

Use or Abuse? A Questionnaire Based Survey to Assess Knowledge, Attitude and Practice of Dentists Regarding Prescription of Antibiotics in Mumbai, Maharashtra

Shilp M Shah^{1*} Devanand Shetty² Arvind Shetty³ Suyog Dharmadhikari⁴

¹PG Student, Department of Periodontology and Implantology, DY Patil School of Dentistry, Navi Mumbai, Maharashtra, India.

²Professor and Head, Department of Periodontology and Implantology, DY Patil School of Dentistry, Navi Mumbai, Maharashtra, India.

³Professor, Department of Periodontology and Implantology, DY Patil School of Dentistry, Navi Mumbai, Maharashtra, India.

⁴Associate Professor, Department of Periodontology and Implantology, DY Patil School of Dentistry, Navi Mumbai, Maharashtra, India.

ABSTRACT

Background: Dental infections are caused by plethora of various microflora. Therefore, antibiotics have become an integral part of any dental treatment. In dental practice antibiotics have major role to play mainly after oral surgical, endodontic and periodontal procedures. However, resistance to antimicrobial has been a rising global problem and threat to public health due to injudicious use of antibiotics. Therefore, judicious and appropriate use of antibiotics is very important for safe and effective treatment.

Materials and Methods: A cross-sectional online survey which included post graduate students of various dental colleges and general practitioners from all over Mumbai was carried out by using structured questionnaire containing 15 questions. The survey was converted to Google form.

Results: Out of 306 responses obtained 70.2%(214) preferred to prescribe antibiotics for most of surgical dental treatments.

Conclusion: From the present survey it was concluded that there was 'ABUSE' rather than 'USE' of antibiotics by dentists in Mumbai.

Keywords: Antibiotics, Resistance, Knowledge, Awareness.

INTRODUCTION

Antibiotics has revolutionized health care by saving lives and preventing serious health complications.¹ They have gained increasing importance to control infections and to reduce the significance of infectious diseases.² The era of antibiotics started in when the Alexander Fleming reported antibacterial action of penicillium species in 1929. An antibiotic is a chemical produced by a microorganism that kills or inhibits the growth of another microorganism.³ Since dental infections are caused by variety of microorganisms it becomes imperative to use antibiotics in day-to-day dental practices. Antibiotics has been used as adjuncts to various

surgical dental treatments as well as sole treatment in various dental conditions. Dentists are said to prescribe between 7% and 11% of all common antibiotics (beta lactams, macrolides, tetracyclines, clindamycin, metronidazole)⁴

Unfortunately, in recent years the use of antibiotics has been accompanied by the rapid emergence of antimicrobial resistance.⁵ First observed in 1940, penicillin-resistant bacteria were overcome with the development of new antibiotics. The emergence of new multidrug-resistant bacteria, however, has escalated at an alarming rate.⁶ The increasing

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*Correspondence Dr. Shilp M Shah.

Department of Periodontology and Implantology, DY Patil School of Dentistry, Navi Mumbai, Maharashtra, India.

Email: dr.shilpshah@gmail.com

resistance problems of recent years are probably related to over- or mis-use of broad-spectrum agents such as cephalosporins and fluoroquinolones⁷. Some 40%–50% of the antibiotics prescribed worldwide are unnecessary⁸ Dentistry accounts for approximately 3%–11% of all antibiotic prescriptions.⁹ This is a significant contribution to antibiotic consumption and it is clinicians' responsibility to understand the impact of their therapeutic decisions beyond the chairside.¹⁰ Penicillin antibiotics are generally prescribed in dental practice. Amoxicillin, metronidazole and clavulanate are commonly used drugs by dentists.^{11,12} Antibiotic resistance has become one of the biggest threats to the successful treatment of infection. WHO and several international and national organisations are calling for immediate action to limit the further development and spread of resistant bacterial strain.¹³

Therefore the aim of the study was to assess the knowledge, attitude and practice of the dentists regarding prescription of antibiotics and to assess the level of awareness about current trends regarding antibiotic resistance.

