

TRENDS OF ANTIBIOTIC PRESCRIBING IN DENTISTRY

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ABSTRACT

Objectives: The aim of this study was to study the antibiotic usage among dental health care practitioners. **Methodology:** The study was conducted for one month from August 2014 to September 2014. A selfstructured questionnaire was designed and personally delivered to all the registered and practising dental surgeons in Bapuji Dental College and Hospital (BDCH), College of Dental Sciences (CODS) and general dental practitioners of Davangere, Karnataka. Questions regarding the common antibiotics prescribed and the indications for which the antibiotics prescribed were included in the questionnaire. **Results:** Total of 69 dentists out of 110 responded to the questionnaires giving a response rate of 63%. 78% of the dentists had

been practising for less than five years. Among the various factors like cost, patient compliance, duration of course and dosage frequency specified in the questionnaire, nearly one third of the dentists considered patient compliance before prescribing antibiotics. Odontogenic infections such as periapical space infection and infective ulcers, traumatic extraction and abscess were the common conditions for which antibiotics were prescribed. Amoxycillin followed by metronidazole and combination of amoxycillin with clavulanic acid were the commonly preferred antibiotics. Only 6% of the dentists advised culture and sensitivity tests frequently. **Conclusion:** Amoxycillin, metronidazole and combination of amoxycillin with clavulanic acid were the most common antibiotics used for the management of oral diseases. Patient compliance is an important factor considered by the dentists when prescribing.

KEYWORDS: Antibiotics, Dental, Amoxycillin.

INTRODUCTION

In 1928, Alexander Fleming.^[1] a Scottish Bacteriologist, noticed that *Penicillium rubens*^[2] mold contaminated and seemed to have killed *Staphylococcus aureus* which was kept for culture in dish. This mold of *penicillium* that contaminated was later discovered to possess powerful antibiotic penicillin that turned out to be the discovery of this millennium; thus the era of antibiotics begin. Since decades antimicrobial prescription in dental practice has become a major intervention in tackling many dental conditions,^[3] such as odontogenic infections, non odontogenic infections and even prophylaxis taken for local infection and prior to surgical interventions.

Narrow spectrum antibiotics are to be considered as the first choice.^[3] because of less side effects and also due to increasing incidence of bacterial resistance, hence judicious use of antibiotics in dental surgical procedures is required.

But Prescription of wide spectrum antibiotics like cephalosporins,^[4] fluoroquinolones.^[4, 5] by many dentists to combat milder infections has become a trend in the general practice which has lead to development of resistance by most of the bacteria's to the presently available antimicrobials.

After the discovery^[6] of New Delhi metallo-beta-lactamase (NDM-1) enzyme in *Klebsiella pneumoniae*, which is resistant to most of the available antibiotics and could rapidly spread worldwide and for which new and effective antibiotics are currently not available; now the question rises whether the era of untreatable infections has arrived and we fear that we may shortly run out of antibiotics.

In addition to resistance, prescribing antibiotics are not always beneficial and they may be associated with certain adverse effects, that can range from mild to moderate (like gastrointestinal disturbance) or at times life threatening like anaphylactic shock.^[7,8,9] On the other hand practitioner are sometimes forced to prescribe antibiotics on non clinical basis,^[4] just to meet the demand and expectations of the patients.

Hence the choice.^[10] of when and which antibiotic to prescribe leaves room for misuse and therefore it is essential to continuously monitor knowledge and pattern of prescription. So the prime importance of the practitioner is to follow standard protocol in prescribing antibiotics based on the course of illness and the susceptibility pattern in that geographical area.

Sufficient literature of antibiotic prescribing by general dental practitioner is lacking in India. So the aim of this study is to determine the trends of antibiotic use among dental health care practitioners

METHODOLOGY

The study was conducted among the registered dental health care practitioners ($n \geq 100$) working in Bapuji Dental College, College of Dental Science and registered dental healthcare practitioners of Davangere. Only those dental practitioners who were ready to participate in the study were enrolled.

The study was conducted for two months, in the months of August 2014 and September 2014.

A structured questionnaire was designed, pre-tested and was physically delivered to all the registered and practicing dental doctors in Bapuji Dental College and Hospital (BDCH), College of Dental Sciences (CODS) and general dental practitioners of Davangere.

The questionnaire included socio-demographic factors that will elicit response regarding patients influence on antibiotic prescription; collection of appropriate sample for culture and sensitivity before prescription of antibiotic, most commonly preferred antibiotics of choice for common indications and antibiotics if used for prophylaxis. The information was kept classified by removing all the possible personal identifiers.

After questionnaire completion; the collected data was evaluated, organized and explicated as counts and percentages.

RESULTS

A total of 69 dentists out of 110 responded to the questionnaire giving a response rate of 63 percent. 59% of the respondents were female. 78% of the responded dentists had been practicing for less than five years.

Among the various factors like cost, patient compliance, duration of course and dosage frequency specified in the questionnaire, nearly one third of the dentists considered patient compliance(30%) before prescribing antibiotics (Figure 1). Only 6% of the dentists advised culture and sensitivity tests frequently [Figure 2].

