

ETIOLOGY OF MANDIBULAR CONDYLAR FRACTURES; A STUDY FROM TERTIARY CARE HOSPITAL OF LAHORE

¹MUHAMMAD ARSHAD BADAR, BDS, FCPS

²SYED ADNAN ALI SHAH, BDS, MDS, FDSRCS

³ARSALAN WAHID, BDS, MPhil

ABSTRACT

It is a cross sectional study conducted in a tertiary care hospital. Patients of condylar fracture reporting to oral & maxillofacial trauma center were evaluated radiographically (OPG, PA view and Lateral Oblique View) as well as clinically to record the etiology of mandibular condylar fractures.

A total of 70 patients of 3 to 45 years of age were included in this study. The frequency of condylar fractures was higher in male of all age groups except for 11-20 years where females comprised of 55.5% of the cases. Among males, the highest frequency of fractures occurred in the third decade of life. Regarding the etiology of mandible condylar fractures, falls (45.71%) and RTA (40%) were found to be the most predominant causative factors, followed by industrial and occupational accidents (6%), Sports injuries (6%) and assault injuries (3%). Falls were the etiologic factor in most of the cases which explains the association of falls with the mechanism of condylar injury. Road traffic accidents were the second common cause. Type 2 fractures which are low neck fractures with displacement were seen to be the most frequent.

Keys Words: *Condylar Fracture, Etiology, Trauma, Radiography,*

INTRODUCTION

Mandibular fractures are the most common fractures of facial skeleton.¹ They may present alone or combined with some other facial injuries. Parasymphysis region is frequently involved in mandibular fractures followed by condylar and subcondylar areas.² According to some previous studies, the incidence of mandibular fractures is higher in males.³ Fracture of condylar process is common fracture of the mandible⁴ with a frequency of 25% to 50%.⁵ Gutta R et al 2014,⁶ reported that angle of the mandible is the most common site of mandibular fractures. In some studies^{5,7} researchers observed violence and alleged assault as

most common causes. In his study, Joshi SR et al 2013⁸ reported that traffic accidents were the most common cause of fractures, while Scariot R et al 2009,⁹ observed that falls were the most common causes.

The neck portion of the condyle is the weakest region of the entire mandible and is the most susceptible to fracture.¹⁰ This site is usually overlooked during diagnosis of fractures in the head and neck region.¹¹ Key clinical features and detailed radiological investigations are mandatory for diagnosis of condylar injuries.¹²

Some authors reported that in age group of 6-12 years, bicycle accidents are usually the most common cause of mandibular fractures.¹³ So the leading causes of condylar fractures are Road traffic accidents, interpersonal violence, sport injuries, accidental falls and industrial trauma.

METHODOLOGY

It's a cross sectional analytical study on the etiology of mandibular condylar fractures. It was conducted in the department of Oral and Maxillofacial Surgery, de, Montmorency College of Dentistry/Punjab Dental Hospital Lahore. It is a tertiary care referral centre for

¹ Associate Professor and Head (Oral & Maxillofacial Surgery) University Medical & Dental College Faisalabad House Number 123, Near Iftikhar General Store. Iqbal Town, Chak 204 R.B East Canal Road. Faisalabad, Pakistan Email: arshad_badar@hotmail.com Phone: +923334080297

² Professor & Head (Oral & Maxillofacial Surgery) University of Manitoba, Canada Email: adnan.shah.92@facebook.com

³ Senior Registrar & Head (Oral & Maxillofacial Pathology) University Medical & Dental College, Faisalabad, Pakistan Email: dr.arsalanmalik@gmail.com

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maxillofacial injuries not only for Lahore but whole of the Punjab.

All consecutive patients irrespective of age and gender reporting with mandibular condylar fractures to the hospital for treatment were requested for participation in the study. The eligibility criteria for enrollment of patients were: One, patients of either gender; two, able to understand the local language (Urdu and Punjabi); three, able to give informed consent for enrollment in the study. This study was undertaken on 70 patients with mandibular condylar fractures, irrespective of age and gender.

