

Antibiotic Prophylaxis Practice in Dentistry – A Survey among Dentist at Durg-Bhilai

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Abstract: The aim of this study was to assess the self-perceived strategies on administration of antibiotic prophylaxis among dental practitioners. The study duration was of one month duration from June 2016 to July 2016. A self-designed structured and pretested questionnaire was administered among all the registered dental practitioners and dental institutional teaching faculty of Durg-Bhilai, Chhattisgarh. Questions regarding the common antibiotics prescribed and the indications for which the antibiotics prescribed were included in the questionnaire. Total of 127 dentists responded to the questionnaires with a response rate of 100%. It was observed that Amoxicillin (91.3%) was the commonly preferred antibiotics followed by fluoroquinolones (20.5%). Endodontic procedures (57.5%) and surgical procedures (45.7%) are most common procedures for which antibiotic prophylaxis were prescribed. The drug of first choice for patients with an allergy to penicillin was clindamycin (30.7%). 74.8% of respondents have never undergone any form of training on antibiotic prescription. Amoxicillin was the most commonly preferred antibiotics subsequent to different dental procedures. There is a clear need to emphasize correct diagnostic methods and develop contextualized prescription guidelines and educational initiatives, so that the optimum effect of antibiotics will be achieved without compromising patient's health.

Keywords: Antibiotics, amoxicillin, Dentists, Durg.

INTRODUCTION

Antibiotics are type of medications that kill or inhibit the growth of bacteria. They treat infections caused by micro-organisms.

Anti means “against” and bios means “life”. Oral infections care represents a big portion of the work handled by dentists, they have to prescribe antibiotics to prevent infections [1]. Approximately one third of all antibiotics used in medicine are prescribed for prophylaxis [2]. Dental practitioners routinely prescribe antibiotics to manage oral and dental related infections either therapeutically or prophylactically [3].

Antibiotic prophylaxis was first proposed for dental treatment after infective endocarditis was found to be linked to bacteremia's following dental treatment [3]. Theoretically, antimicrobial prophylaxis prevents distant site infection from developing as a consequence of procedure-induced bacteremia. In the dental

community, overprescribing of medications has become a trend [4]. The empiric and broad use of antibiotic prophylaxis is no longer acceptable, but details regarding responsible prescribing remain problematic. Narrow spectrum antibiotics are to be considered as the first choice because of fewer side effects and also due to increasing incidence of bacterial resistance, hence judicious use of antibiotics in dental surgical procedures is required [5].

As studies of the need for and the effectiveness of antibiotics in the dental field continue, there is an ongoing debate over their role in prophylaxis. It is the responsibility of the medical and dental communities to be aware of the latest protocols and to prescribe

appropriately. One survey found that only 39% of dentists and 27% of physicians followed guidelines appropriately. Many practitioners rely on recommendations of other practitioners — who often cite anecdotal evidence — or decide that, when in doubt, the wise and conservative course is to prescribe [3]. Previous studies in general dental practice have centered on how practitioners prescribe prophylactically to prevent endocarditis. There is however some evidence those prophylactic antibiotics are being prescribed in dentistry when there is little evidence that they would have any beneficial effect. Hence, antibiotic prescription has great chances of misuse and therefore it is essential to continuously monitor knowledge and pattern of prescription. So the prime necessity 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 assess the self-perceived strategies on administration of antibiotic prophylaxis among dental practitioners

MATERIALS AND METHODS

The present descriptive cross-sectional study was carried out to assess the self-perceived strategies on administration of antibiotic prophylaxis among dental practitioners of Durg district over a period of two months i.e. June – July 2016. The ethical clearance was obtained from the Ethical Committee of Rungta College of Dental Sciences and Research, Bhilai. All the registered clinicians (Indian Dental Association, Durg – Bhilai Branch), teaching faculty and postgraduate students of the dental colleges in Durg district was invited to participate in the study. A prior written informed consent was taken from each study participants after explaining the nature of the study. A self-designed, self-administered, pretested and validated questionnaire was designed after reviewing the literature about antibiotic prescription pattern among the dentists. Questionnaire included general characteristics of the study subjects including age, gender. The questionnaire comprises of close as well as open ended questions regarding prescription of

antibiotic prophylaxis in various dental diseases and condition. The questionnaire also focussed on the various antibiotics dentists’ preferred to prescribe in various dental procedures like extractions, abscess management, endodontic procedures, periodontal procedures etc. It also comprises questions regarding antibiotic prophylaxis in various systemic diseases, pregnant women, patients allergic to penicillin. Question regarding any training on antibiotic use was also included in the questionnaire. The questionnaire was prepared in English for ensuring comprehension by all Dental practitioners and pretested in a pilot study conducted in 10 dental practitioners and modifications were made accordingly. The validation was carried out in a panel expert and among 10 experts in the subjects. Test-retest analysis showed a good reliability (Cronbach’s alpha ($\alpha=0.76$)) of the questionnaire. All the dentists attending on the particular days of the study (as decided earlier with permissions form the authorities) were invited to participate and those providing consent were included in the study. Questionnaire was given to dentists and information regarding purpose of the study was given. Sufficient time was given to the dentists to answer the question. The investigator gave required information and clarified doubts wherever necessary.

