



A SURVEY ON ANTIBIOTICS PRESCRIBED DURING ENDODONTIC TREATMENT AMONGST GENERAL DENTISTS AND SPECIALISTS.

Endodontic

Dr. Shatakshi B. Bartere *	Post Graduate student, Department of Conservative Dentistry and Endodontics, V.Y.W.S. Dental College & Hospital, Amravati, Maharashtra, India.* Corresponding Author
Dr. Anant A. Heda	Professor, Department of Conservative Dentistry and Endodontics, VYWS Dental College & Hospital, Amravati, Maharashtra, India.
Dr. Narendra U. Manwar	Professor and Head, Department of Conservative Dentistry and Endodontics, VYWS Dental College & Hospital, Amravati, Maharashtra, India.
Dr. Chandani Bhatia(Adwani)	Senior Lecturer, Department of Conservative Dentistry and Endodontics, VYWS Dental College & Hospital, Amravati, Maharashtra, India.
Dr. Neelam Rahul	Senior Lecturer, Department of Conservative Dentistry and Endodontics, VYWS Dental College & Hospital, Amravati, Maharashtra, India.
Dr. Gayatri Deshmukh	Post Graduate student, Department of Conservative Dentistry and Endodontics, VYWS Dental College & Hospital, Amravati, Maharashtra, India.

ABSTRACT

Aim: The present study was conducted to compare the antibiotic prescription pattern during endodontic treatment amongst general dentists and specialists.

Methodology: A questionnaire consisting of 10 questions for this survey regarding antibiotics used in endodontics was constructed using Survey Monkey, an internet survey tool. A link was generated and shared to 115 participants via e-mail. The collected data was then statistically analyzed.

Results: The present survey link was shared with 115 candidates, included general dentists and Endodontists in and around Amravati District region, Maharashtra, India. Amongst 115 samples, 100 completed the survey, thereby achieving the response rate of 86.95%. Amoxicillin + clavulanic acid (77.78) was the first drug of choice. For a scenario of penicillin allergic patients, first drug of choice in that case will be cephalosporin (31.52%). Majority of professionals (73.20%) prescribe antibiotics before starting endodontic treatment for 3 days. Maximum professionals (93.81%) agree that their prescription vary when there is an evidence of anaerobic infection. Professionals, use antibiotics as intracanal medicament during endodontic treatment (61.61%). Generally dental professionals does not indicate antibiotic to a pregnant patient undergoing endodontic treatment (61.46). The awareness regarding antibiotic prophylaxis was found to be adequate (66.67%) amongst practitioners. However, there was a lack of awareness regarding the antibiotic prescription amongst one third of the practitioners.

Conclusion: The majority of professionals correctly select the antibiotics regarding endodontic infections. However, there are still professionals that inadvertently apply antibiotic therapy. Practitioners should prescribe antibiotics in accordance with the guidelines to prevent the overuse of antibiotic.

KEYWORDS

Antibiotics, Endodontics, Antibiotic prophylaxis

INTRODUCTION

The success rate of endodontic procedures had gained lot of popularity. The rationale of endodontic treatment is to eradicate the infection, to prevent micro-organisms from infecting or re-infecting the root canal and periradicular tissues. Antibiotics are prescribed before, during and after endodontic treatment. Antibiotics are prescribed for a variety of dental treatments; they are generally prescribed for real or perceived endodontic problems. During endodontic procedure, antibiotics can be prescribed systemically or given locally. Systemic antibiotics should be prescribed for dental infections on the basis of various indications like acute apical abscess in medically compromised patients and acute apical abscess with systemic involvement.¹ The local application of antibiotics is an effective mode of disinfection in endodontics because systemic antibiotics fail to reach the necrotic pulp.²

According to the American Association of Endodontists (AAE) guidelines (2017)³, the objectives for the treatment of endodontic infections are removal of the pathogenic microorganisms, their by products, and pulpal debris from the infected root canal system and establishment of conditions that favor the lesion to heal. Antibiotics must only be used as an additive therapy in patients with systemic manifestations such as fever, lymphadenopathies etc., following adequate endodontic disinfection or abscess drainage or when spreading infections such as cellulitis are present.⁴

The overuse or misuse of antibiotics results in the development of resistance traits in bacterial populations.⁵ Overusing antibiotics or using them irrationally can easily result not only in the emergence of resistant bacterial strains but also in adverse reactions and can also result in an economic burden on the national health system.⁶

Therefore, the aim of the present survey was to evaluate the behavior of prescribing antibiotics amongst interns, general dentists and specialists, considering different cases and specific patient's characteristics.