Also dentists preferred prescribing antibiotics in abscess-16.3% (Periapical, periodontal abscess), after Traumatic Extractions-14% and other oral conditions (both acute and chronic - like periapical space infection, infective ulcers, periodontitis, infective periapical cyst, etc) [Figure3].

Amoxycillin, metronidazole and combination of amoxycillin and clavulanic acid were the antibiotics preferred for most of indications specified by the dentists; in which Amoxycillin and metronidazole were commonly preferred after traumatic extractions, whereas amoxicillin with clavulanic acid was commonly preferred for the treatment of abscess. Other antibiotics that were preferred were: Macrolides (azithromycin), fluoroquinolones (ciprofloxacin, ofloxacin), cephalosporins (ceftriaxone) [Figure 4]. Approximately 15% of dentists preferred prescribing antibiotics for prophylaxis before any procedures and amoxycillin was the common choice as prophylactic antibiotic.

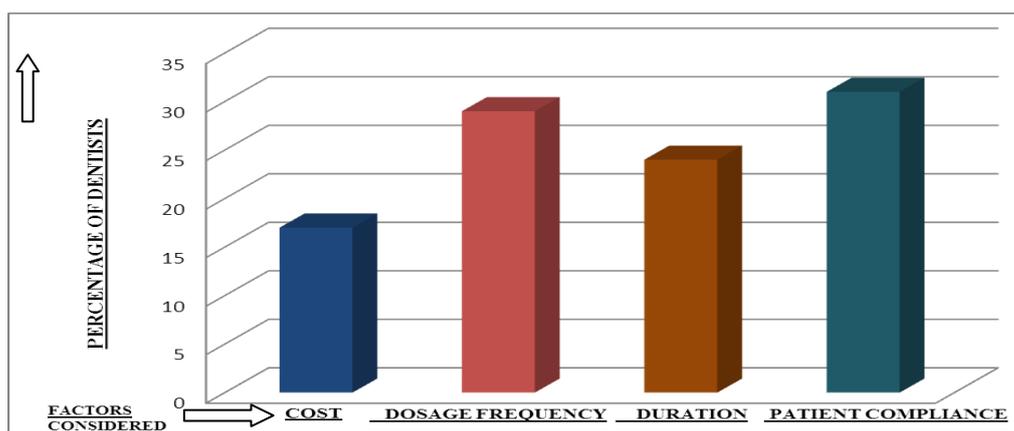


FIGURE 1: Factors considered by dentists before prescribing antibiotics

Cost – 17%, Dosage frequency – 29%, Duration: 24%, Patient compliance: 30%.

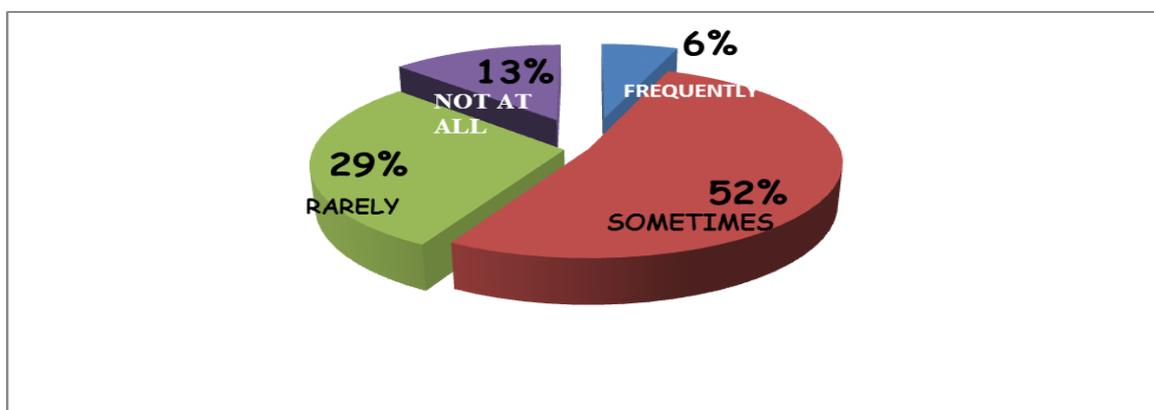


FIGURE 2: Frequency of culture and sensitivity(c/s) test consideration before antibiotic prescription

