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Original Article

An Evaluation of Antibiotic Prescribing Practices among Dentists in Lahore: A Cross-sectional Study

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ABSTRACT

The appropriate use of antibiotics has become a major concern in healthcare. The over prescription and misuse of antibiotics has contributed to antibiotic resistance which has emerged as a major public health issue. **Objective:** The current study is conducted to investigate the antibiotic use by the dentists and to assess the conformity with evidence-based guidelines. **Methods:** A convenience sample of 216 dental practitioners were included in the study. A self-structured questionnaire was administered after getting consent from the participants. The questionnaire consisted of demographic details, self-reported usage of antibiotics in different clinical situations and questions exploring the practices regarding the use of antibiotics. Data were analyzed using SPSS version 24.0. **Results:** 87% of the participants prescribed antibiotics in irreversible pulpitis, 53.7% in dry socket and 78.7% in localized periapical abscess. Regarding their practice of antibiotic prescription, 77.8% participants reported the prescription of antibiotics in addition to the dental treatment for early resolution of the symptoms. 73.2 % reported that they fear the spread of infection if they have not prescribed antibiotics and 66.7% reported the use of antibiotics to defer the patient if the provision of treatment was not possible at the time. 68.9% participants reported that they would resort to some different antibiotic in case of persistent dental pain at the follow-up visit. **Conclusions:** The study shows indiscriminate and inappropriate use of antibiotics by the dentists. A lack of knowledge among the dental practitioners regarding the evidence-based clinical indications for antibiotics was evident.

INTRODUCTION

The use of antibiotics is an important element in the management of orofacial infections. However, the appropriate use of antibiotics has become a major concern in healthcare. Prudent use of antibiotics reduces the spread of infection to the adjacent tissues as well as the risk of systemic involvement [1]. Dentists are among the third highest prescribers of antibiotics in US [2]. However, there is substantial evidence of misuse of antibiotics by the dentists. According to reports on the prescription of antibiotics, as much as 85% of the dental antibiotic prescriptions are 'suboptimal' or 'not indicated' [3]. There are numerous studies and surveys which report the misuse and over-prescription of antibiotics by dentists globally [4]. Moreover, prescribing antibiotics when they are not indicated causes unnecessary adverse effects in the patients such as gastrointestinal disturbances, allergic responses and antibiotic resistance. Antibiotic resistance refers to the resistance of a microorganism to an antibiotic that was originally effective for treatment of infections caused by it. As a result, that antibiotic will no longer act on that microbe. This implies that the common infections which are treatable can no longer be managed. Antibiotic resistance which has emerged as a major public health issue. According to the Center of Disease Control (CDC),

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annually 23,000 deaths and 2 million illnesses have been attributed to antibiotic resistant strains [5]. A retrospective cohort study conducted in UK revealed that antibiotics were prescribed in majority of the dental consultations [6]. In order to address this emerging issue, various organizations have developed guidelines to help the dental practitioners for decision making regarding the use of antibiotics including American Dental Association (ADA) [7], American Association of Endodontics (AAE) [8] and American Academy of Pediatric Dentistry (AAPD) [1]. However, poor adherence to these guidelines has been reported. It has also been observed that developing countries with weaker healthcare systems are more likely to be affected owing to easy availability of over-the-counter antibiotics and lack of access to professional healthcare [9,10]. This gives us an insight to the potential damage, an erroneous prescription of antibiotic can cause. This also warrants monitoring and control of antibiotic usage. With this backdrop, it is imperative to explore the antibiotic prescribing practices among dental practitioners. The current study is conducted to investigate the antibiotic use by the dentists and to assess the conformity with evidence-based guidelines.

METHODS

The study was approved by institutional Ethical Review Board, University College of Dentistry, The University of Lahore (UCD/ERCA/21/11de). A convenience sample of 216 dental practitioners were included in the study consisting of both academic and non-academic dentists. Dentists who were not into clinical practice were excluded. A self-structured questionnaire was administered after getting consent from the participants. The questionnaire consisted of demographic details of the participants, self-reported usage of antibiotics in different clinical conditions and questions exploring the practices regarding the use of antibiotics in different clinical scenarios. The data was collected and analyzed by SPSS version 24.0.

