the occipitomental view, submentovertex view, and computed tomography scan, were all done.

RESULTS

Out of 126 patients,42(33.33%) patients were having infraorbital nerve dysfunction, the per age

Table No.1: Age, Gender distribution

ZMC fractures	Frequency	Percentages
Infraorbital nerves dysfunction	42	33.33%
Gender		
Male	108	85.71%
Female	18	14.28%
Age		
15-30 years	30	23.80%
31-45 years	60	47.41%
46-65 years	36	28.57%
Mean age and SDs	36±12.16	

Table No. 2:

Zygomatico maxillary Complex		Gender		P Value
		Male	Female	
Infraorbital nerve dysfunction	Present	35(27.77%)	07(5.55%)	0.589
	Absent	73(57.93%)	11(8.73%)	

Zygomatico maxillary Complex		Age Group			P Value
		15-30	31-45	46-60	
Infraorbital nerve dysfunction	Present	10(7.93%)	17(13.49%)	15(11.90%)	0.589
	Absent	15(15.87%)	43(34.12%)	21(16.66%)	

distribution was 30(23.80%) patients were recorded in 15-30 year age group, 60 patients(47.41percent) were in age group of 31-45 year age group and 36(28.57%) were in 46-65 year age group. Mean and standard deviation for age was 36+12.16. (Table-No. 1).

As per gender and age group distribution, 108(85.71%) patients were recorded as male and whereas 18(14.28%) were recorded as female patients. As per Zygomatico maxillary Complex fractures, 42(33.33%) were having infraorbital nerve dysfunction, among them 35 patients were male and 7 patients were from female gender(Table-No. 2).

DISCUSSION

The Zygomatic complex provides the cheeks their shape and is the second most often broken bone after the nasal bone in the mid face, accounting for 13% of all craniofacial fractures.⁴

The aetiology of maxillofacial fractures differs by location, and certain variations are attributed to civic, racial, and environmental variables. In the West, interpersonal violence is the most prevalent etiology,¹¹ In poor nations, RTA is commonplace.¹² The adoption of mandatory seat belt regulations, as well as the overuse of alcohol and illegal substances in such countries, may be to blame for the changing trend in the aetiology of fractures in the west.^{11,13}

The mid facial bones are made up of a complex of brittle bones connected by sutures that give way to a smaller extent than other parts of the body in the event of stress. The key to treating facial trauma situations is to treat them as quickly as feasible, with a focus on function and aesthetics.¹⁴

According to Jamal et al gender distribution of patients with zygomaticomaxillary complex fractures were 88% male with a mean age of 36 years and ac-

ording to our study 86 % of patients were male and out of 126 patients 69 % were patients were from the age group of 30 to 65 years.¹⁵ The reason behind the high incidence of ZMC fracture among males in our community may that they are more social and males drives mostly. When compared to a closed reduction procedure, a number of writers have seen a significant improvement in sensory function after open reduction and internal fixation using plates.^{16,17,18,19} Because sensory function usually returns following a nondisplaced zygoma fracture, infraorbital nerve dysfunction is not the primary rationale for opening and decompression.¹⁵ In underdeveloped nations, requiring the usage of seatbelts has resulted in a significant reduction in face injuries. Seat belts and helmets are required in our neighbouring nation, India, under the Motor Vehicle Act (MVA), but compliance is poor. The importance of teaching individuals how to utilise headgear and seatbelts when travelling will help to reduce face bone injuries.²⁰

CONCLUSION

About one third of patients with Zygomatic bone fractures are associated with infraorbital nerve dysfunction, examination and managment of infraorbital nerve should be integral consideration while managing zygomaticomaxillary complex fractures.

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