

Dentists Knowledge Regarding Antibiotic Prescription, and Dosage of the Prescribed Antibiotics

ANAM MAHMOOD¹, HIBA TABASSUM², SARFARAZ HUSSAIN³, MUZAFFAR QAYUM KHAN GHOURI⁴, FIDA BALOCH⁵, JAWAID SULTAN⁶

¹FCPS Orthodontics DIKHIOS, DUHS, Karachi

²MDS Orthodontics DIKHIOS, DUHS, Karachi

³FCPS Orthodontics DIKHIOS, DUHS, Karachi

⁴Assistant Professor, Orthodontics, Bhattai Dental and Medical College Mirpur Khas

⁵Associate Professor, oral and Maxillofacial surgery, Bhattai Dental and Medical College Mirpur Khas

⁶Assistant Professor, Prosthodontic Department, Bhattai Dental and Medical College Mirpur Khas

Corresponding author: Anam Mahmood, Email: anumahmood@gmail.com

ABSTRACT

Objective: To determine the prescription pattern for antibiotics, which antibiotics were prescribed most frequently, and the dosage of antibiotics prescribed.

Methodology: This cross-sectional investigation was performed from May 2014 to July 2014. A total of 100 practicing dentists were selected at random. This study consisted of two portions. In part 1 (prescriptions), dentists were asked to fill out a questionnaire regarding the antibiotics they prescribed over a period of 4 weeks. In part 2 (self-reported practice), dentists were asked to complete a questionnaire regarding their general information, their specialty, and their knowledge about the prescription of antibiotics. Dentists were also asked to mention if their prescription was therapeutic or prophylactic, cases in which antibiotics were prescribed, and also mention the treatment plan. All data was collected and registered on a predesigned Proforma.

Results: A total of 100 dentists were interviewed regarding antibiotic prescriptions. Out of all, 37 were females and 63 were males, and their mean age was 33.02 years. The most commonly recommended antibiotic was amoxicillin (49%), followed by amoxicillin + Clavulanic acid (33%). The commonest reason for the prescription of antibiotics was periapical infection (43%), followed by, periodontitis (14%), simple extraction (10%), and (pulpitis 9%) and remaining reasons. Out of the all, most of the individuals (82%) had prescribed due to therapeutic reasons and 18 due to prophylactic reasons.

Conclusion: It is concluded that the several of the dentists were prescribing antibiotics for several oral conditions where local administration would be adequate and antibiotics were unnecessary.

Keywords: Prescription, Antibiotics, Resistance.

INTRODUCTION

Dental experts frequently prescribe antibiotics to patients in their practice for both dental therapy and infection prevention. An important contributor to the development of antibiotic resistance is the improper usage of antibiotics.¹ In addition to dealing with epidemics, there have been antibiotic resistance epidemics. There are dentists who prescribe antibiotics, but there is little evidence available on their knowledge, comprehension, and appropriate use of these medications in clinical settings.^{2,3} Dentists recommend from 7% to 11% of each general antibiotic (metronidazole, clindamycin, tetracyclines, macrolides, betalactams).⁴ In the UK, dental doctors represented 7% of overall population recommendations for antimicrobials.⁵ In contrast, the CDC estimates that roughly 33.33% of all antibiotic prescriptions for outpatients are unneeded.⁶ Antibiotic prescription can possibly be correlated with adverse side effects varying from GI-disturbances to lethal anaphylactic shock, as well as resistance development. The current escalation of antibiotic resistance is most likely linked to the overuse or misuse of broad-spectrum antibiotics such as fluoroquinolones and cephalosporins.⁷ We are living in an age where a few bacterial species have developed resistance to the complete variety of antibiotics accessible at present, with the *Staphylococcus aureus* resistant to methicillin being the most extensively recognized model of wide-ranging resistance. Dental doctors depend on antibiotics for the administration of a broad range of odontogenic as well as non-odontogenic situations, where the intention of these recommendations can be therapeutic or protective.⁸ About 6% to 10% of overall antibiotic references have been reported to be recommended by dentists.⁹ Previous research looked at the use of antibiotic prescriptions in severe dental alveolar infections as well as prophylaxis in cases of endocarditis.^{8,9} More recent research has revealed that general practitioners of dentistry make incorrect prophylactic and therapeutic recommendations, as well as that several non-clinical factors can influence prescribing.^{8,10} These critical complications correlated with antibiotics utilization have supported studies examining the antibiotic prescriptions of dentists.^{11,12} An adequate

fact exists that exhibits a significant correlation between the rise in antimicrobial -utilization and resistance, with elevated bacterial resistance levels isolated from regions with elevated antibiotic use compared with those from regions with low antibiotic use.¹³ Insufficient statistics are accessible on the comprehension and perception of general practitioners of dentistry regarding the application of antibiotics in daily clinical practice. Our study's goal was to assess the dentist's knowledge of antibiotic prescription, including the types and dosage of antibiotics prescribed.

