DOI: https://doi.org/10.53350/pjmhs22161309

ORIGINAL ARTICLE

Evaluation of Efficacy of Post-Operative Antibiotic Prophylaxis in Mandibular Fractures

ATIQ UR RAHMAN[1], MARIA NOOR[2], YASER ISHAQ[3], TOOBA SAEED[4], SAADIA MANZAR[5], ALI FAROOQ[6]
[1]*BDS, FCPS Assistant Professor, Department of Maxillofacial Surgery Mufti Mehmood Teaching Hospital Dera Ismail Khan*
[2]*BDS, FCPS Assistant Professor, Department of Oral Medicine FMH College of Medicine & Dentistry Lahore*
[3]*BDS, FCPS Assistant Professor, Department of Oral & Maxillofacial Surgery Akhtar Saeed Medical & Dental College Lahore*
[4]*BDS, FCPS Assistant Professor, Department of Oral & Maxillofacial Surgery University College of Medicine and Dentistry, The University of Lahore*
[5]*BDS, FCPS Assistant Professor Oral & Maxillofacial Surgery Rashid Latif Dental College, Rashid Latif Medical Complex, Lahore*
[6]*BDS, FCPS, MSc Assistant Professor, Oral & Maxillofacial Surgery Department Sharif Medical & Dental College, Lahore*
Correspondence to: Dr. Yaser Ishaq, Email: dryaserishaq@yahoo.com, Cell: +92 321 2111161

ABSTRACT

Study Objectives: To evaluate the efficacy of post-operative antibiotic prophylaxis in mandibular fractures.
Study Design and Settings: It was a randomized controlled trial carried at of Department of Oral & Maxillofacial Surgery Akhtar Saeed Medical & Dental College Lahore from January 2021 to June 2021.
Patients and Methods: After accepting to be enrolled in the study 50 patients with mandible fractures were randomly assigned into two groups Group A and Group B respectively. From admission until 24 hours post-operatively, all patients were given prophylactic antibiotic. The patients were than evaluated for evidence of infection at 6 weeks post-operatively..
Results of the Study: The age incidence varied from 18-60 years. The maximum number of patients belongs to age group 20-30 years. In a total of 50 patients, 45 male and 5 female patients were enrolled for the study. 4 of 25 patients in group A (16%) and 3 of 25 patients in group B (12%) reported with infection during follow-up. No statistically significant difference in the incidence of infection was noted between the groups
Conclusion: In this study it was concluded that 1 day post-operative antibiotic is adequate to prevent post-operative infection in uncomplicated mandible fractures. The extended use of post-operative prophylactic antibiotic does not affect the incidence of infection in uncomplicated mandible fracture.
Keywords: Mandibular Fractures, Post-Operative Antibiotic, Efficacy

INTRODUCTION

The most frequently reported injuries in developed as well as developing countries are Maxillofacial fractures.[1]Among the etiological factors, the most common being assaults and interpersonal violence in developed countries followed by falls, road traffic accidents and sports injuries contrast to this, in developing countries the most common cause of fractures is road traffic accidents.[2] This could be due to various factors including use of motorbikes in developing world, seat belt and speeding legislations, overloading of a vehicle, use of a safety helmet, fatigue and alcoholism.[3] Most of the people involved in maxillofacial injuries are in the third and fourth decade of their lives.[4]Mandible is most commonly fractured among all facial bones.[5] The pattern of mandibular bone fracture has changed drastically over the past two decades due to increase occurrence of high velocity impact. While simple and unilateral fractures were more common before, with high velocity trauma, there is increase in multiple fractures of a single bone along with comminution of a fractured bone in various segments. In this article, the reported causes and pattern of mandibular fractures have been determined .6 To the best of researcher knowledge very rare literature in local population is available about this topic. So this study was undertaken to check efficacy of post-operative antibiotic prophylaxis in mandibular fractures.

PATIENTS AND METHODS

It was a randomized controlled trial conducted at the Department of Oral & Maxillofacial Surgery Akhtar Saeed Medical & Dental College Lahore from January 2021 to June 2021. This study involved 50 patients, both healthy males and females between the ages 18-60 years, patients with uncomplicated mandible fractures and patients not on any antibiotic therapy. Patients having comminuted fracture, presence of infection at the fracture site on initial presentation, pathological fracture (cysts or tumors), history of radiation or malignancy to neck or head area, oversensitivity to antibiotics like beta- lactams and patients with isolated fractures of ramus or condyle were excluded from the study.