MATERIAL AND METHODS

The study was approved and ethical clearance was obtained from ethical committee. A questionnaire consisting of 10 questions for this survey regarding antibiotics used in endodontics was constructed using survey monkey an internet survey tool. The present survey link was shared with 115 candidates via email, included general dentists and Endodontists in and around Amravati District region, Maharashtra, India. Both male and female dentists were involved. Dentists who were not willing to participate in the study were excluded. A reminder email was given after 1 month. The study was conducted over a period of 2 months. The collected data was then statistically analyzed.

RESULTS

Present survey link was shared among 115 samples out of which 100 completed the survey, thereby achieving the response rate of 86.95%.

Table 1: Questionnaire and Responses to Questionnaire

	Responses(n)	(n%)
Q.1 Which is the antibiotic of choice for patients undergoing endodontic treatment?		
• Amoxicillin	20.20%	20
• Amoxicillin+ clavulanic acid	77.78%	77
• Clindamycin	0.00%	0
• Azithromycin	0.00%	0
• Metronidazole	2.02%	2

Q.2 Which antibiotic do you prescribe for penicillin allergic patients undergoing endodontic treatment?		
• Clindamycin	16.30%	15
• Azithromycin	30.43%	28
• Metronidazole	20.65%	19
• Cephalosporin	31.52%	29
• Lincomycin	1.09%	1
Q.3 Minimum number of days for prescribing antibiotics:		
• 1	0.00%	0
• 3	77.78%	77
• 5	19.19%	19
• 7	3.03%	3
Q.4 Most common route of administration of antibiotics		
• Oral	100%	99
• Intravenous	0.00%	0
Q.5 Do you prescribe antibiotics before starting endodontic treatment?		
• Yes	73.20%	71
• No	26.80%	26
Q.6 In which of the following conditions do you prescribe antibiotic therapy?		
• Irreversible pulpitis, moderate/severe pain	9.38%	9
• Necrotic pulp without swelling, no pain/light pain	1.04%	1
• Necrotic pulp without swelling, moderate/severe pain.	3.13%	3
• Necrotic pulp with swelling, no pain/light pain	4.17%	4
• Necrotic pulp with swelling, moderate/severe pain	31.25%	30
• All of the above	51.04%	49
Q.7 Does your prescription vary when there is an evidence of anaerobic infection		
• Yes	93.83%	91
• No	6.19%	6
Q.8 Do you use antibiotics as intracanal medicament during endodontic treatment?		
• Yes	60.61%	60
• No	39.39%	39
Q.9 Do you prescribe antibiotics to a pregnant patient undergoing endodontic treatment?		
• Yes	38.54%	37
• No	61.46%	59
Q.10 Are you aware of current guidelines for "antibiotic prophylaxis" and do you follow them		
• Yes	66.67%	64
• No	33.33%	32

DISCUSSION

Antibiotics are an important class of drugs. Benefits of correct use of antibiotics are resolution of infection, prevention of the spread of disease and minimization of serious complications of disease⁶. Every treatment is directly related to an adequate diagnosis and treatment planning, being the medication therapy only an adjunct and never a substitute for the localized action of the actual treatment⁷.

The present study evaluated the antibiotic prescribing practices among the dental surgeons which include general dentists and specialist. In the present study questions were based on the concepts for antibiotics during endodontic treatment. In the present study the questions were based on those in previous surveys performed in the Kolkata West Bengal, India⁸ and in Shiraz, Iran⁹.