MATERIAL AND METHODS

This cross-sectional investigation was performed from May 2014 to July 2014. The study sample was drawn from dentists registered by the PMDC (Pakistan medical and dental council) who were practicing in Hyderabad in 2014. Out of all the practicing dentists, 100 were selected at random to participate in our survey. This study consisted of two portions. In part 1 (prescriptions), dentists were asked to fill out a questionnaire regarding the antibiotics they prescribed over a period of 4 weeks. In part 2 (self-reported practice), dentists were asked to complete a questionnaire regarding their general information, their specialty, and their knowledge about the prescription of antibiotics. Dentists were asked to fill out a form for every patient for whom they had prescribed an antibiotic. The form included the patient's general information, medical history (allergies, etc.), the type, dose, and duration of antibiotics, and the contemporaneous prescription of analgesics and antimicrobials. Dentists were also asked to mention if their prescription was therapeutic or prophylactic. In the cases in which antibiotics were prescribed, the dentists were asked to also mention the treatment plan. All data was collected and registered on a predesigned Proforma.

RESULTS

A total of 100 dentists were interviewed regarding antibiotic prescriptions. Out of all, 37 were females and 63 were males, and their mean age was 33.02 years. The most commonly

recommended antibiotic was amoxicillin (49%), followed by amoxicillin + Clavulanic acid (33%). Table .1

The most frequent duration of prescription of antibiotic was 5 days (93%). TABLE:2

Analgesics were the most commonly prescribed drug along with antibiotics (82%), followed by antimicrobials (1%), and the remaining 17 were not given any other drug, as shown in fig. 1.

The commonest reason for the prescription of antibiotics was periapical infection (43%), followed by periodontitis (14%), simple extraction (10%), and (pulpitis 9%) and the remaining reasons are shown in fig:2

Out of the total, most of the individuals (82%) had been prescribed medicine for therapeutic reasons, and 18 for prophylactic reasons FIG:3.

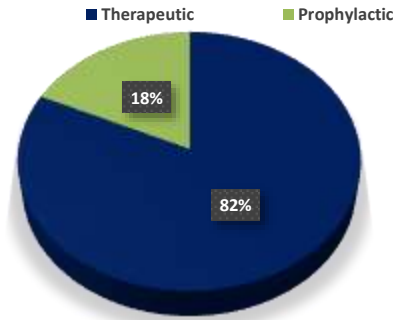


Fig.3: Prophylactic or therapeutic prescriptions n=100.

Table 1: Frequency of different antibiotics and duration of prescription of antibiotics n=100

Antibiotics	Frequency	%
Amoxicillin	49	49%
Amoxicillin +Clavulanic acid	33	33%
Clindamycin	2	2%
Lincomycin	2	2%
Cephalosporin	3	3%
Syr. Amoxicillin	4	4%
Syr. Augmentin	2	2%
Levofloxacin	3	3%
Ampicillin	1	1%
Days		
3 days	4	4%
5 days	93	93%
7 days	3	3%