MATERIALS AND METHODS

A cross sectional online questionnaire survey was carried out among post graduate students of various dental colleges and general practitioners from all over Mumbai. The survey comprised of total 15 questions. The survey was converted to google form and the link was sent through various social media platforms. The responses obtained were assessed based on the knowledge, attitude and practice towards prescribing antibiotics and the awareness regarding current trends on antibiotic resistance. The questionnaire also provided information on demographics (age, sex, qualification and experience).

The obtained data were statistically analyzed in the form of frequency and percentage and descriptive statistics were presented in the form of suitable tables, pie diagrams and graphs.

RESULTS

Total of 306 participants responded to our online survey and from the demographic data obtained 188(61.6%) males and 118(38.4%) females

responded amongst which majority 117(38.4%) of were dental practitioners with B.D.S degree with experience between 5-10 years (58.9%). The demographic data is depicted in [Table 1].

Table 1: Demographic Data.

CHARACTERISTICS	FREQUENCY	PERCENT
GENDER		
MALES	188	61.6
FEMALES	118	38.4
QUALIFICATION		
B.D.S	117	38.4
POST-GRADUATE STUDENT	113	37.1
M.D.S	76	24.5
YEARS OF EXPERIENCE		
<5 YEARS	71	23.2%
5-10 YEARS	180	58.9%
>10 YEARS	55	17.9%

From the responses obtained 280(91.4%) dentists were aware about guidelines on prescribing antibiotics in dentistry [Figure 1].

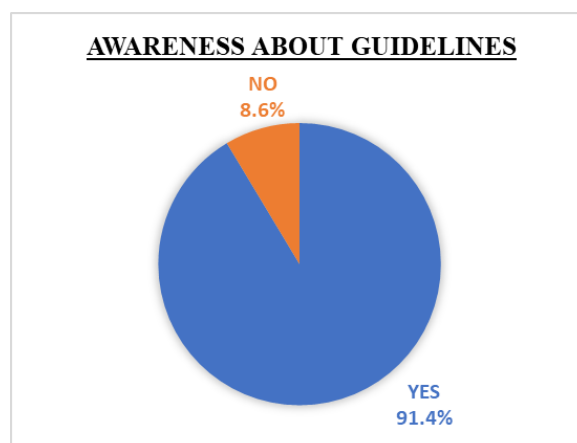


Fig 1: Awareness About Guidelines.

The responses regarding the prescription patterns and regimes showed that 70.2% (214) dentists preferred to prescribe antibiotics for most dental treatment mainly for surgical procedures [Figure 2] and most preferred antibiotic prescribed by dentists was Amoxicillin with Clavulanic acid 55.4%(170) followed by Amoxicillin 30.8%(94) and metronidazole 10.4%(32) and other antibiotics (azithromycin, clindamycin, doxycycline, ofloxacin, ciprofloxacin) which comprised total of 3.4%(10) [Figure 3]. Majority of the dentists preferred regime for 5 days 52.6%(161) whereas 40.5%(124) prefer

prescribing for 3 days and only 6.9%(21)
prescribed for 7 days [Figure 4].

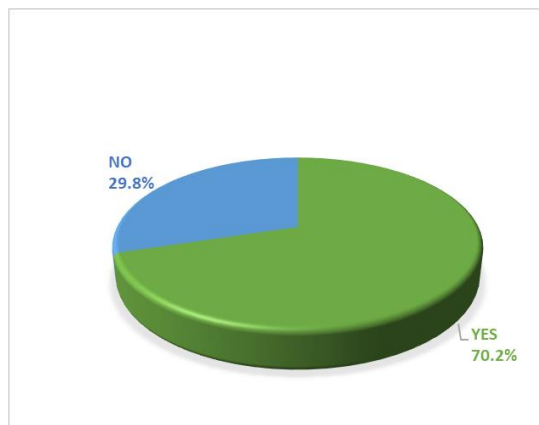


Fig 2: Preference for prescribing antibiotics.

