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Original Research

Trends in Prescribing Antibiotics among Dental Surgeons for Pulpal and Periapical Pathologies

Kumar Pushpanshu¹, Rachna Kaushik^{2*}

¹ MDS, Associate Professor & Head, Department of Dentistry, Sri Krishna Medical College & Hospital, Muzaffarpur, India,

² MDS, Associate professor and Head, Department of Dentistry, Government Medical College, Bettiah, Bihar, India

ABSTRACT

Aim: To analyze the trends in prescribing antibiotics for pulpal and periapical pathology among dentists in Muzaffarpur, a city in eastern India. **Methodology:** A total of 212 questionnaires were distributed to the dentists practising in and around the city. Demographic details and questions regarding choice and dosage of antibiotics prescribed were recorded. Statistical analyses were performed, and $P < 0.05$ was considered statistically significant. **Results:** A total of 188 (88.75%) dentists responded. All the respondents regularly prescribed antibiotics for endodontic management. The first choice antibiotic was a combination of amoxicillin and clavulanic acid (48.9%), followed by a combination of ofloxacin and ornidazole (16.5%). 13.8% preferred a combination of cefixime and clavulanic acid. In case of allergy to penicillin, erythromycin was the antibiotic of choice. **Conclusion:** The present study highlights that the antibiotic abuse by the dentists is quite prevalent in this region. The authors suggest educating and encouraging the dentists for prescribing the antibiotics judiciously.

KEY WORDS: Antibiotics, Periapical Pathologies, Pulpal pathologies.

Corresponding author: Dr. Rachna Kaushik, MDS, Associate professor and Head, Department of Dentistry, Government Medical College, Bettiah, Bihar, India

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INTRODUCTION

The discovery of antibiotics is one of the greatest boons for mankind. The oral cavity is a complex ecosystem and orofacial infections are caused by a wide variety of microorganisms.^[1] The infection of the oral cavity is a common public health problem and constant cause for antibiotic prescription. It is the most frequent reason for seeking odontological consultation and intervention and it affects the entire population from childhood (especially cavities) throughout a person's entire lifespan. Thus, antibiotics and analgesics account for a vast majority of medicines prescribed by the dentists. However, there has been a rise in bacterial resistance observed over the last few years, which may be due to overprescription by health care providers and improper use by patients.^[2] In endodontics, despite the fact that antibiotics should be used only as an adjunct to definitive therapy, they are prescribed on a regular basis^[3-8]. The main objective of this document is to analyze the trends in prescribing antibiotics for pulpal and periapical pathology

among dentists in Muzaffarpur, and hence to establish useful recommendations for all of those involved in the clinical management of this pathology.

MATERIALS AND METHOD

A cross-sectional study was designed and a total of 188 questionnaires were distributed to the dentists practising in and around Muzaffarpur. Demographic details and questions regarding choice and dosage of antibiotics prescribed were recorded. Data were coded, entered in a spreadsheet application and analyzed using the SPSS version 14.0. A P-value of < 0.05 was considered significant.

RESULTS

Of the 212 questionnaires distributed, 188 dentists actively participated in the survey (response rate: 88.7%). Table 1 indicates

demographic details of the dental practitioners (age, gender, educational qualification). A majority were young dentists < 35 years of age [108(57.4%)]. Female dentists were outnumbered by their male counterparts (70.7%). 83.5% of the respondents possessed bachelor’s degree (Bachelor of Dental Surgery—BDS) and rest Master of Dental Surgery—MDS. The most preferred antibiotic happened to be amoxicillin and clavulanic acid combination (48.9%), followed by a combination of ofloxacin and ornidazole (16.5%) (Table2). Around 57.4% of this study population prescribed antibiotics for a duration of five days, 24.5% for 3 days and 18.1% prescribed it for 7 days. A statistically significant difference was noted when comparison of academic qualification ($P = 0.03$) and age groups ($P = 0.05$) with the number of days of antibiotic prescription was done with more of MDS practitioners and elder age group recommending for seven days. In patients allergic to penicillin, erythromycin (44.7%) was the first choice antibiotic followed by Cefixime + clavulanic acid combination (Table 3).