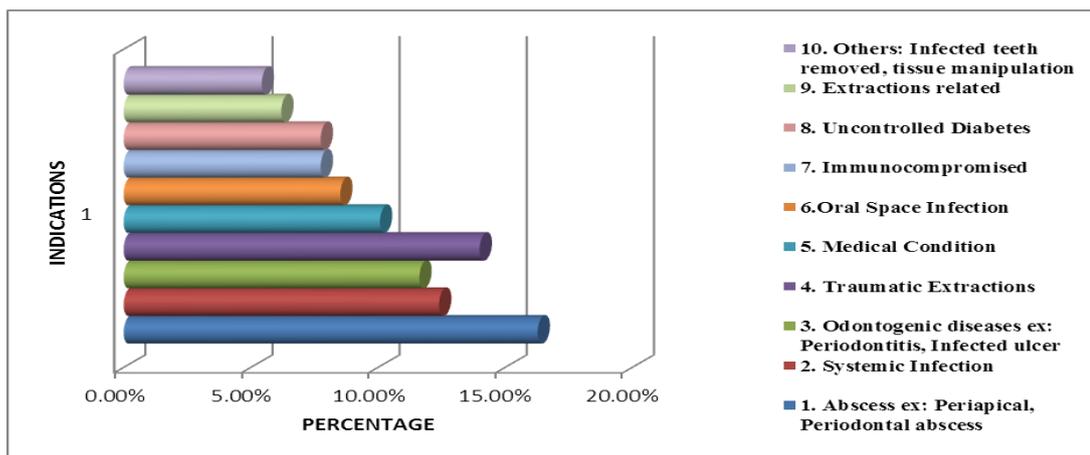


FIGURE 3: Common Indications where dentists prescribe antibiotics.

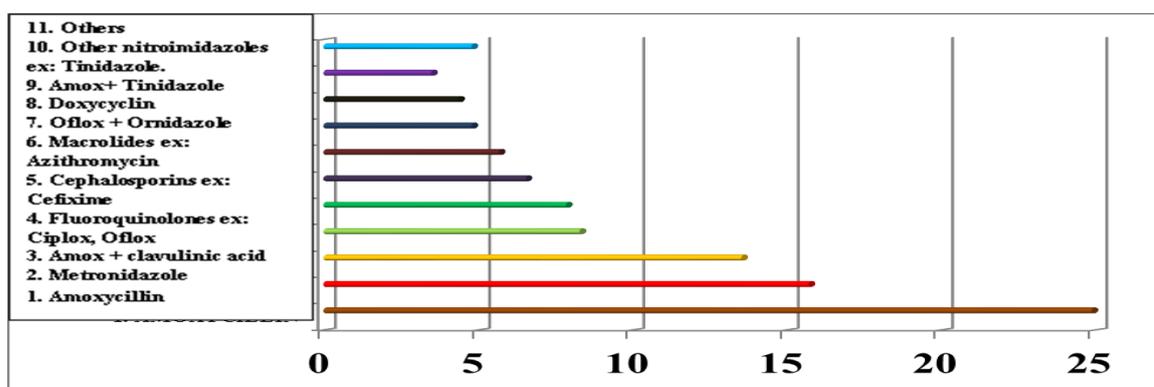


FIGURE 4: Various antibiotics preferred by dentists

DISCUSSION

In dentistry, the indication for using antibiotics are limited,^[11] as it has been observed that most dental diseases are best controlled by operative measures and by improving oral hygiene. Also it is advised to start antibiotics for oral infections with signs of spreading infection or if there is systemic involvement.^[11] In our present study we observed that only 12% of dentists preferred to prescribe antibiotics if there were signs of systemic infections.

In present study the response rate of dentist was 63% which was closely comparable to another study conducted by Palmer.^[9] et al(60.4%) in England. More than 40% of dentists preferred prescribing antibiotics in case of presence of oral diseases (including odontogenic infections and abscess). Also amoxicillin was the most preferred antibiotic for prescribing among dentists, which is similar to findings in studies conducted by Kamulegeya.^[10] et al in Uganda, Salako NO.^[12] et.al and Al- Maslamani MJ.^[13] et.al in Kuwait.

Bahl R,^[14] et al in their study inferred that odontogenic infections (like abscess of submandibular space, Pterygomandibular and sublingual space) were mixed aerobic and anaerobic infections. Hence they suggested to perform aerobic along with anaerobic cultures to isolate all the pathogens and they also said that their successful management depends on altering the environment through decompression, removal of the etiologic factor and by selecting the proper antibiotic. The ideal antibiotic selection depends on definitive results of antibiotic sensitivity testing and if a pragmatical approach is taken for empirical selection then penicillin,^[15] should remain the drug of choice and management should change to other antibiotics only if the infection fails to respond suggesting that resistant organism is involved. In our study we found that most of dentists ask for culture and sensitivity{87%} only the frequency of employing the test varied. Also they have concluded that amoxycillin with clavulanic acid was the preferred empirical treatment employed by most of dentists for abscess management in their study which is similar to the empirical treatment employed in our study for abscess management.

American dental association {ADA} recommends^[16] antibiotic for prophylactic use for 2 patients groups: One with heart conditions patients who may predispose to infective endocarditis and others with prosthetic joints patients who are at a risk of developing infections at the site of prosthesis by hematogenous route. Hence the American heart association released guidelines^[17] with the input from ADA that antibiotics should not be routinely prescribed for patients as prophylactic for protection against infective endocarditis as the chance of adverse reactions are more compared to its benefits . Also there is additional factor of developing drug resistance bacteria. In our present study we found out that only 15% of dentist prescribe antibiotics for prophylaxis use and were prescribing it only if there were heart conditions or if they were predisposed to infective endocarditis thus adhering to the ADA guidelines.

CONCLUSION

Amoxycillin, metronidazole and combination of amoxycillin with clavulanic acid were the most common antibiotics used for the management of oral diseases with patient compliance being an important factor considered by the dentists when prescribing antibiotics.

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