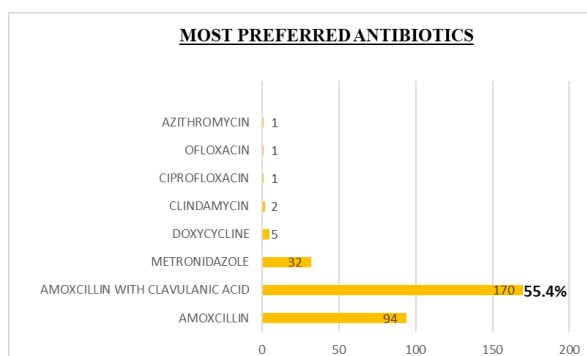


Fig 3: Most preferred antibiotics.

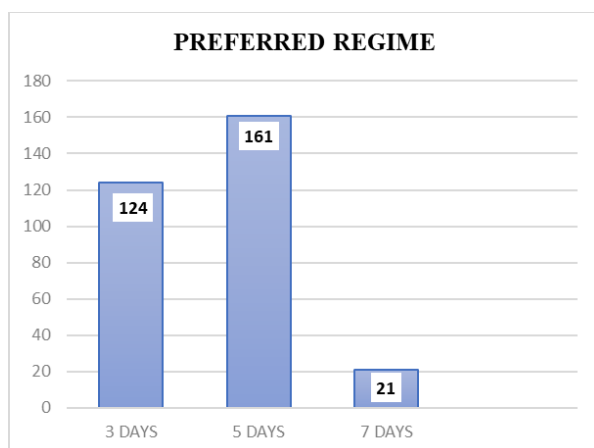


Fig 4: Preferred Regime.

A large number of the responses showed that dentists generally prescribe antibiotics for tooth extraction procedures 85.4%(261) [Figure 5] and the main reason which was given was to prevent post -operative complications 75.5%(231).[Figure 6].

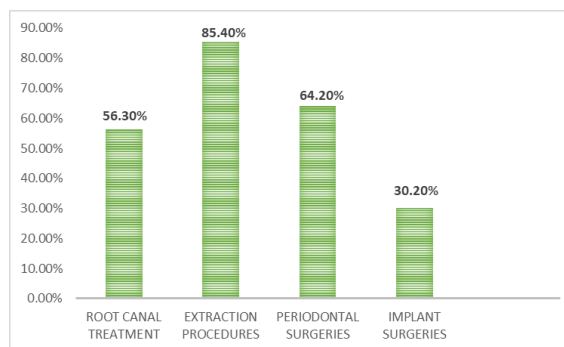


Fig 5: Treatments in which antibiotics are prescribed.

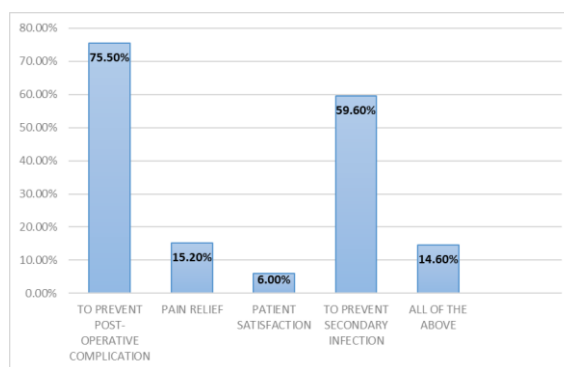


Fig 6: Reasons to prescribe antibiotics.

More than half of the dentists 58.7% (180) were in favour of prescribing antibiotics prophylactically and out of which the clinical conditions they usually preferred to give was in patients with infective endocarditis 95(53.4%) and in diabetic patients 60(33.4%) [Table 2].

Table 2: Responses regarding prescribing antibiotics prophylactically.

