Original Article

Prevalence and Pattern of Mandibular Fractures in Islamabad, Pakistan; A Retrospective Study

Muhammad Hashim Asad, Kalsoom Khan, Hina Rahman Sario, Salman Younas, Naveed Ahmed and Syeda Sameena Tasneem

ABSTRACT

Objective: To evaluate prevalence and pattern of mandibular fracture presented in various centers of oral and maxillofacial surgery of Islamabad region.

Study Design: Retrospective study

Place and Duration of Study: This study was conducted at the School of dentistry, Pakistan Institute of Medical Sciences Islamabad, KRL Hospital, Islamic international medical and dental college, Islamabad Medical and dental college Islamabad from July 2021 till March 2022.

Materials and Methods: Patient's having maxillofacial trauma was accessed from the record of different Oral and Maxillofacial Surgery hospital of Islamabad. During which 900 patients record was access among them 254 patients record was included due to having only isolated mandibular fracture. Data was entered and analyzed using SPSS v 23.0. Frequencies and percentages were calculated for fracture type, site, etiology and gender. Mean was described for age.

Results: The study revealed that among 254 patients, males in the age group of 21-30 years were in majority. Parasymphysis 43%, angle 30%, subcondylar 27 % and body of mandible fracture was 24%. Most common cause of trauma was the Road traffic accidents (79.9%).

Conclusion: From the present study we conclude that males belonging to the age group of 21-30 years are most frequently prone to mandibular fractures with highest mandibular parasymphysis fracture.

Key Words: Prevalence, Patterns, etiology, Facial trauma, Mandibular fractures.

Citation of article: Asad MH, Khan K, Sario HR, Younas S, Ahmed N, Tasneem SS. Prevalence and Pattern of Mandibular Fractures in Islamabad, Pakistan; A Retrospective Study. Med Forum 2022;33(12):40-43.

INTRODUCTION

World Health Organization reported that, around 1 million people losses life due to trauma and every year around 15 to 20 million population reported with injures in road traffic accidents(RTAs)[1]. Mandible fractures are the most common fractures of the facial skeleton due to its prominent position and mobility [2, 3]. Fractures of the mandible account for 36%-59% of all facial bone fractures.[2, 4] In spite of the mandible being the toughest and largest bone of the face, it is the 10th most commonly injured bone in the body[4],[2],[5].

The male/female proportion recorded for developed countries is around 3:1, while the male prevalence is more striking in developing countries [6]. However, in the latest reports the pattern is toward the equal gender proportion[7].

PIMS/SZABMU Islamabad.

Correspondence: Hina Rahman Sario, clinical attaché at PIMS/SZABMU, Islamabad.
Contact No: 03189005433
Email: hinarahmansariobadc@gmail.com

Received: August, 2022
Accepted: October, 2022
Printed: December, 2022

These fractures could be classified according to severity as simple and compound, regarding the direction of fracture as favorable and non-favorable, with respect to type of fracture as greenstick, impacted, comminuted, and complex, regarding the teeth involvement in the fracture site as dentulous, partially edentulous, edentulous, and classification regarding the site of fracture as condylar, coronoid, ramus, angle, body, symphysis, parasymphysis of mandible[8].

The facial trauma specially mandibular which are categorically classified as: traumatic, iatrogenic and pathological fractures, among them traumatic etiology is the most cause[9]. The basic cause for facial trauma might be shifted from road traffic accidents to physical violence and from fall to sports trauma, in which alcohol consumption is the major contributing factor[10]. In spite of road traffic accidents (RTAs) and physical assault, such trauma can be occur due firearm incidents[2],industrial accidents and even attack by animals[5]. Road traffic accidents reported to be the main etiology for mandibular fractures in developing countries, which shows 60-80% of the cases with increase in mortality rates. Interpersonal violence account for about 10-20% cases followed by falls (5%) and other causes including sports injuries and industrial trauma[3]. In comparison, interpersonal violence and

sports are the main etiological factors for of mandibular trauma in developed countries[3]. In rare cases, mandibular fractures also occur secondary to certain diseases such as sarcomas, cystic lesions and metabolic diseases which are classified as pathological fractures[11].

Among the facial bones the mandible is the only mobile bone while the remaining facial skeleton is fixed [12]. Patients presenting with mandibular fractures may experience pain, edema, trismus, deranged occlusion, hematoma formation, lower lip paresthesia, ecchymosis and loose teeth [13]. Injuries related to mandibular bone can range from minimal head and facial lacerations to sever closed brain trauma [14]. Patients with fractures of lower jaw experience pain, trouble biting and talking, decrease mouth opening, unable to yawn properly and sleeping difficulty. A recent study on mandibular fracture patterns conducted in Peshawar, Khyber Pakhtunkhwa reported with common mandibular bone fracture as result of road traffic accidents among young male population[15].

