

## Original Article

### A Clinical Assessment of Zygomatico- complex facial fracture occurring at K. R. Hospital – Mysore- A 2 Year Retrospective Study

S. Sandeep Tejaswi<sup>1</sup>, T.S. Subash<sup>2</sup>

<sup>1</sup>M.D.S. Oral and Maxillofacial Surgery Resident-Department of Dentistry, K.R. Hospital, Mysore -01;

<sup>2</sup>M.D.S, Conservative and Endodontics, MSc, Forensic Odontology, Head of The Department, Department of Dentistry, K.R. Hospital, Mysore -01.

#### ABSTRACT:

**Introduction:** Facial trauma is the most common trauma all over the world and more than 30% trauma cases suffer from fractured Maxillofacial skeleton. Moreover the neurological component associated with it makes it even more complex to manage<sup>2</sup>, Zygoma occupies a prominent position on the face and so zygomatic complex fractures are second most common fracture after nasal bone fractures. **Aim:** The aim of the study was to investigate Epidemiological data age, gender, fracture site, type, etiology, mode of injury, characteristics of zygomatico complex facial fractures and treatment given. **Materials and Methods:** A retrospective clinical study was conducted on patients reporting to Department of Dentistry K.R. Hospital data was retrieved from MLC Record Books between January 2015- January 2017. The data collected was analyzed for age, gender, etiology, fracture site, mode of injury characteristics of fracture and treatment provided. . A total of 300 patients presented with Zygomatico orbital complex and zygomatic arch fractures. Patients with isolated orbital fractures were excluded. The patients ranged in the age from 0 to 60 years. Epidemiological data including age, gender, etiology, site and mode of injury and details of treatment were collected and tabulated. **Results:** A total of 300 patients(222 males and 78 females, male to female ratio 3:1) were evaluated and treated for zygomatico-complex fractures at Department of Dentistry .K.R. Hospital Mysore -01 between January 2015-January 2017. Their ages ranged from 0 to 60 years evaluated based of Knight and North 1961 classification. Type II fractures was most common type of ZMC fracture accounted for 30% of all cases. Assaults 70%, RTA 50%, Sports 20%, alcohol intake -60% were noted. More than half of patients experience injury due to assault , alcohol intake was maximum, RTA and sports injury, the data was analyzed for soft tissue injuries also occurring concomitantly along with ZMC fractures. **Conclusion:** As per the above study Males have higher incidences of ZMC fractures due to assault and work related injuries and alcoholism during evening and night times in Mysore and most common fractures are Type II fractures best managed by Gillie's temporal approach, however individual techniques has to be tailored for ZMC fractures for each patient. Among the factors tabulated maximum amount of ZMC fractures are seen in male population due to assault in mid adult age groups 31-40 years of age and Type II ZMC accounted maximum which abrasions as soft tissue injury in dusk hours and least being sports related injury.

**Key words:-**Zygomatico maxillary complex, facial trauma, tetrapod, Gillie's temporal, Subciliary.

Received: 8 February, 2019

Revised: 27 March, 2019

Accepted: 28 March, 2019

**Corresponding Author:** Dr. T.S. Subash, M.D.S, Conservative and Endodontics, MSc, Forensic Odontology, Head of The Department, Department of Dentistry, K.R. Hospital, Mysore -01, Karnataka, India

**This article may be cited as:** Tejaswi SS, Subash TS. A Clinical Assessment of Zygomatico- complex facial fracture occurring at K. R. Hospital – Mysore- A 2 Year Retrospective Study. J Adv Med Dent Scie Res 2019;7(4): 66-69.

#### INTRODUCTION:-

Facial trauma is the most common trauma all over the world and more than 30% trauma cases suffer from fractured Maxillofacial skeleton.<sup>1</sup> Moreover the neurological component associated with it makes it even more complex to manage.<sup>1,2</sup> Maxillofacial fractures are often associated with severe morbidity, functional deficits, disfigurement and significant financial cost.<sup>3,4</sup>

Zygoma occupies a prominent position on the face and so zygomatic complex fractures are second most common fracture after nasal bone fractures<sup>5</sup>. Fractures and dislocation of this bone causes disruption in articulation of zygomatico complex and orbito zygomatico complex. It is very important to reduce and fix these fractures accurately. To analyze these types of injuries and its correlation to factors such as time, mode of injury, gender

distribution are paramount factors for clinician to give overall perspective and association of such factors to predict the outcomes of the situations.

