

Antibiotics prescribing habits: an evaluation of dental practitioners in Manipur, North east India

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ABSTRACT

Background: Dental practitioners need to be thoroughly aware of the clinical indications for antibiotic prescription in order to prevent the insult of these medicaments. The aim of this study was to determine the pattern of antibiotic prescriptions among oral healthcare providers in Manipur, North East India. Multitude of studies has been conducted in various parts of the world and in India however, this is the first in the North east region of India and in Manipur.

Methods: It was a questionnaire based study with the inclusion of types, dosage, clinical situations and medical situations when antibiotics were prescribed by active dental practitioners.

Results: Antibiotic most commonly prescribed among individuals with no medical allergies was amoxicillin + clavulanic acid. 625 mg (72%) while in case of allergy azithromycin (48%) was the preferred choice. Antibiotics were prescribed in a vast majority of acute and chronic conditions. The analysis of the clinical scenarios for therapeutic prescriptions by dentists also proved to be considerably high and unnecessary.

Conclusions: The present study determined that the pattern of antibiotic prescription among oral healthcare providers in Manipur, North east India was extremely high.

Keywords: Antibiotics, Prescription pattern, Dental practitioners, North East India, Manipur

INTRODUCTION

The pharmaceutical industry in India is the world's third-largest in terms of volume.¹ Globally, India ranks 3rd in terms of volume and 14th in terms of value.² According

to department of pharmaceuticals, Ministry of chemicals and fertilizers, the total turnover of India's pharmaceuticals industry between 2008 and September 2009 was US \$21.04 billion. The domestic market is worth US \$13.8 billion as of 2013, and is expected to

reach US \$49 billion by 2020.³ Dentists prescribe medications for the management of a number of oral conditions, mainly orofacial infections.⁴ Majority of the dental infections are polymicrobial in nature, thus clinicians generally prescribe a vast variety of antimicrobial agents.⁵ Dentists in primary care account for approximately one in ten of all therapeutic antibiotic prescriptions, but many of these prescriptions may be unnecessary and will contribute to the critically important problem of bacterial resistance.⁶ Antibiotics are considered as safe drugs as they have no direct effect on the host, only attacking the bacterial microflora. The development of resistance is not only a problem with the target bacteria in the condition being treated with antibiotics, other organisms within the body are also affected.⁷ The last decade has seen the emergence of multi-resistant bacteria or 'superbugs' which do not respond to any antibiotic.⁸ Thus, in just over half a century, there is a possibility of a return to the pre-antibiotic era, when infections were a leading cause of death and disease. This apparent safety has engendered an attitude of prescribing antibiotics for a wide variety of conditions 'just in case' of infection and patients often expect antibiotic prescription. There is increasing evidence that this attitude is totally inappropriate.⁹

METHODS

A total of 122 questionnaire was distributed to all the dentist registered with IDA Manipur state branch, India out of which 100 questionnaires was received completely filled. The questionnaire given to the participants was designed to assess the following demographic data of the participants; pattern of prescribing antibiotics, clinical scenarios for therapeutic prescriptions and questions on indications for prophylactic usage. It also included the various diagnoses which the dental practitioners usually come across in the day to day practice for which they may prescribe the antibiotics. Another part of the questionnaire included the various medical conditions for which the doctor is likely to prescribe the antibiotics. And lastly it focused on the various high and low risk procedures where there is a likelihood of the prescription. The collected data was interpreted through statistical analysis by using SPSS version 23 software.

RESULTS

A total of 100 practicing dentists participated in the present study. Majority of the dentist undertaking the study belonged to the age group of 26-30 years (Figure 1).

The average practicing time frame of dentists is shown in Figure 2 suggesting a vast majority between 1-5 years.

The percentage of the preferred antibiotics prescribed by the dentists in case of no allergy to penicillin and those allergic to penicillin have been highlighted in Table 1 and 2.

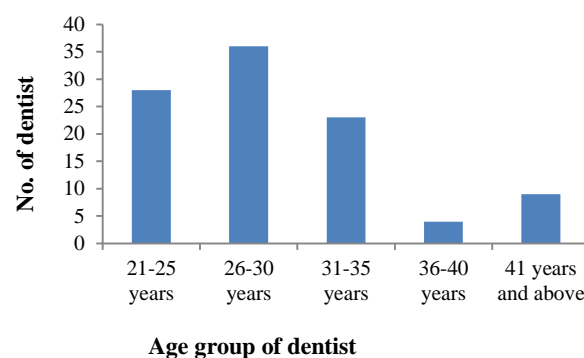


Figure 1: Age distribution of the dentist.