A thorough history of the patients was noted down and detailed clinical examination was performed on all the patients reporting with trauma to their mandibular condyles. All subjects with suspicion of having mandibular condylar fractures were prescribed standard orthopantomogram (OPG), a postero anterior view and lateral oblique view of mandible. Final diagnosis of mandibular condylar fractures was established with the aid of clinical and radiographic findings. The etiology of mandibular condylar fractures was compiled according to etiology, site and relative frequency.

Demographic variables like age, gender, education, employment status and marital status were calculated in frequencies. Study variable like RTA, falls, sports, assault and Industrial causes were evaluated in frequencies. Level of significance was set at $p < 0.05$ with a confidence level of 95%. Data were entered and analyzed in SPSS software, (version 20.0; SPSS Inc., Chicago, IL, USA).

RESULTS

A total of 70 patients were included in this study sample aged 3 to 45 years. Most of the patients were males (80%), with females constituting only one fifth of the cases (Table 2).

The frequency of condylar fractures was higher in male of all age groups except for 11-20 years where females formed 55.5% of the cases. Among males, the highest frequency of fractures occurred in the third decade of life. (50% of total male patients). (Table 2)

The etiology of mandible condylar fractures was found to be multifactorial, however, falls (45.71%) and RTA (40%) were found to be the most predominant causative factors. These were followed by industrial and occupational accidents (6%), Sports injuries (6%)

TABLE 1: FRACTURE TYPES (SPIESSL/SCHROLL CLASSIFICATION)

Type I	Fracture without displacement
Type II	Low fracture with displacement
Type III	High fracture with displacement
Type IV	Low fracture with dislocation
Type V	High fracture with dislocation
Type VI	Intracapsular fracture

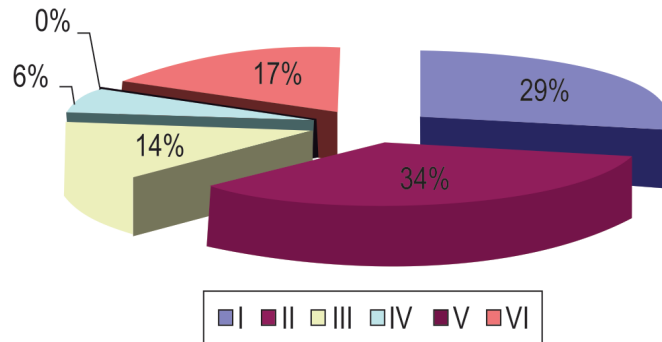


FIG 1: Distribution Of Fracture Types

TABLE 2: GENDER DISTRIBUTION

Sex	No.	Percentage (%)
Male	56	80
Female	14	20
Total	70	100

TABLE 3: FREQUENCY DISTRIBUTION OF AGE AMONG MALE AND FEMALE

Age	Males	Females	Total	%age
1-10 years	12	4	16	22.5
11-20 years	8	10	18	25.5
21-30 years	28	0	28	40
31-40 years	4	0	4	6
> 40 years	4	0	4	6

TABLE 4: FREQUENCY DISTRIBUTION OF ETIOLOGY AMONG MALE AND FEMALE

Etiology	Males	Females	Total
RTA	22	6	28
Falls	24	8	32
Sports	4	0	4
Assault	2	0	2
Industrial	4	0	4

and assault injuries (3%). Falls were seen to be the most prevalent cause in either of the gender groups. (42.86% of males and 57.14% of females). (Table 3)

According to Spiessl/Schroll classification,¹⁴ Type 2 fractures were of highest proportion (34.29%) followed by Type 1 fractures (28.57%), Type 6 (17.14%), Type 3 (14.28%) and Type 4 (5.71%). (Table 4)

DISCUSSION

The etiology of condylar fractures has always generated interest and one of the reasons attributable to it can be the range of differences in causative factors in different age and gender groups. In this study, females constitute only one fifth (20%) of the total cases. On the contrary, in a study by Larsen and Nielsen¹⁵ the male female ratio was 3:1 and in the Bastian's¹⁶ investigation which was performed after one decade, the ratio was changed to 2.3:1. Marker et al¹⁷ carried their study 11 years later than this study and reported the ratio as 2:1. This change in the male female ratio in this Scandinavian country data, according to Marker represents the corresponding changes in the country. On the other hand, the relative frequency of condylar fractures in female population of the country remains low. This can be attributed to the more home bound nature of the female population in Pakistan which makes them less prone to be associated with road traffic accidents especially motor bike injuries. Similarly, the likelihood of females to be associated in violent altercations save domestic accidents and industrial and workplace injuries and outdoor sports' inflicted injuries remain low. It can be possible that there was an under reporting of condylar fractures occurring in females resulting from violent assault in a rural setup that could have been managed conservatively at a local level.