The success of endodontic treatment is directly proportional/depends on the proper diagnosis and treatment plan, being the medication therapy only an adjunct and never a substitute. Dentist must be able to take decision regarding the indication for antibiotics in different clinical or pathological conditions. Amoxicillin was the first choice antibiotic prescribed in endodontic infection in most of the surveys. Amoxicillin, a penicillin derivative with a broader spectrum, is a good choice for immunocompromised patients. It is a good drug for orofacial infections because it is readily absorbed and can be taken with food. According to present survey, majority of respondents chose

amoxicillin + clavulanic acid (77.78), for patients undergoing endodontic treatment while 20.20% selected amoxicillin alone and 2.02% selected metronidazole. If the patient was found to be allergic to penicillin, first drug of choice in that case will be cephalosporin (31.52%), followed by azithromycin (30.43%), metronidazole (20.65), Clindamycin (16.30), Lincomycin (1.09%). The results of the present study were in contrast with previous studies where clindamycin was the first choice of drug when the patient is allergic to penicillin^{10,11}.

The therapeutic success depends on the time for antibiotic therapy administered, inadequate duration or overdose. In the present study, many respondents responded that they prefer antibiotics for a minimum of 3 days (77.78%), while a considerable number of respondents prescribe antibiotics for 5 days (19.19%). Orofacial infections typically have a rapid onset and short duration, 2 to 7 days or less, particularly if the cause is treated or eliminated. When the infection is resolving or has resolved, then the drug should be terminated. Prolonged use of antibiotics may lead to the antibiotic resistance. All the respondents agree for oral route as the most common route of administration of antibiotics.

The American association of endodontics considers it reasonable to administer prophylaxis for patients at risk of systemic disease prior to a dental procedure that involves the gums, the periapical region (roots) of teeth or the oral tissues. In the present study, majority of professionals (73.20%) prescribe antibiotics before starting endodontic treatment. Conditions like irreversible pulpitis with moderate symptoms do not need antibiotic coverage. Despite this fact, according to present survey, (9.38%) professionals prescribed antibiotics for the irreversible pulpitis scenario. Generally, professionals indicate antibiotics in cases with necrotic pulp with swelling, moderate / severe pain (31.25%). Majority of professionals has selected the all of the above option (51.04%). Maximum professionals (93.81%) agree that their prescription vary when there is an evidence of anaerobic infection. Metronidazole is an antibiotic that is very effective against obligate anaerobes.

Antibiotics can be used in various modalities in endodontics. The First local use of antibiotics in endodontics was by Dr. Louis Grossman, Father of Endodontics. The use of intracanal medicament is beneficial in treating endodontic infections. On discussing the use of intracanal medicament 61.61% professionals, use antibiotics as intracanal medicament during endodontic treatment. However, 39.39% of professional's did not use antibiotics as intracanal medicament during endodontic treatment.

Prescription of antibiotics to a pregnant patient undergoing endodontic treatment is one of the important questions arising amongst the dental practitioners. According to this survey, 61.46% of professionals does not indicate antibiotic to a pregnant patient undergoing endodontic treatment and 39.39% professionals prescribe antibiotics in pregnant patient scenario. Generally, antibiotic prescription should be avoided entirely during pregnancy. First and last trimester are periods of greater risk for antibiotic drug use. Penicillin, including amoxicillin and cephalosporin, has been generally considered as safe during pregnancy if indicated.¹² Antibiotic prophylaxis is of great importance, according to this survey 66.67% professionals were aware of the current guidelines for "antibiotic prophylaxis" and they follow them whereas 33.33% of professionals are not aware about it. Guidelines have been updated by the expert committees around the world. In the UK, NICE (National institute for health and care excellence) concluded to recommend no routine antibiotic prophylaxis for dental treatment for patients at risk of infective endocarditis¹³. The recent guidelines from the British Society for Antimicrobial Chemotherapy¹⁴ recommend that only patients in the high-risk category require coverage. The bases for this are as follows:

- The development of infective endocarditis does not require a prior intervention of any form, dental or non-dental.
- The effectiveness of prescribing antibiotics prophylactically has not been proven clinically.
- Antibiotics when prescribed prophylactically prior to dental procedure present a greater risk of death through anaphylaxis than a protocol of no antibiotic prescription.
- The daily act of tooth brushing itself presents as a risk of infective endocarditis.
- Antibiotic prophylaxis is not cost-effective.