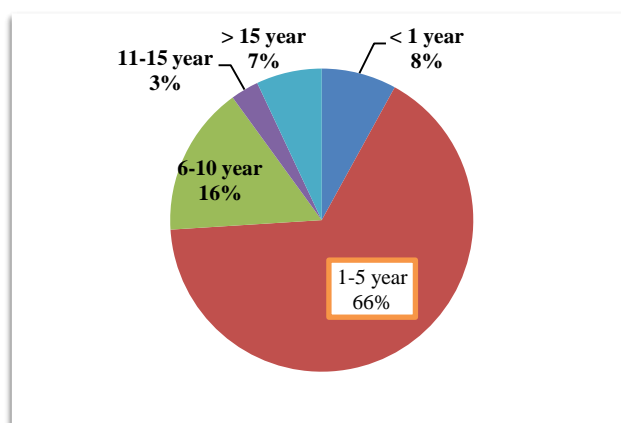


Figure 2: Practicing time frame of dentist.

Table 1: Percentage of antibiotics prescribed by dentist.

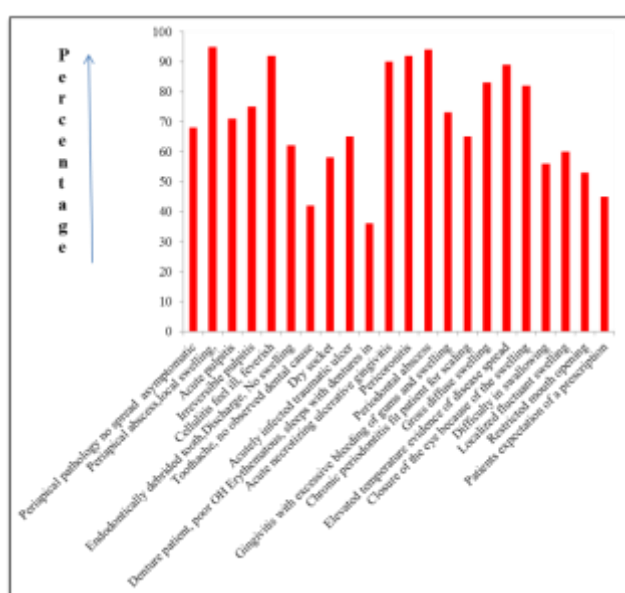
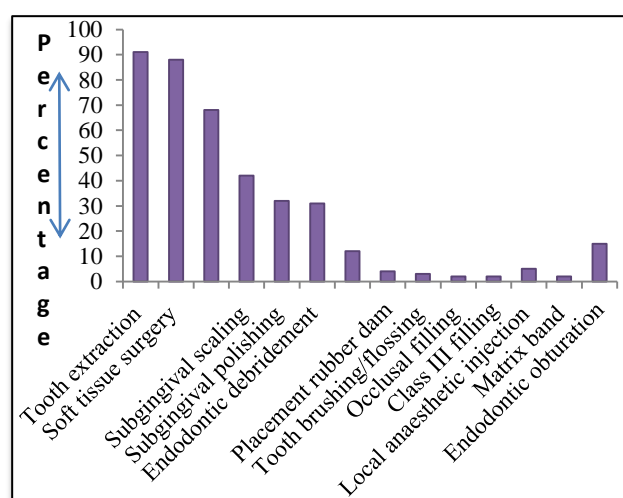
Preferred antibiotic	Percentage (%)
Amoxicillin + clavulanic acid 625 mg	72 %
Amoxycillin 500 mg	21%
Cefadroxil 500 mg	3 %
Ofloxacin 200 mg + ornidazole 500 mg	2 %
Ciprofloxacin 500 mg + tinidazole 300 mg	1 %

This study also showed that antibiotics were prescribed for a large number of medical conditions out of which previous history of bacterial endocarditis scored the highest of 93% followed by prosthetic heart valve 69%. Majority of the conditions included in the questionnaire scored between 40-60% such as atrial septal defect, mitral valve incompetence, immune-suppressed patient etc. Few conditions such as pregnancy, carcinoma of large intestine and stroke ranged between 20-30%.

It was observed that antibiotics were prescribed in a vast majority of acute and chronic conditions. The highest percentages were seen in periapical abscess (95%) and periodontal abscess (94%) both of which were acute conditions (Figure 3).

Table 2: Preferred choice of antibiotic in case of allergy.