Despite many published reports regarding mandibular fractures, there is a limited literature on the prevalence and importance of mandibular fractures in this region. With current evidence suggesting geographical variations in mandibular fracture patterns, there is a need to evaluate these patterns in Pakistan. This would provide evidence for maxillofacial surgeons to have an understanding of mandibular trauma in the population of this region. Hence, the primary objective of this retrospective study was to evaluate the prevalence and different patterns of mandibular trauma in Islamabad with respect to aid surgeons in anticipating the most probable site of fracture on presentation so as to help with treatment planning.

MATERIALS AND METHODS

A retrospective study was conducted from July 2021 till March 2022. Ethical approval was taken from competent authority of Ethical Review Committee of School of Dentistry Shaheed Zulfiqar Ali Bhutto Medical University Islamabad vide reference No.SOD/ERB/2021/116. Patient's having mandibular fracture was accessed from the record of different Oral and Maxillofacial Surgery centers of Islamabad. During which 900 patients record was access among them 254 patients record was included due to having only isolated mandibular fracture. The gender, age, etiology, type of facial trauma (single or multiple), site of mandibular fracture were retrieved from the patient records. The data was entered and analyzed through SPSS v 23.0. Frequencies and percentages were described for gender, etiology, fracture site and type. Mean and standard deviation were calculated for age.

RESULTS

This study included a total of 254 patient's record. All patients had fractured mandible. There were 230 (90.6%) males and 24 (9.4%) females. The mean age of the participants was 27.45 + 12.7 years. The most of these victims were up to 30 years of age (n = 161, 63.2%). Only 69 patients were above 30 year.

The most common etiology of mandibular fracture reported as a result of road traffic accidents (n = 203, 79.9%), followed by fall (n = 23, 9.1%) and assault (n = 12, 4.7%), as shown in table I.

Table No.1. Etiology of Mandibular Fractures

Etiology	Male	Female	No. of patients (%)
RTA	189(74.3%)	14(5.5%)	203(79.9%)
Fall	17(6.6%)	7(2.3%)	23(9%)
Assault	10(3.9%)	2(0.7%)	12(4.7%)
FAI	8(3.1%)	1(0.4%)	9(3.5%)
Occupational injury	7(2.7%)	0	7(2.7%)

The parasymphysis was the commonest fracture site (n = 110, 43%)., followed by the angle of the mandible (n = 77, 30%). Most of the parasymphysis fractures were only unilateral (n = 105, 41.3%).

Table No.2. Frequency of Mandibular Fracture Sites

Fracture site	Frequency of fracture (%)		
	Unilateral	Bilateral	Total
Condyle	10 (3.9%)	4 (1.6%)	14 (5.5%)
Sub condyle	49 (19.3%)	20(7.9%)	69 (27%)
Coronoid	4 (1.6%)	0	4 (1.5%)
Ramus	9 (3.5%)	0	9 (3.5%)
Angle	73 (28.7%)	4 (1.6%)	77 (30%)
Body	55 (21.7%)	6 (2.4%)	61 (24%)
Parasymphysis	105(41.3%)	5 (2%)	110 (43%)
Symphysis	40 (15%)		40 (15%)

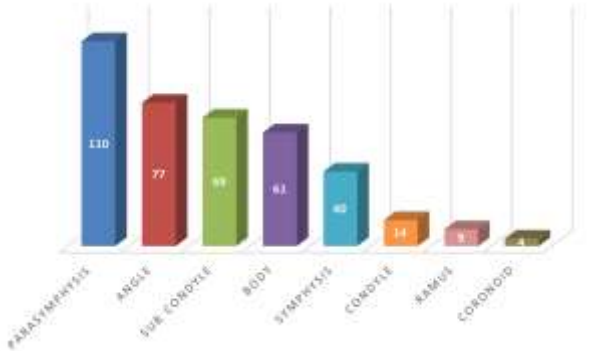

Figure No.1: Anatomical Distribution of Mandibular Fractures

DISCUSSION

In the maxillofacial region the mandibular bone is hardest and second most common site for fractures after the nasal bone owing to its relative protuberance in comparison to rest of the facial skeleton.[16,17] Mandibular trauma ranges from 15.5 to 59% of all the maxillofacial bone fractures [16]. Majority of mandibular fracture victims were males in this study with ratio of 3:1 male to female. This is in line with previous studies carried out in Pakistan and India, where the male to female ratio for mandibular fractures has been reported

to be 3.6:1.[4, 18] The mean age was 27.45 + 12.7 in our study with the peak age of fractures to be 18 years. These findings are consistent to previous studies which report mandibular fractures to be more common in males with age ranging from 15-25 years[4, 19].

