Original Article

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The Attitudes of Dentists Towards the Prescription of Antibiotics During Endodontic Treatment in North of Saudi Arabia

Dentistry Section

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ABSTRACT

Objective: The use of antimicrobial agents has been increased, leading to bacterial resistance. Therefore the health professionals should have a sound knowledge about the prescription of antibiotics to overcome the increasing bacterial resistance. The main objective of this study was to evaluate the attitudes of dentists towards the prescription of antibiotics during endodontic treatment in north of Saudi Arabia.

Materials and Methods: This was a survey based descriptive cross-sectional study. This study has been done among the dentists of northern region of Saudi Arabia. A questionnaire was designed, regarding pattern of prescription of antibiotics by the dentists in the north of Saudi Arabia and the use of antibiotics in the treatment of different endodontic conditions during endodontic treatment. This questionnaire was distributed among 200 dentists in the north of Saudi Arabia. This study will encourage the dentists of the northern region of Saudi Arabia to be up to date about the current and prospective guidelines for the prescription of antibiotics and follow these guidelines for the antibiotic prescription.

Results: The collected information was analysed by using a computer software SPSS version 18. Majority of the dentists were male accounting for 86%. The age range for 68% of the respondents was 25-35 years. Most of the dentists were having just a basic dental qualification i.e. 65.60%. Out of the total responding dentists, 50% were working in the ministry of health. 77% of the respondents prescribed the antibiotics for necrotic pulp with acute apical periodontitis; swelling present; mod/severe preoperative symptoms. Out of the total responding dentists, 45.2% prescribed amoxicillin and clavulanic acid combination as the drug of choice.

Conclusion: It is concluded from the present study that the dentists should know the scientific basis for the prescription of antibiotics during endodontic therapy. They should follow and should not neglect the current guidelines for antibiotic prescriptions. There should be community awareness programmes for the dentists regarding the misuse of antibiotics and antibiotic resistance so that they can play a role in controlling these global problems.

Keywords: Antimicrobials, Dental practitioners, Endodontic pain

INTRODUCTION

Antibiotics are antimicrobials which destroy or slow down the growth of bacteria. The primary function of the antibiotics is to treat the bacterial infection. But unnecessary use of antibiotics would increase the risk of antibiotic resistance. This antibiotic resistance will make the bacteria nonresponsive to the action of given antimicrobial agent and these bacteria will continue their growth and multiplication [1]. Bacterial resistance to antibiotics has become a challenge for clinicians since the discovery of antibiotics because bacteria have succeeded in developing resistance to all antibacterial agents shortly after they had been marketed [2]. In addition to bacterial resistance inappropriate prescription of antibiotics is also associated with several adverse effects on general population [3], ranging from gastrointestinal disturbances to fatal anaphylactic shocks, emergence and dissemination of some species through genetic pathway along with economic misuse [4]. These adverse reactions have drawn the attention of health care professionals, scientists and policy makers towards the problem of antibiotic misuse [3,4].

In dentistry, antibiotics are prescribed for the treatment of odontogenic infections, especially endodontic infections, and prophylaxis of local and systemic spread. The data from different studies showed that 70% of the patients of age 35-44 years have been diagnosed with apical Periodontitis [5]. A survey done in UK, involving more than 6000 dentists showed that 40% of the dentists were prescribing antibiotics at least thrice per week [6]. It has also been shown through research that 15% of the dentists were prescribing the antibiotics daily and such prescription pattern has proved to be unnecessary and inappropriate. Endodontic pain i.e. pain induced by inflammation of dental pulp or periapical tissues alone is not an indication for antimicrobial treatment. The vast majority of infections of endodontic origin could be managed without antibiotics [7,8]. Incorrect use of antibiotics in dentistry may predispose secondary and super infections and render drugs ineffective against potentially fatal medical infectious diseases besides the overhead financial burden on the patients [9]. Some of the factors which influence the prescription of antibiotics are the patient's expectations for an antibiotic prescription and dentist's sound knowledge about the antibiotic prescription [10,11]. Recently the usage of antibiotics for the prophylaxis of infective endocarditis has been changed therefore this has resulted in differences in antibiotic prescription practice among the dentist in different countries. Due to the lack of proper guidelines, differences in the prescription practices have been common [12]. To the best of our knowledge very few studies have been done to highlight this issue in Kingdom of Saudi Arabia (KSA). In general and in particular no study has been done in the northern region of KSA. Therefore, this study will be very helpful to know about the knowledge and practice of general dental practitioners about antibiotic prescription during endodontic treatment. This study will be expected to be a step forward in improving the prevailing practicing scenario at large.