**MATERIALS AND METHODS:-**

A Retrospective clinical study was conducted on patients reporting to Department of Dentistry K.R. Hospital data was retrieved from MLC Record Books between January 2015- January 2017. The study approval has been obtained from Head of the Department. The data collected was analyzed for age, gender, etiology, fracture site, mode of injury characteristics of fracture and treatment provided.

Most of the cases recorded with flattening of Malar eminence, circum orbital ecchymosis, subconjunctival hemorrhage, partial trismus and paresthesia of infraorbital nerve. Diagnosis were confirmed by taking Routine Radiographs, PNS view, Submentovertex View, OPG, Computer tomography- C.T. scans which were available from the records.

A total of 1000 charts of patients presenting Maxillofacial trauma at Department of Dentistry at K.R. Hospital Mysore was evaluated. A total of 300 patients presented with Zygomatico orbital complex and zygomatic arch fractures. Patients with isolated orbital fractures were excluded. The patients ranged in the age from 0 to 60 years. Epidemiological data including age, gender, etiology, site and mode of injury and details of treatment were collected and tabulated.

All Maxillofacial injures were assessed and treated by Resident Maxillofacial surgeon . Other concomitant injuries were treated by consulting specialist.

**MATERIALS AND METHODS:**

Zygomatico complex fractures were evaluated as per **Knight and North 1961** Classification system <sup>17</sup>:-

**DATA:-**

Statistical method used - Descriptive Frequency, Chi square test, Cramer’s test.

**Table 1: TOTAL STUDY SUBJECTS**

SEX	FREQUENCY	PERCENTAGE	TEST USED	VALUE
MALES	222	74%	Chi square test	69.120
FEMALES	78	26%	df	1
TOTAL	300		SIGNIFICANCE	0

**Table 2: MODE OF INJURY AND ITS DISTRIBUTIONS**

TYPE	FREQUENCY	PERCENTAGE	TEST USED	VALUES
RTA	150	50%	Chi square test	118.667
ASSAULT	70	70%	df	3
ALCOHOLISM	60	60%	SIGNIFICANCE	0
SPORTS	20	20%		
TOTAL	300			

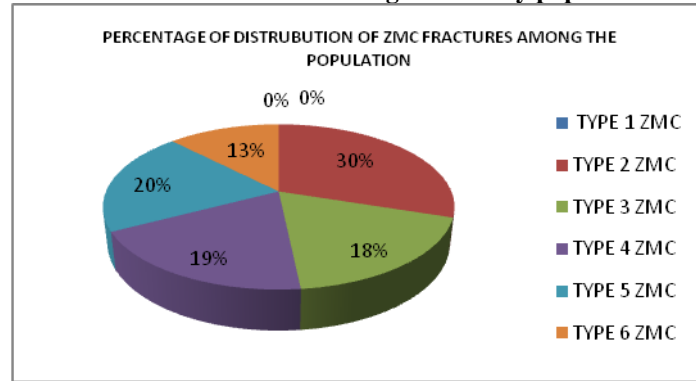
**Table 3: TIME OF INJURY**

TIME	FREQUENCY	PERCENTAGE	TEST USED	VALUES
MORNING	40	13.3	Chi square test	110.773
AFTERNOON	20	6.7	d f	3
EVENING	122	40.7	significance	0
NIGHT	118	39.3		
TOTAL	300			