The patients were prepared for internal fixation and open reduction, having simple mandible fractures according to standard procedure and then shifted to the major or minor operation theater based on the type of anesthesia given (general anesthesia/local anesthesia). Pressure dressing was placed over the surgical site using elastic adhesive bandage. All patients were prescribed betadine mouthwash, post-operatively. Patients were randomly divided into 2 groups A and group B respectively. From the entry time of patients till 24 hours post-operatively, all patients were provided with prophylactic antibiotic. From admission of patients up to 24 h postoperatively, prophylactic antibiotic were given to all patients. Injection Amoxicillin+Clavulanic Acid- 1.2g/I.V/bid Injection Metronidazole 100ml/Iv/tid.
Patients in 5-day Group A: Tab Amoxicillin+Clavulanic Acid: 625mg Tab Metronidazole: 400 mg was given.
Patients in 1 day Group B: Tab Amoxicillin+Clavulanic Acid: 625mg Tab Metronidazole: 400 mg was given. All patients were followed up from the time of their admission till 6th postoperative week.

RESULTS

Table 1: Distribution of site of fracture

Parameter	Total	Group A	Group B
Site of Fracture			
Symphysis	4	2	2
Parasymphyis	19	8	11
Body	8	5	3
Angle	5	1	4
Combination	14	9	5
Type of reduction(open/closed)			
Open reduction	47	24	23
Closed reduction	3	1	2
Type of Anesthesia			
General anesthesia	35	19	16
Local anesthesia	15	6	9

Table 2: Infection rate post-operatively

	Number ofpatients	Number of infected wounds	Percentage %	t-value	p-value
Group A	25	4	16	0.123	p>0.05
Group B	25	3	12		
Total	50	7	14		

The age incidence varied from 18-60 years. Most of the patients are 20-30 years old. Out of 50 patients, 5 female patients

and 45 male patients were registered for the study. In an overall, 7 patients (14%) were discovered to be infected. At follow-up of 6 weeks, 4 patients were infected in Group A and 3 were infected in Group B.

DISCUSSION

Selection of antibiotic drug depends on standards comprising its spectrum of action, its accessibility in the wellbeing facility and the distinction of being a medication with few documented side effects.

There are no clear guidelines about how long will be the postoperative regimen. Some other researches documented the treatment time period that ranges from only a dose to a course of 7 days and even 10 days postoperatively. Antibiotics can be related with or toxic or allergic reactions, drug interactions, other adverse effects and it aids in the rise of bacterial resistance. Furthermore, some researchers believe that using an antibiotic for a long period of time increases the chance of problems from super-infection.[11] In the literature, studies are there to substantiate the role of pre-operative and intra- operative antibiotics but very few studies, compare the duration of post-operative antibiotics in mandible fractures. In our prospective randomized study we found an infection rate of 16% (4/25) in the 5 day group (Group A) and 12% (3/25) in the 1 day group (Group B). The data observed in our study is coherent with the infection rates found in various studies mentioned below. Abubaker et al. found an infection rate of 14.3% in the 5 day post-operative oral antibiotic group and 12.5% in the placebo group.[12] Miles et al. found that infection rates in the group that received antibiotics in the post-operative period for less than or greater than 48 hours did not differ significantly.[13] Christine Lovato, also reported that by comparing two groups, the infection rate was not statistically different.[14]

On analysis of various studies Andreasen et al. discovered a fourfold increase in the infection rate of fractures being diagnosed by internal fixation and open reduction.[15] In our study also all the 7 infected cases were treated by open reduction, which comprised of 57% (4/7cases) in Group A and 43% (3/7 cases) in Group B. Thus, the both groups have similar infection rate, which is in accordance to the study done by Lovato[14] and Schaller et al.[11,] and Chole RA[16].

CONCLUSION

In this study it was concluded that 1 day post-operative antibiotic is adequate to prevent post-operative infection in simple mandible fractures. The extended usage of post-operative prophylactic antibiotic has no effect on the infection rate in simple mandible fracture.