MATERIALS AND METHODS

This was a survey based descriptive study. This study has been done among the dentists of northern region of Saudi Arabia. This was the first study of its kind, done in this region of Saudi Arabia. A questionnaire was designed, regarding pattern of prescription of antibiotics by the dentists in northern region of Saudi Arabia and use of antibiotics in the treatment of different endodontic conditions during endodontic treatment. This questionnaire was distributed

among 200 dentists in the north of Saudi Arabia. This study will encourage the dentists of the northern region of Saudi Arabia to be up to date about the current and prospective guidelines for the prescription of antibiotics and follow these guidelines for the antibiotic prescription.

RESULTS

In the present study out of total 200 dentists 157 has responded and the response rate was 78.5%. The demographic characteristics of the responding dentists are described in [Table/Fig-1]. In [Table/Fig-2] the percentage of the responding dentists is listed who were prescribing the antibiotics for various pulpal and periapical conditions. The antibiotic choice of the responding dentists was indicated in [Table/Fig-3].

Gender		
Male	135	86%
Female	22	14%
Age (Years)		
25-35	107	68%
36-45	30	19.10%
46-55	15	9.55%
56-65	5	3.18
Academic Qualification		
BDS	103	65.60%
M.Sc	20	12.73%
Fellowship	16	10.19%
Board Certification	10	6.3%
Ph.D	8	5%
Working places		
Ministry of health hospitals	79	50%
Private dental clinics	65	41.4%
University dental clinics	13	8.2%

[Table/Fig-1]: Demographic Informations of the dentists

No	Endodontic conditions	Frequency	Percentage
1	NP with acute apical periodontitis; swelling present; mod/ severe preoperative symptoms	121	77%
2	NP with acute apical periodontitis; no swelling; mod /severe preoperative symptoms	93	59%
3	NP with chronic apical periodontitis; sinus tract present; no/mild preoperative symptoms	73	46.4%
4	IP with acute apical periodontitis; moderate/severe preoperative symptoms	67	42%
5	NP with chronic apical periodontitis; no swelling, no/mild preoperative symptoms	37	23.5%
6	IP with moderate/severe preoperative symptoms	43	27.3%

[Table/Fig-2]: The endodontic conditions in which antibiotics were prescribed
NP: Necrotic Pulp
IP: Irreversible Pulpitis

No	Antibiotics	Frequency	Percentage
1	Amoxicillin and clavulanic acid in combination	71	45.2%
2	Amoxicillin	53	33.7%
3	Amoxicillin and Metronidazole in combination	24	15%
4	Clindamycin	7	4.4%
5	Cephalosporines	4	2.5%
6	Metronidazole	9	5.7%

[Table/Fig-3]: Antibiotics Prescribed by dentists

DISCUSSION

In this questionnaire based cross-sectional study, the antibiotic prescription pattern of the dentists has been evaluated. The questions and endodontic conditions which have been proposed in our questionnaire were based on those which have been proposed in previous surveys and done in USA [13], Spain [14] and India [15]. This study has shown 78.5% response rate. The 78.5% response rate is considered as an acceptable rate for a survey based study. To prescribe the antibiotics for an endodontic infection, the endodontic infection must be persistent or it should have a systemic involvement i.e. high grade fever, swelling, lymphadenopathy, trismus or malaise [13] otherwise antibiotic prescriptions is not justified.

In the present study [Table/Fig-2] shows the percentages of respondents who prescribe the antibiotics for various endodontic conditions. In our study the first condition of necrotic pulp with acute apical periodontitis, swelling and mod/ severe preoperative symptoms got 77% antibiotic prescription by the responding dentists. If this is agreed that this condition has the systemic involvement then antibiotic prescription is justified along with nonsurgical debridement of the root canal system and incision and drainage. 77% response rate in the present study is comparable with response rates of 90.2% and 94.5% of Indian and Spanish dentists respectively for this condition [14,15].

In the present study the second condition of necrotic pulp with acute apical Periodontitis, no swelling and mod/severe preoperative symptoms got 59% antibiotic prescriptions by the responding dentists. This 59% response rate is considerably high and it is similar to the previous studies, having the response range from 30%-71% [13,15,16]. The 59% response rate in our study shows an over-use of antibiotics for this condition. Ideally there is no need of antibiotic prescription in this condition and proper treatment for this condition is non- surgical root canal treatment and analgesics. The third endodontic condition in our study was necrotic pulp with chronic apical periodontitis, sinus tract and no or mild preoperative symptoms. Although the effective management of this condition without systemic involvement is, non surgical endodontic treatment, to remove the cause along with drainage and analgesics for pain if indicated, but 46.4% of the respondents prescribed the antibiotics even in this condition, which seemed to be unjustified. But if the patient is having acute flare up along with systemic involvement, and sinus tract is not healed then antibiotic prescription is justified.