	FREQUENCY	PERCENT
RESPONSE		
NO	126	41.3
YES	180	58.7
CLINICAL CONDITIONS		
INFECTIVE ENDOCARDITIS	(95)	(53)
DIABETES	(60)	(33.4)
ABCESS	(25)	(14.6)

It was observed that 172 (56.3%) dentists had knowledge about antibiotic resistance and were updated with current statistics regarding same in India as well as globally [Figure 7].

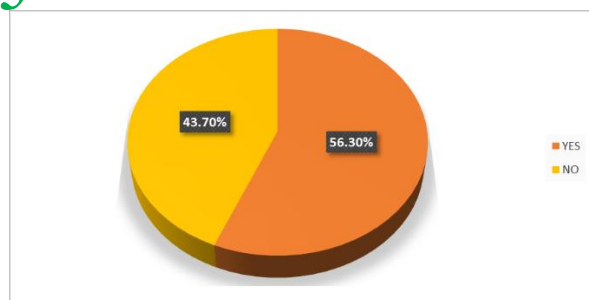


Fig 7: Knowledge about antibiotic resistance.

DISCUSSION

Antibiotic treatment is a part of pharmacotherapy with the quality of affording each etiological and curative action.¹⁴ Over prescription of antibiotics incorporates a negative impact on the patient's health and will cause the emergence of resistant microorganism strain. The excessive use of antibiotics is additionally a burden on the health-care system and economy of the country.¹⁵ The World Health Organisation (WHO) global action plan on antimicrobial resistance aims "to ensure, for as long as possible, continuity of successful treatment and prevention of infectious diseases with effective and safe medicines that are quality-assured, used in a responsible way, and accessible to all who need them."¹⁶ Around seventy to eighty percent of antibiotic prescriptions are unnecessarily prescribed by the health professionals.¹⁷

According to the CDC, "appropriate antibiotic prescribing means antibiotics are only prescribed when needed, and when needed, the right antibiotic is selected and prescribed at the right dose and for the right duration" and "appropriate antibiotic prescribing should be in accordance with evidence-based national and local clinical practice guidelines, when available."¹⁸

There are different guidelines provided in the field of dentistry. In Italy, according to the last version of Clinical Guidelines in Dentistry, published by the Ministry of Health in September 2017, the use of antibiotics is suggested for (1) Systemic side effects after paediatric oral surgery (2) Orthograde endodontic therapy, in order to control pain (3) Tooth replantation (4) Side effects of acute apical abscess (5) Antimicrobial therapy for severe periodontitis. According to the European Society of Endodontology, antibiotics can be administered in the following situations: acute apical abscess in

medically compromised patients, acute apical abscess with systemic involvement, progressive infections, replantation of avulsed permanent teeth, soft tissue trauma requiring treatment.²

A Report from the American Dental Association," advises against using antibiotics for most pulpal and periapical conditions and instead recommends only the use of dental treatment and, if needed, over-the-counter pain relievers such as acetaminophen or ibuprofen.¹⁹

Our online cross-sectional study was carried out to determine the nature of prescription patterns of antibiotics amongst dentists in Mumbai which included post graduate students of various dental colleges and general practitioners and also to get insight of their understanding about current status of antibiotic resistance and prevention for the same. A total of 306 dentists took part in our online cross sectional survey.

Tooth extraction procedures were most preferred procedures to prescribe antibiotics (85.4%) followed by periodontal surgeries (64.2%) and root canal procedures (56.3%). This was in accordance to the survey carried out by Sumit Mohan and Jyoti Thakur to assess prescription pattern of dentists in Eastern part of India in which showed more than 75% participants prescribed antibiotics following extractions.²⁰ A nationwide survey was carried out in Korea by Yoon-Young Choi²¹ regarding prescription of antibiotics after extraction which stated that the rate of prescription of antibiotics was 81.85%.