REFERENCES

1. Shah I, GadkareeS, Tollefson T, Shaye D. Update on the management of craniomaxillofacial trauma in low-resource settings. Current Opinion in Otolaryngology & Head and Neck Surgery. 2019;27(4):274-279.
2. Lalloo R, Lucchesi L, Bisignano C, Castle C, Dingels Z, Fox J et al. Epidemiology of facial fractures: incidence, prevalence and years lived with disability estimates from the Global Burden of Disease 2017 study. Injury Prevention. 2020;:injuryprev-2019-043297.
3. Choi S, Gu J, Kang D. Analysis of Traffic Accident-Related Facial Trauma. Journal of Craniofacial Surgery. 2016;27(7):1682-1685.
4. Pita Neto I, Franco J, Junior J, Santana M, de Abreu L, Bezerra Í et al. Factors Associated With the Complexity of Facial Trauma. Journal of Craniofacial Surgery. 2018;29(6):e562-e566.
5. Samieirad S, Tohidi E, Shahidi-Payam A, Hashemipour M, Abedini A. Retrospective study maxillofacial fractures epidemiology and treatment plans in Southeast of Iran. Medicina Oral Patología Oral y Cirugia Bucal. 2015;:e729-e736.
6. Wahid FI, Habib-ur-Rehman, Saleem M, Ahmad I. Pattern of Maxillofacial Trauma seen at ENT Department of a Tertiary Care Hospital. Pak J Med Sci 2011;27(5):1042-1045.
7. Ain Q, Wahid A, Javed T. Assessment of mandibular fracture healing with resorbable plates and screws; an interventional study in a tertiary care hospital. Journal of University Medical & Dental College. 2015 Dec 3;6(4):46-53.
8. Arvind RJ, Narendar R, Kumar PD, Venkataraman S, Gokulanathan S. Maxillofacial trauma in Tamil Nadu children and adolescents: A retrospective study. Journal of pharmacy & bioallied sciences. 2013 Jun;5(Suppl 1):S33.
9. Schaefer IV EH, Caterson EJ. Antibiotic selection for open reduction internal fixation of mandible fractures. Journal of Craniofacial Surgery. 2013 Jan 1;24(1):85-8.
10. Domingo F, Dale E, Gao C, Groves C, Stanley D, Maxwell RA, Waldrop JL. A single-center retrospective review of postoperative infectious complications in the surgical management of mandibular fractures: postoperative antibiotics add no benefit. Journal of Trauma and Acute Care Surgery. 2016 Dec 1;81(6):1109-14.
11. Schaller B, Soong PL, Zix J, Iizuka T, Lieger O. The role of postoperative prophylactic antibiotics in the treatment of facial fractures: a randomized, double-blind, placebo-controlled pilot clinical study. Part 2: mandibular fractures in 59 patients. British Journal of Oral and Maxillofacial Surgery. 2013 Dec 1;51(8):803-7.
12. Omar Abubakar And Michael K. Rollert. Postoperative Antibiotic Prophylaxis In Mandibular Fractures: A Preliminary Randomized, Double-Blind, And Placebo-Controlled Clinical Study. J Oral Maxillofac Surg 2001; 59:1415-1419.
13. Miles BA, Potter JK, Ellis III E. The efficacy of postoperative antibiotic regimens in the open treatment of mandibular fractures: a prospective randomized trial. Journal of oral and maxillofacial surgery. 2006 Apr 1;64(4):576-82.
14. Lovato C, Wagner JD. Infection rates following perioperative prophylactic antibiotics versus postoperative extended regimen prophylactic antibiotics in surgical management of mandibular fractures. Journal of oral and maxillofacial surgery. 2009 Apr;67(4):827-32.
15. Jens O. Andreasen, Simon S. Jensen, Ole Schwartz, Yören Hillerup. A Systematic Review of Prophylactic Antibiotics in the Surgical Treatment of Maxillofacial Fractures. J Oral Maxillofac Surg 200;664:1664-1668
16. Chole RA, Yee J. Antibiotic prophylaxis for facial fractures: a prospective, randomized clinical trial. Archives of Otolaryngology–Head & Neck Surgery. 1987 Oct 1;113(10):1055-7.