We found RTA to be the leading cause for mandibular fractures from 79.7% (n=203) of the total fractures studied, followed by fall (9%), assaults (4.7%), FAI (3.5%) and occupational injury (2.7%). RTA accounting for majority of the mandibular fractures and our subjects mostly being young male patients could be associated with rash and careless driving of cars and motorbikes by these people. Moreover, since more RTA with fractures involve motorbikes, this also explains the large number of males in our sample, since motorbikes are primarily driven by males in Pakistan[20]. A study by Rashid et al reported that the leading cause of mandibular fractures is RTA in Pakistan which might be underage driving, over speeding, overloading of vehicles, poor condition of infra-structure and lack of traffic law implementation[4]. Impatience driving, driving after alcohol abuse, lacks of helmet use, and poor road conditions have been reported as some of the factors attributing to RTA in other parts of the world [16,21]. Previous epidemiological studies have reported RTAs and falls as the most common cause of mandibular trauma in developing countries [22]. However, physical violence has been reported as main cause of mandibular fractures in developing
countries [23].

The common anatomical fractures site either bilaterally or unilaterally was parasymphysis (43%), followed by angle (30%) and the subcondylar region (27%). Other fracture sites; condyle, ramus, body, coronoid and symphysis together accounted for (48.5%) of the fractures. Parasymphysis being the most common site of mandibular fracture has been reported in many studies [16,24] which is followed by symphysis and condylar fractures [25]. However a study by Iqbal et al stated that the combination fractures are the most common type of fracture followed by parasymphysis and condyle fracture [26]. We also observed that that RTA caused proportionally more concurrent mandibular fractures. Literature reports that the etiology and anatomic sites of mandibular fracture may be correlated and is evidenced by the fact that majority of parasymphysis fractures occur as a result of an RTA [4]. In this study fracture site varied with age and gender. The parasymphysis fracture with a small proportion occurring elsewhere in the mandible was reported in younger populations while in the older population of this study reported parasymphysis followed by angle and subcondyle fracture.

Our study had several limitations, as in this study data was collected retrospectively in which most of the patients data was incomplete. Furthermore, our study had a relatively smaller sample size with limited duration. Moreover, data for this study was only collected from the hospitals of Islamabad. Future studies should use a prospective, cohort study design with a larger duration and include multiple cities.

Keeping the findings of the study in mind, awareness programs should be executed to develop driving sense among the population and strict regulation of traffic guidelines must be implemented.

CONCLUSION

In this study we conclude that males belonging to the age group of 21-30 years are most frequently prone to mandibular fractures. The most common site of fracture is the parasymphysis followed by angle of mandible and most common cause being road traffic accidents (RTA) followed by history of fall and interpersonal violence.

Acknowledgement: We are thankful to Dr. Zahoor Ahmed Rana for their comments and guidance throughout the study.

Author's Contribution:

Concept & Design of Study:	Muhammad Hashim Asad
Drafting:	Kalsoom Khan, Hina Rahman Sario
Data Analysis:	Salman Younas, Naveed Ahmed, Syeda Sameena Tasneem
Revisiting Critically:	Muhammad Hashim Asad, Kalsoom Khan
Final Approval of version:	Muhammad Hashim Asad

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Arun A, Narayanan V, Saravanan C, R K. Prevalence and the Pattern of Mandibular Fractures in Northeast Chennai. Int J Contemporary Med Research 2020;7(august 2020):4.
2. Chaurasia A, Katheriya G. Prevalence of mandibular fracture in patients visiting a tertiary dental care hospital in North India. National J Maxillofacial Surg 2018;9(2):123-8.
3. Shaikh Q, Shahzad M, Khan UQ, Zahoor S, Sarfaraz B. Epidemiological Pattern of Mandibular Fracture in A Tertiary Care Hospital. Annals of PIMS ISSN 1815:2287.
4. Rashid S, Kundi JA, Sarfaraz A, Qureshi AU, Khan A. Patterns of Mandibular Fractures and Associated Comorbidities in Peshawar, Khyber Pakhtunkhwa. Cureus 2019;11(9):e5753-e.
5. Saravanan T, Balaguhan B, Venkatesh A, Geethapriya N, Goldpearlinmary, Karthick A.