The data collected was entered into MS Office Excel Sheet 2007 and subjected to statistical analysis using the Statistical Software SPSS version 19.0. Descriptive statistics were used to summarize the results.

RESULTS

127 dentists filled the questionnaire thoroughly and returned to the investigator with a response rate of 100%. Among those dentists 56(44.1%) were male while 71(55.9%) were female. Age of the participant ranges from 23-50 with a mean± S.D. of 29.63±5.13. Amoxicillin group of antibiotic were reported to be used by 91.3% dentists followed by fluoro quinilones (20.5%), cephalosporin (12.6%), metronidazole (4.7%) and aminoglycosides (3.1%). Routine prescription of antibiotic use and various systemic conditions for antibiotic prescription are shown in Table 1.

Table-1: Prescription of antibiotic prophylaxis by dentists in their routine practices and in various existing systemic diseases/condition

| Questions | Frequency | Percentage |
|---|-----------|------------|
| Routine prescription for antibiotics in dental practice | 110 | 86.6% |
| Antibiotics as prophylactic measures in every case | 26 | 20.5% |
| Systemic diseases | | |
| Diabetes | 61 | 48% |
| Cardiac diseases | 57 | 44.9% |
| Infectious diseases | 7 | 5.5% |
| Immuno-compromised patients | 10 | 7.9% |
| Others | 37 | 29.1% |

Endodontic procedures lead the list of dental procedures for which dentists prescribe antibiotics as 57.5% dentists prescribe antibiotics in endodontic procedures followed by surgical procedures(45.7%), abscess management(45.7%),periodontal procedures(29.9%).On prescription of antibiotics in

various dental procedures namely extraction of grossly decayed tooth, orthodontic extraction, traumatic injuries and endodontic therapies 115,36,104,92 dentists said ‘yes’ they prescribe antibiotics in these procedures. The prescription of antibiotics in other dental procedures is summarized in Fig 1.

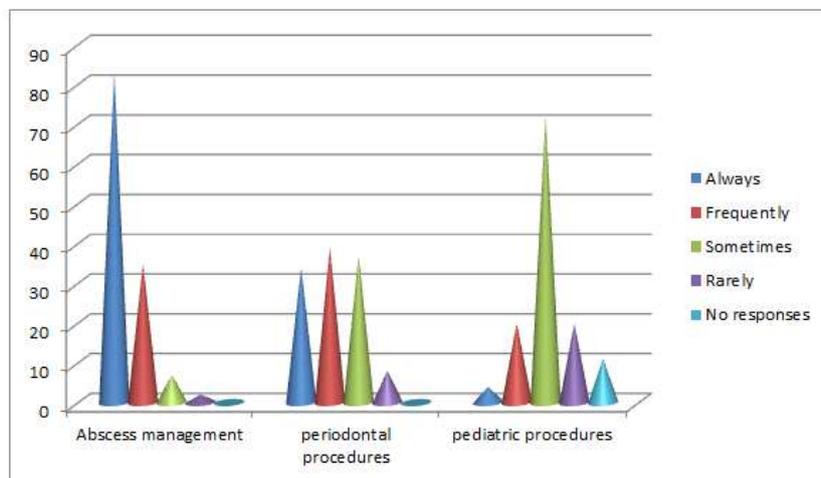


Fig-1: Characteristic of responses of dentists towards prescription of antibiotics after various dental treatments

Description of choices of antibiotics in routine dental procedures, in pregnant women and in immune-compromised patients is described in Table 2. Among periodontal procedures, scaling and root planning as a dental procedure was responded highest as 65.4% dentists replied that they will prescribe antibiotic for scaling and root planning which is followed by

periodontitis (6.3%). Cephalosporin’s group of antibiotic were reported to be used by 30.7% dentists followed by clindamycin (21.2%), fluoro quinilones (20.8%), erythromycin (9.4%) as the highest preferred antibiotics by the participating dentists in patients allergic to penicillin group of antibiotics.