RESULTS

Of the 216 participants of the study, 46.7% (n=101) were males and 53.3% (n=115) were females. 23.6 % (n=51) had clinical experience of less than 5 years, 66.7 % (n=144) between 5-10 years and 9.7% (n=21) had greater than 10 years of clinical experience. 81.1% (n=175) of the participants were general dentists while 18.9% (n=41) were specialists. The self-reported response by the participants regarding use of antibiotics in various clinical conditions has been summarized in Table 1.

Clinical Condition	Use of antibiotics among participants % (n)
Reversible Pulpitis	15.7 (34%)
Pericronitis	44 (95%)
Dry Socket	53.7 (116%)
Simple Extraction	61.1 (132%)
Apical Periodontitis	65.7 (142%)
Periodontal diseases	75 (162%)
Localized Periapical Abscess	78.7 (170%)
Surgical Extraction	80.5 (174%)
Dental Trauma	82.9 (179%)
Acute Irreversible Pulpitis	87 (188%)
Facial swelling without systemic involvement	91.2 (197%)
Facial Swelling with systemic involvement	100 (216%)

Table 1: Self-reported usage of antibiotics among participants in different clinical conditions

The participants were also given clinical scenarios to assess their use of antibiotics in different clinical conditions. The results are summarized in Table 2. Exploring the commonly used antibiotics in their prescription, 76.8% participants commonly prescribe Co-amoxiclav, 45.4% give Amoxicillin, 43.1% give metronidazole, 41.2% give Cephalosporin and 50.9 % chose 'others'. 35.2% (n=76) of the participants reported that they were aware of the guidelines regarding antibiotic prescription. Regarding their practice of antibiotic prescription, 77.8% (n=168) participants reported the use of antibiotics in addition to the dental treatment for early resolution of the symptoms. 73.2 % (n=158) participants reported that they feared the spread of infection if they have not prescribed antibiotics. 66.7% (n=144) reported the use of antibiotics to defer the patient if the provision of treatment was not possible at the time. 68.9% (n=149) participants reported that they would resort to some different antibiotic in case of persistent dental pain at the follow-up visit.

Clinical Scenario	Use of antibiotics among participants % (n)
Facial Cellulitis, febrile patient	100 (216%)
Severe nocturnal and spontaneous pain in carious tooth, afebrile patient, endodontic treatment not performed	93 (201%)
Severe nocturnal and spontaneous pain in carious tooth, afebrile patient, root canal treatment performed	88.9 (192%)
Localized gingival swelling/abscess (parulis) secondary to pulp necrosis, afebrile patient	83.8 (181)
Pericronitis in wisdom tooth, afebrile patient	50.9 (110)

Table 2: Response of the participants regarding use of antibiotics in different clinical scenarios

DISCUSSION

Over-prescription and misuse of the antibiotics was evident among the participants as the majority of the practitioners prescribe antibiotics where they are not indicated. An overuse of antibiotics was observed for acute