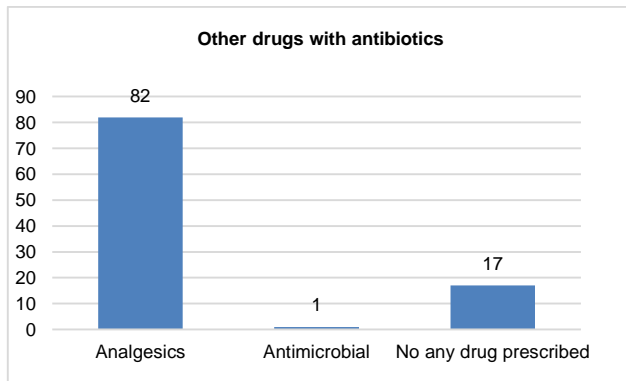


Fig. 1: Drugs prescribed along with antibiotics n=100

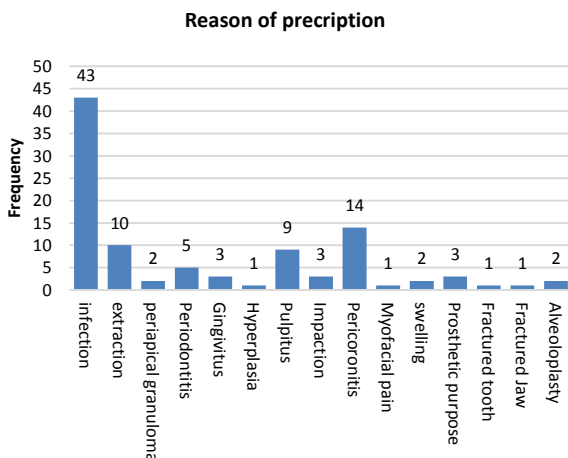


Fig. 2: Reasons of prescriptions of antibiotics n=100.

DISCUSSION

Public health is currently seriously threatened by resistance of the antibiotics. The world is currently on the verge of a post-antibiotic age, where ordinary diseases and mild injuries that have been curable for years may once again kill, unless quick, concerted action by many stakeholders is taken. In this series, 467 individuals were studied, out of whom 100 (21.4%) were prescribing an antibiotic. Furthermore, out of these 100 practitioners, 63 were female and 37 were male, with an overall mean age of 33.02 years. Tanwir F et al² also reported similar findings. Inconsistently, Nabavizadeh MR et al¹⁴ reported that males were 57% and the females were 43%. This study highlights the misuse and inappropriate prescription of antibiotics, which has led to resistance to the drug. Resistance of antibiotics is a challenge that affects human health all over the world, this issue is mainly caused due to either over prescription or antibiotics prescribed in cases where they are not needed. Similarly, a Pakistani study by Tanwir F et al² mentioned that, whenever assessed using written simulated case situations, 61% of respondents showed below-average understanding. In this study, the commonest recommended antibiotic was amoxicillin (49%), followed by Amoxicillin + Clavulanic acid (33%). Similarly, Saadat S et al¹⁵ reported that the antibiotic of choice was Amoxicillin among 43.3%, Amoxicillin Clavulanate among 34%, as well as Metronidazole among 11.3% of reviewed dentists for the therapy of severe dental diseases. In other studies, Baumgartner JC¹⁶ and Salinas MB et al¹⁷ also mentioned that amoxicillin clavulanate or amoxicillin are proposed for the therapy of dental disease.

We found the most common reason for the prescription of antibiotics to be periapical infection (43%), followed by simple extraction (10%). As well as Saadat S et al¹⁵ demonstrated that most respondents recommend antibiotics in cases of pericoronitis (75.20%), cellulitis (85.39%), severe necrotizing ulcerative gingivitis (70.70%), chronic periodontitis (41.50%), periodontal abscess (65.10%), acute pulpitis (53.90%), 17.90% dry socket and the chronic marginal gingivitis (24.70%). Another study reported that, for patients with irreversible pulpitis, 40.0% of responders suggested antibiotics without a requirement, whereas 52.9% of practitioners advised taking antibiotics in the situation of a necrotic pulp with acute apical periodontitis without swelling, and approximately 21.5% recommended antibiotics in cases of necrotic pulps having chronic apical periodontitis as well as a sinus tract. Abbot et al¹⁸. And Abbot PV¹⁹ described an inclination towards over-prescription and exhibited inadequate awareness of the prevalence of adverse effects.

In this study, 82% of therapeutic prescriptions and 18% of prophylactic prescriptions were made, in a study conducted in Manchester, similar results were seen, 153/192 cases (80%) were recommended antibiotics as a therapy for oral and dental diseases, and 39/192 (20%) for prophylaxis.²⁰ Even though "irrational prescription" is not a new worldwide issue and has long been cause for concern, numerous nations are still not giving this long-standing but persistent global issue adequate attention.

Recently published principles give suggestions on the suggested antibiotic, the frequency, dose, and period for definite clinical circumstances.²¹ Antibiotic misuse is a developing issue because it is thought to be the primary contributor to the resistance of antibiotics.²² Consequently, choosing whether to prescribe antibiotics is important, and the advantages and disadvantages must be considered.²²

CONCLUSION

It was concluded that the several of the dentists were prescribing antibiotics for several oral conditions where local administration would be adequate as well as antibiotics were unnecessary. It is also well emphasized that the regulatory bodies must develop guidelines concerning antibiotic use based on accessible literature to avoid the development of resistance and to regulate the proper utilization of antibiotics. To avoid the further progress of antibiotic resistance, GPs require obvious guidelines as well as instructional schemes on antibiotics prescription.