Our survey showed majority of the dentists (55.4%) first choice antibiotic was amoxicillin plus clavulanic acid followed by amoxicillin (30.8%) and metronidazole (10.8%) which was in agreement with retrospective study carried out by Ruza Bjelovucic et al²² in Croatia which showed amoxicillin group comprised of total of 82% of total prescriptions. A survey in Spain showed the leading antibiotic was amoxicillin plus clavulanic acid, followed by amoxicillin alone.²³ With the availability of a wide spectrum of drugs, it is important to make an informed decision of the best drug of choice based on the etiology of the disease. The use of antibiotics before extraction is deemed necessary only when there is a secondary systemic condition. Other conditions such as dry socket and periodontal

disease without any local spread of infection do not require a significant antibiotic prescription.²⁴ Hypersensitivity reactions are the major problem in the use of penicillins. In present study for patients with penicillin allergy most preferred antibiotic was Erythromycin (52.3%) followed by Doxycycline (30.7%) and other antibiotics included ofloxacin plus ornidazole (11.1%) and Clindamycin (5.3%). A similar results were obtained in study carried out by Pavan Kumar et al²⁵

The most preferred duration of the regime for prescription was found out to be 5 days (52.6%) in our study. Nowadays more preference is given to short course regimes. According to Rubenstein the drugs advocated for a short-course antibiotic therapy must have rapid onset of action, bactericidal activity, lack of propensity to induce resistant mutants, easy penetrability into tissues, activity against nondividing bacteria, not being affected by adverse infection conditions, administration at an optimal dose, and optimal dosing regimen.²⁶

The main reason for the prescription of antibiotics by study population was given as to prevent postoperative complications (75.5%) followed by secondary infection (59.6%) which can be suggestive of overuse of the drugs by the clinicians as many studies have concluded that antibiotics have no role to play in postoperative complications. It was observed that only 6% of clinicians gave antibiotics for reasons like for patient satisfaction which showed that they did not prescribe antibiotics for unscientific reasons which was supported by study done Salako et al²⁷

In our study 58.7% of the population prescribed drugs prophylactically and the majority of them prescribed for infective endocarditis patients. The guidelines provided by American Heart Association (AHA) and American College of Cardiology (ACC) 2017 states that prophylaxis is suitable for patients with certain heart conditions like Prosthetic cardiac valves, prosthetic material used for cardiac valve repair, previous Infective Endocarditis, congenital heart disease, and patients who had cardiac transplant with valve regurgitation²⁸

Surprisingly 21.9% of clinicians prescribed antibiotics for viral infection which showed increase in the indiscriminate use of the drugs which can

contribute to antibiotic resistance. Our study showed that 99.3% of the dentists took thorough past dental history of the patients before starting any treatment. About 98.6% the study population were aware about the side effects of the antibiotics prescribed and 82.6% had knowledge about generic medicines and accepted that generic medicines should be freely and readily available.

Antibiotic resistance is when bacteria no longer respond to antibiotics. According to the Centre for Disease Control and Prevention, at least 2 million people in the U.S. become infected with bacteria that are resistant to antibiotics and at least 23,000 people die each year as a direct result of these infections.²⁹ In our survey 56.3% of the study population were aware about the growing concern regarding antimicrobial resistance and were updated with current statistics for the same globally but still fairly large amount of the population 43.7% lacked knowledge about antimicrobial resistance which is matter of concern. 65.6% of the participants were updated with the new antibiotics and the most used source of information was found out was through the internet (56.6%).

CONCLUSION

Based on the responses obtained it was concluded that although there was adequate knowledge about growing concern of antibiotic resistance as well as recommended guidelines amongst most of dentists in Mumbai, they still prefer to prescribe antibiotics for most of the dental surgeries. There was "ABUSE" rather than "USE" of antibiotics as there were high prescription rates amongst dentists. This portrays that there is overprescription of the drugs which can contribute to antibiotic resistance. Therefore awareness programs need to be carried out to curb the indiscriminate use of the drugs and to follow the recommended guidelines. Educational intervention should be carried out on regular intervals at national as well as at global level regarding antibiotic resistance and its consequences.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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