Prevalence of mandibular fractures. Indian journal of dental research : official publication of Indian Society for Dental Research 2020;31(6):971-4.
6. Rashid A, Eyeson J, Haider D, van Gijn D, Fan K. Incidence and patterns of mandibular fractures during a 5-year period in a London teaching hospital. Br J Oral Maxillofacial Surg 2013;51(8): 794-8.
7. Ghodke MH, Bhoyar SC, Shah SV. Prevalence of mandibular fractures reported at C.S.M.S.S Dental College, aurangabad from february 2008 to september 2009. J Int Soc Prev Community Dent 2013;3(2):51-8.
8. Abbas I, Ali K, Mirza YB. Spectrum of mandibular fractures at a tertiary care dental hospital in Lahore. J Ayub Med Coll, Abbottabad : JAMC 2003;15(2):12-4.
9. Țenţ PA, Popa D, Juncar R-I, Lung T, Juncar M. Evaluation of the Epidemiology and Traumatic Etiology of Mandibular Fractures a 10-year Retrospective Statistical Study. Am Scientific Res J Engineering, Technol Sciences (ASRJETS). 2016;26(4):252-60.
10. Shah N, Patel S, Sood R, Mansuri Y, Gamit M, Rupawala T. Analysis of Mandibular Fractures: A 7-year Retrospective Study. Ann Maxillofac Surg 2019;9(2):349-54.
11. Natu SS, Pradhan H, Gupta H, Alam S, Gupta S, Pradhan R, et al. An epidemiological study on pattern and incidence of mandibular fractures. Plastic Surgery Int 2012;2012:834364.
12. de Matos FP, Arnez MF, Sverzut CE, Trivellato AE. A retrospective study of mandibular fracture in a 40-month period. Int J Oral Maxillofacial Surg 2010;39(1):10-5.
13. Singh S, Fry RR, Joshi A, Sharma G, Singh S. Fractures of angle of mandible - A retrospective study. J Oral Biol Craniofac Res 2012;2(3):154-8.
14. Sirimaharaj W, Pyungtanasup K. The epidemiology of mandibular fractures treated at Chiang Mai University Hospital: a review of 198 cases. J Med Assoc Thailand = Chotmaihet Thangphaet 2008;91(6):868-74.
15. Vyas A, Mazumdar U, Khan F, Mehra M, Parihar L, Purohit C. A study of mandibular fractures over a 5-year period of time: A retrospective study. Contemporary Clinical Dentistry 2014;5(4):452-5.
16. Kumar DR, Kulkarni DP, Purohit DJ, Abraham DAA, Rehman DSQM. Patterns & Amp; Incidence of mandibular fractures: an epidemiological study. Eur J Molecular Clin Med 2021;7(11):7144-9.
17. Al-Moraissi EA, Ellis III E. Surgical treatment of adult mandibular condylar fractures provides better outcomes than closed treatment: a systematic review and meta-analysis. J Oral Maxillofacial Surg 2015;73(3):482-93.
18. Subhashraj K, Ramkumar S, Ravindran C. Pattern of mandibular fractures in Chennai, India. Br J Oral Maxillofacial Surg 2008;46(2):126-7.
19. Almasri M, Amin D, AboOla AF, Shargawi J. Maxillofacial fractures in Makka city in Saudi Arabia; an 8-year review of practice. Am J Public Health Res 2015;3(2):56-9.
20. Khan I, Khan A, Aziz F, Islam M, Shafqat S. Factors associated with helmet use among motorcycle users in Karachi, Pakistan. Academic Emergency Med 2008;15(4):384-7.
21. Al Ahmed HE, Jaber MA, Fanas SHA, Karas M. The pattern of maxillofacial fractures in Sharjah, United Arab Emirates: a review of 230 cases. Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontol 2004;98(2):166-70.
22. Sakr K, Farag IA, Zeitoun IM. Review of 509 mandibular fractures treated at the University Hospital, Alexandria, Egypt. Br J Oral Maxillofacial Surg 2006;44(2):107-11.
23. Zix J, Schaller B, Lieger O, Saulacic N, Thoren HA, Iizuka T. Incidence, aetiology and pattern of mandibular fractures in central Switzerland. Swiss Medical Weekly 2011;141(w13207):w13207.
24. Barde D, Mudhol A, Madan R. Prevalence and pattern of mandibular fracture in Central India. National J Maxillofacial Surg 2014;5(2):153.
25. Ali Z, Punjabi SK, Shafique S, Jan S. Retrospective analysis mandibular fractures at Abbasi Shaheed Hospital, Karachi. Pakistan Oral Dent J 2015;35(1).
26. Iqbal S, Aslam A, Ahmed S, Khan N, Kashif M, Kazmi SM. Spectrum of mandibular fractures in a tertiary care hospital of Karachi. Int J Frontier Sciences 2020;4(2).