On the basis of the results of this study, it was noted that the great

majority of specialists correctly adopts antibiotic therapy regarding endodontic infections, although still one third of them inadvertently prescribes antibiotics. The scientific basis for prescribing antibiotics was ignored by the majority of dental surgeons. Dental professionals need to have a thorough understanding regarding clinical indications for antibiotic prescriptions in order to prevent the overuse or misuse of these drugs.

CONCLUSION

Over prescribing antibiotics could be a major contribution to the worldwide problem of antimicrobial resistance. The majority of specialists correctly prescribe antibiotics. However, there are still professionals that inadvertently apply antibiotic therapy. This fact favors bacterial resistance and also exposes patients unnecessarily to adverse side effects of medications. There is an urgent need to raise public and professional awareness regarding the risks of overuse of antibiotics in dentistry.

REFERENCES

1. Miles M. Anaesthetics, Analgesics, Antibiotics and endodontic. *Dent Clin North Am*, 1984; 28: 865-82.
2. Gilad JZ, Teles R, Goodson M, White RR, Stastienko P. Development of a clindamycin impregnated fiber as an intercanal medication in endodontic therapy. *J Endod*, 1999; 25:722-727.
3. AAE Position Statement. AAE guidance on the use of systemic antibiotics in endodontics. *JOE* 2017;43:1409-1413.
4. Aminoshariae A, Kulild JC. Evidence-based recommendations for antibiotic usage to treat endodontic infections and pain: A systematic review of randomized controlled trials. *J Am Dent Assoc* 2016;147:186-191.
5. MA, Walsh CT. Antibiotics for emerging pathogens. *Science*. 2009;325:1089–1093.
6. Fouad AF. Are antibiotics effective for endodontic use? an evidence-based review. *Endodontic Topics* 2002;3:52-66.
7. Harrison JW, Svec TA. The beginning of the end of the antibiotic era? Part II. Proposed solutions to antibiotic abuse. *Quintessence Int*. 1998;29(4):223-229.
8. Kaul R, Angrish P, Jain P, Saha S, Sengupta AV, Mukherjee S. A Survey on the Use of Antibiotics among the Dentists of Kolkata, West Bengal, India. *International journal of clinical pediatric dentistry*. 2018 Mar;11(2):122-127.
9. Nabavizadeh MR, Sahebi S, Nadian I. Antibiotic prescription for endodontic treatment: general dentist knowledge+ practice in shiraz. *Iranian endodontic journal*. 2011;6(2):54-59.
10. Yingling NM, Byrne BE, Hartwell GR. Antibiotic use by members of the American Association of Endodontists in the year 2000: report of a national survey. *J Endod* 2002 May;28(5):396-404.
11. Whitten BH, Gardiner DL, Jeannsonne BG, Lemon RR. Current trends in endodontic treatment: report of a national survey. *J Am Dent Assoc* 1996 Sep; 127(9):1333-1341.
12. Miller MC. The pregnant dental patient. *CDAJ*. 1995; 23(8):63-70.
13. National Institute for Health and Care Excellence. Recommendation. In: *Prophylaxis against infective endocarditis: antimicrobial prophylaxis against infective endocarditis in adults and children undergoing interventional procedures*. London: NICE; 2016.
14. Gould FK, Elliott TS, Foweraker J, Fulford M, Perry JD, Roberts GJ, et al.; Working Party of the British Society for Antimicrobial Chemotherapy. Guidelines for the prevention of endocarditis: Report of the Working Party of the British Society for Antimicrobial Chemotherapy. *J Antimicrob Chemother* 2006;57:1035-1042.