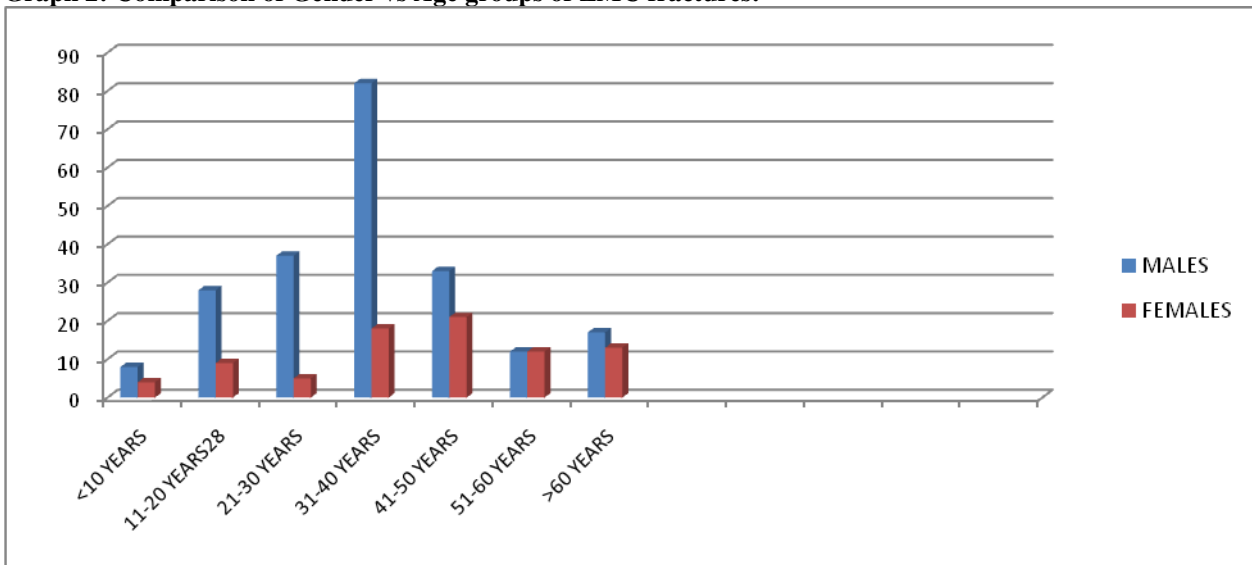
**Table 4: SOFT TISSUE INJURIES:-**

TYPES	FREQUENCY	PERCENTAGE	TEST USED	VALUE
LACERATION	172	57.3%	Chi square test	204.37
ABRASIONS	48	16%	df	3
DEGLOVING	3	1%	significance	0
CONTUSIONS	77	25.7%		

**Graph 1: Percentage distributions of ZMC fractures amongst the study populations:-**



**Graph 2: Comparison of Gender vs Age groups of ZMC fractures:-**



**RESULTS:-**

A total of 300 patients [Table 1] (222 males and 78 females, male to female ratio 3:1) were evaluated and treated for zygomatico- complex fractures at Department of Dentistry K.R. Hospital Mysore between January 2015-January 2017. Their ages ranged from 0 to 60 years(Graph no 2) evaluated based of Knight and North 1961 classification. Type II fractures was most common type of ZMC fracture accounted for 30% of all cases(Graph no 1). Assaults 70%, RTA 50%, Sports 20%, alcohol intake -60% were noted(Table no 2). More than half of patients experience injury due to assault , alcohol intake was significant history, RTA and sports injury in our study. The data was analyzed for soft tissue injuries also occurring concomitantly along with ZMC fractures. Lacerations 57.3%, Abrasions 16%, Degloving Injuries 1%, Contusions 25.7%. [Table 4] The CT study was done to evaluate ZMC fracture among Males and Females-accounting Unilateral ZMC fracture in Males (50.45%),Females (35.89%), Bilateral ZMC Males (14.4%),Females (29.48%), Isolated ZMC fractures Males(30.1%), Females (35.89%) which is well correlated with other studies<sup>7</sup>.

. Work related injury leading to abrasions over periorbital and malar regions -16% of abrasion and contusions were -25.7%, least are De gloving injuries 1%

of total soft tissue injuries. Time of occurrence of ZMC fractures: 40.7% of cases occurred in the evening hours due to RTA, 13.3% of the cases occurred in the morning hours due to sports related injury, and 6.7% of the cases occurred in the afternoon hours due to assault which coincides with similar studies.<sup>4</sup> [Table 3]

**DISCUSSION:-**

A large number of studies have reported on the aetiology of facial trauma.<sup>1,8</sup> The results of epidemiological investigations vary depending on the demographics of the population studied. Factors such as geographic region, socioeconomic status and temporal factors, including time of year and time of the study, can influence both the type and the frequency of injuries reported for a given population.<sup>5</sup>This makes meaningful comparisons between epidemiological reviews difficult.

Among the factors tabulated maximum amount of ZMC fractures are seen in male population due to alcohol intake in mid adult age groups 31-40 years of age and Type II ZMC accounted maximum lacerations as soft tissue injury in dusk hours which could be well coincided with events, probably it is due to alcohol intake and fall during dusk hours it can be attributed that the nature of injury is severe than compared to morning and afternoon

hours and least being sports related injury<sup>4,8</sup>. ZMC fractures which are analyzed are associated with alcohol intake showed higher trauma rates and more severe the injury. The results of this study suggest that violence prevention programs concentrating on both assault and self-inflicted injury may help decrease the frequency of facial trauma resulting from intentional injuries in this population. In addition, drinking and driving campaigns require strengthening because 60% of the all injuries were alcohol-related in our study. Optimal management of ZMC fractures begins with accurate and expedient diagnosis followed by formulation of treatment plan that accounts for proper reduction of fractured segments to restore facial balance. Finally surgical expertise is needed to allow for appropriate execution of treatment plan as well as to manage the cases.