According to a researcher, the frequency of condylar fractures was highest (26.15%) in age group of 11-20 years in both males and females. In this age group, he cited road traffic accidents to be the biggest causative factor.¹⁸ This was followed by the age group of 21-30 years which contributed 20.98% of all condylar fractures. In the current study, however, it was found that 21-30 year of age group carried the highest number of condylar fractures, which was true for males and females of all age groups except for 11-20 years where females formed 55.5% of the cases. In this study, among males, the highest frequency of fractures occurred in the third decade, in the age group of 21-30 years (50% of total male patients), whereas again the 11-20 year age group according to Marker et al¹⁷ constituted 16.08%

of all condylar fracture cases in males. The findings of Lida and Matsuya¹⁹ also demonstrated condylar fractures being common in children younger than 14 years, especially in those below 6 years. But according to Newman²⁰ most of the 61 patients he reviewed for condylar fractures were between 17 and 32 years old, which closely match the present study.

It may be due to the fact that condylar fractures in younger population (1-20 years) occur as isolated fractures and remain unreported due to absence of any other diagnosable injury of mandible. The lack of diagnostic facilities and awareness in the less privileged and rural areas is also a big drawback in this regard. At present, we do not have a government or other agency's data to support this hypothesis about the isolated condylar fractures being unreported in a younger age group. This is indirectly supported by the high number of temporomandibular joint ankylosis reported in literature with a few years past history of trauma sustained by the children while under 10 years of age and in their teens.

The results of the current study show that road traffic accidents is the second most numerous cause. Abbas et al² described road traffic accidents as the main cause of mandibular fractures. Assaults and domestic violence share in the etiology of condylar fractures is probably under reported because of two factors. One, the domestic violence among husband and wife results in condylar fractures and remains unreported due to the social limitations. Two, the long and tenuous process of medico-legal processes in registering assault victims sometimes lead the patients not to seek treatment for condylar fractures that do not cause other noticeable symptoms like malocclusion or inability to open the mouth.

In the present study the classification system of condylar fractures used was same as described by Spiessl and Schroll¹⁴. Joos and Kleinheinz²¹ examined 122 cases of condylar fractures and showed type 2 fractures to comprise the highest number of the total cases. These were followed by type 1, type 4, type 6, type 3 and type 5 fractures. Similar to their findings, Type 2 fractures that are low fractures with displacement constitute the highest number of condylar fractures in the current study, which were followed by type 1 fractures. Type 2 and Type 6 fractures may be under reported because of respective reasons.

According to Strobl et al²², type 3 fractures were the most numerous (41.81%) in the 55 paediatric condylar

fractures in their study. Their findings show a difference from the present study due to the major reason that this study was carried out in children less than 10 years of age and the bone character and morphology at this age may be such that it predisposes the higher part of the condylar neck to an increasing number of injuries.

CONCLUSION

The information presented by this study can be useful in describing the pattern and variety of condylar fractures in Pakistani society. In studies conducted in other parts of the globe, condylar fractures seem to occur more frequently in males than females although the male: female ratio is more accentuated in this study (5:1). The highest number of cases was seen in the third decade of life (21-30 years). Other studies are divided on this variable between first, second and third decades of life. Falls were the etiologic factor in most of the cases in the present study which explains the association of falls with the mechanism of condylar injury through a whiplash to the chin. Road traffic accidents are the second most numerous causes. According to Spiessl and Schroll classification, Type 2 fractures which are low neck fractures with displacement were seen to be the most frequent and were followed by Type I fractures, Type 6, Type 3 and Type 4.

One of the most frequent and avoidable cause of condylar fractures i.e. road traffic accidents induced injuries can be prevented by enforcing a strict regulation on the use of seat belts in cars and helmets for motorcyclists. Any injury to the face and especially the mandibular region should be evaluated clinically and radiographically for an insult to the condylar region by an oral and maxillofacial surgeon.

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