REFERENCES

- 1 Ahsan S, Hydrie MZ, Hyder Naqvi SM, Shaikh MA, Shah MZ, Jafry SI. Antibiotic prescription patterns for treating dental infections in children among general and pediatric dentists in teaching institutions of Karachi, Pakistan. *PloS one*. 2020 Jul 10;15(7):e0235671.
- 2 Tanwir F, Marrone G, Lundborg CS. Knowledge and reported practice of antibiotic prescription by dentists for common oral problems. *J Coll Physicians Surg Pak*. 2013 Apr 1;23(4):276-81.
- 3 Tanwir F, Khan S. Antibiotic prescribing habits of dentists of major cities of Pakistan. *J Pak Dent Assoc* 2011; 20:160-3
- 4 Thoudam BD, Santosh HN, Bose A, Singh MN. Antibiotic prescription pattern among dentists in Imphal city of North East India: A cross-sectional survey study. *International Journal of Oral Health Sciences*. 2021 Jul 1;11(2):109.
- 5 Trostle J. Inappropriate distribution of medicines by professionals in developing countries. *Soc Sci Med* 1996; 42:1117-20.
- 6 Tanwir F, Khiyani F. Antibiotic resistance: a global concern. *J Coll Physicians Surg Pak* 2011; 21:127-9.
- 7 Dar-Odeh NS, Abu-Hammad OA, Al-Omiri MK, Khraisat AS, Shehabi AA. Antibiotic prescribing practices by dentists: a review. *Ther Clin Risk Manag* 2010; 6:301-6
- 8 Dar-Odeh NS, Abu-Hammad OA, Al-Omiri MK, Khraisat AS. Antibiotic prescribing practices by dentists: a review. *Ther Clin Risk Manag* 2010; 6:301-6
- 9 oveda Roda R, Bagan JV, Sanchis Bielsa JM, Carbonell Pastor E. Antibiotic use in dental practice: a review. *Med Oral Patol Oral Cir Bucal* 2007; 12:186-92
- 10 Singh J, Straznicki I, Avent M, Goss AN. Antibiotic prophylaxis for endocarditis: time to reconsider. *Aust Dent J* 2005; 50:60-8.
- 11 Dar-Odeh NS, Abu-Hammad OA, Khraisat AS, El Maaytah MA, Shehabi A. An analysis of therapeutic, adult antibiotic prescriptions issued by dental practitioners in Jordan. *Chemotherapy*. 2008;54(1):17-22.
- 12 Öcek Z, Sahin H, Baksi G. Development of a rational antibiotic usage course for dentists. *Eur J Dent Educ*.2008;12:41-47.
- 13 Murti A, Morse Z. Dental antibiotic prescription in Fijian adults. *Int Dent J*. 2007;57(2):65-70.
- 14 Nabavizadeh MR, Sahebi S, Nadian I. Antibiotic prescription for endodontic treatment: general dentist knowledge+ practice in shiraz. *Iranian endodontic journal*. 2011 Mar 16;6(2):54-9.
- 15 Saadat S, Mohiuddin S, Qureshi A. Antibiotic prescription practice of dental practitioners in a public sector institute of Karachi. *J Dow Uni Health Sci* 2013; 7(2): 54-58.
- 16 Baumgartner JC, Xia T. Antibiotic susceptibility of bacteria associated with endodontic abscesses. *J Endod* 2003;29:44-7.
- 17 Salinas MB, Riu NC, Aytes LB, Escoda CG. Antibiotic susceptibility of the bacteria causing odontogenic infections. *Med Oral Patol Oral Cir Bucal* 2006;44:70-5.
- 18 Abbott PV, Hume WR, Pearman JW. Antibiotics and endodontics. *Aust Dent J* 1990;35:50-60
- 19 Abbott PV. Selective and intelligent use of antibiotics in endodontics. *Aust Endod J* 2000;26:30-9
- 20 Martin MV, Longman LP, Palmer NA. Adult antimicrobial prescribing in primary dental care for general dental practitioners. *Faculty of General Dental Practitioners*; 2000.
- 21 Barker, G. R. &Qualtrough, A. J. E. An Investigation into antibiotic prescribing at a dental teaching hospital. *British Dental Journal* 1987;162; 303-6).
- 22 Al-Mashhadane FA. Uses and Misuses of Antibiotic in Dental Practice. A review. *Al-Rafidain Dental Journal*. 2020 Sep 1;20(2):195-204.