#### CONCLUSION:-

Zygomatic bone occupies predominant role in facial skeleton whose deformity causes much of cosmetic significance for patient. A thorough knowledge and analysis of individual cases for proper management is of paramount importance in each case. As per the above study Males have higher incidences of ZMC fractures due to assault and work related alcoholism during evening and night times in Mysore, lacerations constitute majority of soft tissue injury, Unilateral ZMC fractures amongst males were highest in our study, majority of fractures occurred in dusk hours due to RTA as recorded this study probable due to poor visibility of road conditions and and most common fractures are Type II fractures best managed by Gillie's temporal approach, however individual techniques has to be tailored for ZMC fractures for each patient. Facial trauma can result in fractures limited to 1 component of tetrapod fractures but more commonly results in tetra pod fractures involving all 4 buttress. Each patient of ZMC patient has to be evaluated individually and data recorded for further modifications.

#### REFERENCES:-

1. Hollier LH, Thomton J, Pazmino P, Stal S. The management of orbitozygomatic fractures. *Plast Reconstr Surg* 2003;111: 2386-92.
2. Bogusaik K, Arkuszewski P. Characteristics and epidemiology of zygomatico maxillary complex fractures. *J Craniofac Surg* 2010; 21:1018-23.

3. Banks P, Brown A 1<sup>st</sup> ed. Oxford; Wright; 2001. Fractures of Facial Skeleton pp 40-155.
4. Tanaka N, Tomutsuka K, Shionoya K, Andou H, Kimijima Y, Tashiro T et al. Aetiology of maxillofacial fracture. *Br J Oral Maxillofac Surg* 1994; 32:19-23.
5. Ravindran V, Ravichandran Nair K.S. – Metanalysis of Maxillofacial Trauma in Northern districts of Kerala- one year prospective study. *J Maxillo Surg* 2011;10:321-327
6. Keiser J, Stephenson S, Listen P N, Tong D C, Langley J D, Serious facial fractures in New Zealand from 1979 -1998. *Int J Oral Maxillofac Surg* 2002;31:206-209
7. Analysis of Zygomatic arch fracture – Hwang, Kim D H . *J Craniofac Surg* 2011; Jul 22(4), 1416-21.
8. Raymond J Fonseca Editor – Oral and Maxillofacial trauma Vol 1 st edition. W.B. Saunders 1991; 571.
9. Prigozen JM, Horswell BB, Flaberty SK, Henderson JM, Graham DA, Armistead LM et al. All –terrain vehicle – related maxillofacial trauma in pediatric population. *J Oral Maxillofac Surg* 2006; 64:1333-7.
10. Gassner R, Tuli T, Hachl O, Moreira R, Ulmer H. Craniomaxillofacial trauma in children; a review of 3385 cases with 6060 injuries in 10 years. *J Oral Maxillofac Surg* 2004; 64:399-407.
11. Kushner GM. Surgical approaches to the infraorbital rim and orbital floor: the case for the transconjunctival approach. *J Oral Maxillofac Surg*, 2006; 64:108-110.
12. Ellis E, Kittidumkerng W. Analysis of treatment for isolated zygomaticomaxillary complex fractures. *J Oral Maxillofac Surg*, 1996; 54:386-400, discussion 400-401.
13. Hoelzle F, Klein M, Schwerdtner O, et al. Intraoperative computed tomography with the mobile CT Tomoscan M during surgical treatment of orbital fractures. *Int J Oral Maxillofac Surg*, 2001; 30:26-31.
14. Wong MEK, Johnson JV. Management of mid face injuries. In: Fonseca R, Marciani R, Hendler B (Eds). *Oral and maxillofacial surgery*. Vol 3. Philadelphia: WB Saunders, 2000; pp 245-299.
15. Prein J. Manual of internal fixation in the craniofacial skeleton. New York: Springer-Verlag, 1998; pp 133-148. 6. Chotkowski G, Eggleston TI, Buchbinder D. Lagscrew fixation of a nonstable zygomatic complex fracture: A case report. *J Oral Maxillofac Surg*, 1997; 55:183-185.
16. Gruss JS, Van Wyck L, Phillips JH, et al. The importance of the zygomatic arch in complex midfacial fracture repair and correction of post-traumatic orbitozygomatic fracture deformities. *Plast Reconstr Surg*, 1990; 85:878-89.
17. Knight JS, North JF. The classification of malar fractures: An analysis of displacement as a guide to treatment. *Br J Plast Surg* 1961; 13:325-9.
18. Tadj A, Kimble FW. Fractured zygomas. *ANZ J Surg* 2003;73:49-54.