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irreversible pulpitis, localized periapical abscess, Pericronitis, dry socket and simple extractions. The most over-prescription of antibiotics was reported for facial swelling without systemic involvement (91.2%), followed by acute-irreversible pulpitis (87%) and localized periapical abscess (78.7%). Similar misuse of the antibiotics by the dentists has been reported in the literature worldwide even though most dentists self-report adherence to guidelines [11-13]. An erroneous prescription of antibiotics has been reported by A. Agnihotry et al. and A. Cope in their extensive literature reviews where dentists prescribe antibiotics in situations when they are not indicated [14-15]. A survey reported that as much as 37% of the US endodontists unnecessarily prescribed antibiotics mainly because of patient expectations [16]. The use of antibiotics is neither indicated nor effective for odontogenic infections like pulpitis/apical periodontitis/draining sinus tract/localized intra-oral swelling unless there is evidence of septicemia [3]. These conditions should be addressed by prompt dental treatment to eliminate the source of infection [17-18]. Antibiotics are ineffective in such conditions as there is lack of circulation in a necrotic pulp so they fail to reach the source of infection. Antibiotics are only indicated in such patients with systemic involvement such as pyrexia, lymphadenopathy, etc [19]. The results in Table 2 highlight the indiscriminate use of antibiotics by our dental practitioners whereby participants showed lack of adherence to the guidelines. 77.8% of the participants reported adjunct use of antibiotics along with the endodontic treatment to ensure early resolution of symptoms while 73.2% fear the spread of the infection if the antibiotics were not prescribed. Similarly, a cross-sectional study conducted in Wales, UK reported the use of 70.6% of antibiotics without any dental intervention [4]. The common reasons for prescribing antibiotics include patient expectations, patient preferences, time constraints and non-compliance of patients with the dental treatment [20]. WM Walton advocated that it is the moral and ethical duty of the dentist to warn the patients regarding the misuse of antibiotics and not to comply to their requests for antibiotic prescription [21]. The study also shows injudicious use of antibiotics for traumatic dental injuries. The International Association of Dental Traumatology does not recommend the use of systemic antibiotics unless dictated by concomitant soft tissue injuries or patient's medical status [22]. Amoxicillin and Co-amoxiclav were the most favored antibiotic choices which is in-line with the available guidelines [23]. However, 50.9% of the participants reported use of 'other' antibiotics which shows lack of adherence to the guidelines.

CONCLUSIONS

The results of the study show indiscriminate and inappropriate use of antibiotics by the dentists. A lack of knowledge among the dental practitioners regarding the evidence-based clinical indications for antibiotics is evident. There is a need to increase awareness regarding the prescription of antibiotics according to the updated guidelines through continuing education programs and it should be well emphasized in the undergraduate dental curriculum.

Conflicts of Interest

The authors declare no conflict of interest.

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REFERENCES

[1] Guideline on Use of Antibiotic Therapy for Pediatric Dental Patients. Pediatric dental journal. 2016 Oct; 38(6):325-327.

[2] Durkin MJ, Hsueh K, Sallah YH, Feng Q, Jafarzadeh SR, Munshi KD, et al; Centers for Disease Control and Prevention Epicenters. An evaluation of dental antibiotic prescribing practices in the United States. American journal of dentistry. 2017 Dec; 148(12):878-886.e1. doi: 10.1016/j.adaj.2017.07.019.

[3] Lockhart PB, Tampi MP, Abt E, Aminoshariae A, Durkin MJ, Fouad AF, et al. Evidence-based clinical practice guideline on antibiotic use for the urgent management of pulpal- and periapical-related dental pain and intraoral swelling: A report from the American Dental Association. American journal of dentistry. 2019 Nov; 150(11):906-921.e12. doi: 10.1016/j.adaj.2019.08.020.

[4] Cope AL, Francis NA, Wood F, Chestnutt IG. Antibiotic prescribing in UK general dental practice: a cross-sectional study. Community Dentistry and Oral Epidemiology. 2016 Apr; 44(2):145-53. doi: 10.1111/cdoe.12199.

[5] US Department of Health and Human Services. Antibiotic resistance threats in the United States, 2013. Centers for disease control and prevention. 2013 Apr; 1-13.

[6] Cope AL, Chestnutt IG, Wood F, Francis NA. Dental consultations in UK general practice and antibiotic prescribing rates: a retrospective cohort study. The British journal of general practice. 2016 May; 66(646): e329-36. doi: 10.3399/bjgp16X684757.

[7] Lamont T, Worthington HV, Clarkson JE, Beirne PV. Routine scale and polish for periodontal health in adults. Cochrane database of systematic reviews. 2018 Dec; 12(12):CD004625. doi: 10.1002/14651858.CD004625.pub5.