Preferred antibiotic	Percentage (%)
Azithromycin	48
Cefixime 200 mg	19
Cefadroxil 500 mg	12
Ciprofloxacin 200mg	5
Ofloxacin 200mg + ornidazole 500mg	5
Erythromycin 500mg	4
Ciprofloxacin 500mg	3
Ciprofloxacin 500mg + tinidazole 600mg	3
Cephalexin 500mg	1

**Figure 3: Antibiotics prescribed during various acute and chronic conditions.****Figure 4: Antibiotics prescribed during different dental procedures.**

DISCUSSION

Dentistry is a specialized branch and almost all the problems can be managed by operative intervention of the infected area and oral hygiene measures with antimicrobial therapy acting as an adjuvant. Literature shows evidence indicating inadequate antibiotic prescribing practices manifested by over-prescribing.¹¹ Multitude of studies have been conducted in various parts of the world and in India but this is the first study to be conducted in the North east region of India and in Manipur, India. Various guidelines recommend that the first step in the treatment of dental and periodontal infections is the use of local measures. Antibiotics are appropriate for oral infections where there is evidence of spreading infection or systemic involvement. In addition, other indications for antibiotics are acute necrotising ulcerative gingivitis and sinusitis, and pericoronitis where there is systemic involvement or persistent swelling despite local treatment. Antibiotics should be used in conjunction with, and not as an alternative to, local measures. There is no evidence to support the prescription of antibiotics for the treatment of pulpitis or the prevention of dry socket in non-immuno compromised patients undergoing non- surgical dental extractions.¹² The current study showed that majority of the dentists (82%) prescribed antibiotics on a daily basis which interprets that there was a definite tendency towards over prescription of the drugs. Amoxicillin along with clavulanic acid (72%) was the drug of choice for patients not being allergic to penicillin followed by amoxicillin 500mg (21%). Similar results were obtained in other studies in India as well as western countries.^{10,13,14} A vast majority of the practitioners prescribed azithromycin 500mg (48%) followed by cefixime 200mg (19%) and cefadroxil 500mg (12%) among patients allergic to penicillin. Considering the protocol advocated by the antibiotic prescribing guidelines 2013, this seems inappropriate. The reason for this pattern of prescribing such strong antibiotics may be because of improperly sterilized equipment; thus, a just in case "principle is practiced or due to the influence of different pharmaceutical companies promoting their products.¹⁵⁻¹⁷ In the present study a vast variety of dental situations both acute and chronic were included and evaluated such as chronic periapical pathology without any spread and symptoms, chronic periodontitis, acute conditions like periapical abscess, acute pulpitis, cellulitis, dry socket, etc. It was observed that more than 50% of the practitioners prescribed antibiotics for all the conditions. It was also observed that 45% of the dentists just prescribed antibiotics for the expectation of the patient. This is completely in contradiction with the guidelines prescribed by the national institute for health and clinical excellence (NICE).¹⁸ It was also unjustified to prescribe antibiotics for localized/ diffuse infections as removal of the etiology and/or providing drainage would usually lead to a complete resolution of the problem.¹⁵

Various medical conditions requiring dental treatment was also evaluated and the results showed that approx. 40% and more of the dentists prescribed antibiotics to every patient having a history or currently being systemically unhealthy except the condition of pregnancy where the antibiotic prescription decreased to 25%. As a matter of fact a maximum of 93% of the dentists prescribed antibiotics in patients who have a history of bacterial endocarditis. This was completely not in accordance with the guidelines provided by NICE. This is a mere proof of the ignorance and inadequate knowledge of the dentists.

Antibiotic coverage before and after all periodontal treatment procedures (including probing) require antibiotic prophylaxis in patients at risk for infective endocarditis.¹⁹ A healthy individual normally does not require antibiotic coverage for any of the minor procedures such as subgingival scaling, polishing or even atraumatic extractions.²⁰

However a vast majority of the doctors prescribe the antibiotics for such minor procedures and 91% of the dentists prescribe antibiotics for extractions under normal conditions. It was expected that higher education would result in better antibiotic prescription pattern, but in this study it was not applicable to most of the questions.

CONCLUSION

The present study determined that the pattern of antibiotic prescription among oral healthcare providers in Manipur, North east India was extremely high. It also assessed the knowledge of antimicrobial drugs of the dentists. The analysis of the clinical scenarios for therapeutic prescriptions by dentists also proved to be considerably high and unnecessary. Further, the evaluation of the awareness of dentists regarding drug resistance in Manipur was surveyed in this study. However, there were many limitations of this study. This includes the small sample size suggesting the need for more extensive data collection. The need for culture and sensitivity testing requirement by the dentist to the patient and also the reporting of adverse drug reactions by the dentists was lacking in the questionnaire. Thus a more extensive study is required to attain detailed results. To combat the problem of over prescription of antimicrobials by oral health practitioners, it is important to conduct regular continuing dental education (CDE) programs in this particular field along with active interactions with microbiologists.

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