The fourth endodontic condition in the present study was irreversible pulpitis with acute apical periodontitis, moderate or severe preoperative symptoms. As this is a non infected condition with the vital pulp and without systemic involvement, thus this condition does not necessitate the prescription of antibiotics, only the removal of cause and prescription of the analgesics, when indicated will suffice for this Condition. But in the present study 42% of the respondents have prescribed the antibiotics for this condition which is totally unjustified for this condition and the scientific guidelines for antibiotics prescription are totally neglected. The same unjustified and unnecessary antibiotic prescription for this condition is found in the previous studies in a range of 30% -71 % [13,15,16].

The fifth endodontic condition of this survey was necrotic pulp, with chronic apical periodontitis, no swelling and no or mild preoperative symptoms. Although there is no clear cut indication for the prescription of antibiotic but even then 23.5% of the respondents have prescribed the antibiotics for this condition where as in similar survey based studies the Spanish dentists and Indian dentists prescribed antibiotics for this condition only 14.3% and 38.2% respectively [14,15]. Similarly a higher percentage of the responding dentists in surveys done in USA, prescribed the antibiotics for similar condition [14,16]. Again, this is an unjustified and unnecessary antibiotic prescription because the justified treatment for this condition is the removal of the cause by nonsurgical endodontic treatment.

The sixth endodontic condition of this survey was irreversible pulpitis with moderate/severe preoperative symptoms. In this condition the pulp is vital and there are no signs and symptoms of systemic involvement so there is no indication for the prescription of antibiotics in this condition [17]. In the present study 27.3% of the

Responding dentists prescribed antibiotics for this condition which is totally unjustified and unnecessary. This finding in the present study showed that the scientific basis for the prescription of antibiotics in the present condition is neglected by a large percentage of the responding dentists. In the previous surveys done in Spain, India and US 31% and 37.6% of the responding dentists respectively prescribed the antibiotics for this condition, which are comparable with our study [14,15].

In the present study, [Table/Fig-3] shows the percentages of various types of antibiotics which have been prescribed by responding dentists. Amoxicillin and clavulanic acid in combination is considered as a combination of choice for odontogenic infection because this combination has the broad antimicrobial spectrum and low incidence of bacterial resistance [18]. In the present survey the drug which was most prescribed by the responding dentists was amoxicillin and clavulanic acid combination 45.2 % followed by amoxicillin alone 33.7% and amoxicillin and metronidazole combination 15%. In a survey done by Spanish dentists amoxicillin in combination with calvulanic acid was prescribed by 61% of the respondents followed by amoxicillin. In 2007 the antibiotic treatment which has been prescribed by the Spanish dentists was amoxicillin and clavulanic acid, followed by amoxicillin alone [19]. Amoxicillin was a principal antimicrobial agent in the European countries [20]. Amoxicillin being broad spectrum is a drug of choice to treat the odontogenic infection, but it may cause antibiotic resistance [21]. In Contrast in the USA amoxicillin was prescribed only by 27.5% of members of AAE [14,16]. In the present survey, metronidazole was prescribed by the respondents as Falgyal and only a small percentage of the responding dentists prescribed it (5.7%). Metronidazole is very effective antimicrobial agent against obligate anaerobes but not as effective against facultative anaerobes. Therefore, when amoxicillin alone is not effective after 2-3 days of use then metronidazole should be recommended as a supplemental medication to increase the efficacy of amoxicillin [21]. Metronidazole is an effective antimicrobial agent against anaerobes but it has no activity against the aerobes and therefore metronidazole is required to be used in combination with other antimicrobial agent to be effective against odontogenic infections [22]. In the present survey the metronidazole was prescribed in combination with amoxicillin by 15% of the responding dentists and it was the third most commonly prescribed combination in our study. In a survey done by Spanish dentists, metronidazole was prescribed in combination with spiramycin by 23% of the endodontists [14,19]. The antibiotics should be used judiciously for well defined indications in the endodontics. The antibiotics use should only be considered as an adjunct to the non surgical endodontic therapy or in those cases where emergency treatment is not possible due to the busy schedule of the dentists [8,23]. At the end the dentists should have a sound knowledge about the endodontic indications for the prescription of antibiotic to restrict and prevent the misuse and overuse of antibiotics thus helping in the control of this global problem [24].

CONCLUSION

It is concluded from the present study that the dentists should know the scientific basis for the prescription of antibiotics during endodontic therapy. They should follow and should not neglect the current guidelines for antibiotic prescriptions. There should be community awareness programmes for the dentists about the global problems of misuse of antibiotics and antibiotic resistance so that they can play a role in controlling these global problems.

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