Table 1: Demographic details of the participating dentists

Variable	Gender	
	Male n (%)	Female n (%)
Total n (%)		
Age group		
<35 yrs	78(72.2%)	30(27.8%)
108(57.4%)		
35–50yrs	44(67.7%)	21(32.3%)
65(34.6%)		
>50yrs	11(73.3%)	4(26.7%)
15(7.9%)		
Total	133 (70.7%)	55(29.3%)
188 (100%)		
Academic Qualification		
BDS	112(71.3%)	45(28.6%)
157(83.5%)		
MDS	21(67.7%)	10(32.3%)
31(16.5%)		
Total	133 (70.7%)	55(29.3%)
188(100%)		

Table 2: First choice antibiotic for adult patient

Antibiotic	Total n (%)
Amoxicillin + clavulanic acid 625mg	92 (48.9%)
Ofloxacin 200mg + ornidazole 500mg	31 (16.5%)
Cefixime200mg + clavulanic acid 125mg	26 (13.8%)
Amoxicillin 500mg + metronidazole 400mg	20 (10.6%)
Amoxicillin 500mg	11(5.9%)
Others	8 (4.2%)
Grand total	188 (100%)

Table 3: First choice antibiotic for adult patient allergic to Penicillin

Antibiotic	Total n (%)
Erythromycin 500mg	84 (44.7%)
Cefixime200mg + clavulanic acid 125mg	51 (27.1%)
Clindamycin 300mg	22 (11.7%)
Metronidazole 400mg	19 (10.1%)
Ciprofloxacin 500mg+tinidazole 600mg	12 (6.4%)
Grand total	188 (100%)

DISCUSSION

Eighty-nine per cent of the questionnaires returned were completed. To encourage cooperation with data collection, the questionnaire was designed to be brief and easy to complete. The study investigated the prescribing of antibiotics for pulpal and periapical pathology in Muzaffarpur. The authors acknowledge that the results may not be a representative sample of the whole country. The trends of prescribing could be affected by differences in service condition and the type of dental emergency presenting. Nevertheless the results confirm that in general dental practice the fundamental principles in antibiotic prescribing are being ignored and antibiotics are being inappropriately prescribed. Surprisingly 100% dentists prescribed antibiotics as the majority of the patients presented complaining of pain. However, pulpitis is an inflammatory condition and local treatment only could have removed and relieved the pain and infection [9]. The treatment of odontogenic infections is based on two fundamental elements: mechanical-surgical management and antibiotherapy. These antibiotics should only be used as an adjunct to the management of acute dentoalveolar abscess and not treatment. In fact in local infection and the use of antibiotics as a treatment option was not entirely appropriate. In case of cellulitic infection (presence of a diffuse swelling, increased temperature, malaise and lymphadenitis) systemic antibiotics are required. However, majority of the dentists reported to have prescribed antibiotics without drainage [10, 11].The infection of the oral cavity is a common public health problem and constant cause for antibiotic prescription. In recent years, antibiotics abuse has been high in India, which cannot be justified by a higher prevalence of infections in this country. There is a tendency to prescribe antibiotics for any infection, regardless of its etiology [12]. Antibiotics are an important treatment option and are of therapeutic benefit to the patient, when clinically indicated. However they should be used with restraint because of the possibility of allergic reactions, toxicity, side effects and the development of resistant strains of microbes [13]. Systematic administration of antibiotics to prevent local infections in fit patients is much more controversial. The most common antibiotic prescribed was amoxicillin in combination with clavulanic acid, followed by a combination of ofloxacin and ornidazole. Both have been supported for their use in treating a dental abscess by microbiological and clinical findings [14, 15].Dentist use of antibiotics is characterized by a number of particularities. In effect, antibiotic prescription is empirical, i.e., the clinician does not exactly know what microorganism is responsible for the infection, since pus or exudate cultures are not commonly made. Based on clinical and bacterial epidemiological data, the germs responsible for the infectious process are suspected, and treatment is decided on a presumptive basis, fundamented on probabilistic reasoning. As a result of the above, broad spectrum antibiotics are typically prescribed, which may be inappropriate and promote the development of bacterial resistance. Another important factor causing the resistance to appear is lack of therapeutic compliance, specially what regards dosage and treatment duration. Thus an increased number of bacterial strains resistant to conventional antibiotics are found in the oral cavity [16].We tried to figure out as to why the practitioners prescribed inappropriately. Firstly, they may have a poor understanding of the pathological processes involved in pulp and periapical diseases. Furthermore, there could be a lack of knowledge of the indications for effective antibiotic use. A second explanation is that attitudes to prescribing could be

modified by the effects of the local environment. The dentists try to alleviate the symptoms before anything else, thus prescribing the drugs even without a proper diagnosis. What then should be done? Qualitative research is required to see if we can find out directly from practitioners why this problem of inappropriate antibiotic prescribing is so intractable. Methods also need to be developed to educate the practitioners, and enable them to change their prescribing behaviour. Finally, in our opinion it would be a good initiative to develop a clinical practice guideline to unify criteria and achieve maximum effectiveness in the treatment of odontogenic infections.

CONCLUSION

The majority of the patients had pain associated with a localised infection with only a minority showing signs of a possible spreading infection. All the patients with pulpitis were prescribed antibiotics with/without surgical intervention. This study lends support to the hypothesis that antibiotics are being inappropriately prescribed by the dental professionals of Muzaffarpur. Continuing dental education programmes should be carried out to educate the practitioners and to establish useful recommendations for all of those involved in the clinical management of this pathology.

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