[8] Fouad AF, Byrne BE, Diogenes AR, Sedgley CM, Cha

DOI: https://doi.org/10.54393/pjhs.v3i04.84

BY. AAE guidance on the use of systemic antibiotics in endodontics, AAE position statement. 2017.
[9] Carlin K, Löfmark S, Blad L. Swedish Work on Containment of Antibiotic Resistance: Tools, Methods and Experiences. Public Health Agency of Sweden; 2014.
[10] Singh PK. A universal good: How increased health coverage can help beat back antimicrobial resistance. World Health Organization, Regional Office for South-East Asia. 2017.
[11] Ramadan AM, Rikaby OA, Abu-Hammad OA, Dar-Odeh NS. Knowledge and attitudes towards antibiotic prescribing among dentists in Sudan. Pesquisa Brasileira em Odontopediatria e Clínica Integrada. 2019 Sep;19.
[12] Dar-Odeh NS, Abu-Hammad OA, Al-Omiri MK, Khraisat AS, Shehabi AA. Antibiotic prescribing practices by dentists: a review. Therapeutics and Clinical Risk Management. 2010 Jul; 6:301-6. doi: 10.2147/tcrm. s9736.
[13] Sivaraman SS, Hassan M, Pearson JM. A national survey of pediatric dentists on antibiotic use in children. Pediatric Dentistry. 2013 Nov; 35(7):546-9.
[14] Cope AL, Francis N, Wood F, Chestnutt IG. Systemic antibiotics for symptomatic apical periodontitis and acute apical abscess in adults. Cochrane database of systematic reviews. 2018 Sep; 9(9):CD010136. doi: 10.1002/14651858.CD010136.pub3.
[15] Agnihotry A, Thompson W, Fedorowicz Z, van Zuuren EJ, Sprakel J. Antibiotic use for irreversible pulpitis. Cochrane database of systematic reviews. 2019 May; 5(5):CD004969. doi: 10.1002/14651858.CD004969. pub5.
[16] Germack M, Sedgley CM, Sabbah W, Whitten B. Antibiotic Use in 2016 by Members of the American Association of Endodontists: Report of a National Survey. Journal of endodontics. 2017 Oct; 43(10):1615-1622. doi: 10.1016/j.joen.2017.05.009.
[17] Matthews DC, Sutherland S, Basrani B. Emergency management of acute apical abscesses in the permanent dentition: a systematic review of the literature. Database of Abstracts of Reviews of Effects (DARE): Quality-assessed Reviews [Internet]. 2003.
[18] Marra F, George D, Chong M, Sutherland S, Patrick DM. Antibiotic prescribing by dentists has increased: Why? American journal of dentistry 2016 May; 147(5):320-7. doi: 10.1016/j.adaj.2015.12.014.
[19] Aminoshariae A and Kulild JC. Evidence-based recommendations for antibiotic usage to treat endodontic infections and pain: A systematic review of randomized controlled trials. American journal of dentistry. 2016 Mar; 147(3):186-91. doi: 10.1016/j.adaj. 2015.11.002.
[20] Sturrock A, Landes D, Robson T, Bird L, Ojelabi A, Ling J. An audit of antimicrobial prescribing by dental practitioners in the north east of England and Cumbria. BMC Oral Health. 2018 Dec; 18(1):206. doi: 10.1186/s12903-018-0682-4.
[21] Walton WM. What should I do when a patient just wants antibiotics? American journal of dentistry. 2016 May; 147(5):382-3. doi: 10.1016/j.adaj.2016.02. 015.
[22] Levin L, Day PF, Hicks L, O'Connell A, Fouad AF, Bourguignon C, et al. International Association of Dental Traumatology guidelines for the management of traumatic dental injuries: General introduction. Dental Traumatology. 2020 Aug; 36(4):309-313. doi: 10.1111/edt.12574.
[23] Roberts RM, Bartoces M, Thompson SE, Hicks LA. Antibiotic prescribing by general dentists in the United States, 2013. American journal of dentistry. 2017 Mar; 148(3):172-178.e1. doi: 10.1016/j. adaj.2016.11.020.