Table-2: Characteristics of antibiotic prescription after various dental procedures among participating dentists of Durg- Bhilai

| Dental Treatment | Amoxicillin | Amoxicillin + Clavulanic Acid | Metronidazole | Cephalo-Sporins | Fluoro-Quinilones | Others | Not Required |
|-------------------------------------|-------------|-------------------------------|---------------|-----------------|-------------------|-----------|--------------|
| Extraction of grossly decayed tooth | 78(61.4%) | 15(11.8%) | 0(0%) | 7(5.5%) | 5(3.9%) | 2(1.6%) | 20(15.7%) |
| Orthodontic extractions | 27(21.3%) | 0(0%) | 0(0%) | 2(1.6%) | 2(1.6%) | 0(0%) | 96(75.6%) |
| Abscess management | 51(40.2%) | 23(18.1%) | 20(15.7%) | 2(1.6%) | 13(10.2%) | 3(2.4%) | 15(11.8%) |
| Traumatic injuries | 63(49.6%) | 15(11.8%) | 0(0%) | 11(8.7%) | 1(0.8%) | 1(0.8%) | 2(0.5%) |
| Periodontal therapies | 41(32.3%) | 9(7.1%) | 19(15%) | 2(1.6%) | 8(6.3%) | 19(15%) | 29(22.8%) |
| Endodontic therapies | 57(44.9%) | 8(6.3%) | 6(4.7%) | 2(1.6%) | 6(4.7%) | 0(0%) | 48(37.8%) |
| Pediatric procedures | 72(56.7%) | 6(4.7%) | 1(0.8%) | 3(2.4%) | 2(1.6%) | 2(1.6%) | 41(32.3%) |
| Pregnant women | 70(55.1%) | 2(1.6%) | 0(0%) | 21(16.5%) | 4(3.1%) | 9(7.1%) | 21(16.5%) |
| Immuno-compromised | 36(28.3%) | 19(15%) | 0(0%) | 33(26%) | 7(5.5%) | 17(13.4%) | 15(11.8%) |

Astonishingly, the data reported that 74.8% of the dentist surveyed didn't received any formal training for antibiotic prophylaxis during the last 7 years while

only 7.9% said they received training in last year as shown in Fig 2.

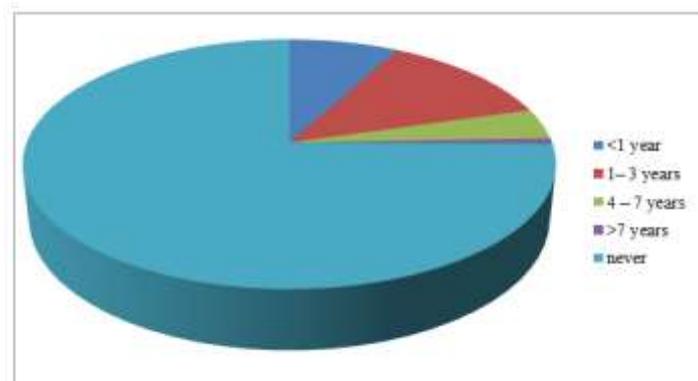


Fig-2: Time lapse since any form of training on antibiotic use by dentist

DISCUSSION

This decade, antibiotic resistance has been emphasized by the World Health Organization on 7th April 2011. The theme for the year was “Antibiotic Resistance” The reason being the growing concern over the judicious use of antibiotics and specifically antibiotic prophylaxis constitutes major threat to public health. Reliance on antibiotic alone especially broad spectrum, may result in failure of controlling infection and leads to development of resistant bacterial strains. Although it is of paramount importance to prevent the infection but a balance has to be made a problem of antibiotic resistance and side-effect associated with excess antibiotic use. The studies on antibiotic prophylaxis prescription provide an insight into the quality and reveal determinants of drug prescription and use.

By keeping in consideration this fact, a question pertaining to the prescription of antibiotic prophylaxis in dental practice routinely was asked to dental practitioner over a 86% said yes, which may be a pressing issue in over usage of antibiotic. In spite of the recommendation by American Heart Association to give antibiotic prophylaxis to patient suffering from diabetes and hypertension still less than 50% dentists followed the same. This is in line with the findings reported by Lauber *et al.* [6], Lockhart *et al.* [7]. And Ellervall *et al.* [8].

Amoxicillin by the virtue of its ability to attain high serum concentration and its effectiveness against facultative and some anaerobic flora for post-operative infections makes it as a logical choice for use as an adjunct to a good surgical technique. The same was assessed and it was found that 91.3% in the present study prescribe amoxicillin as a drug of choice. The same findings are reported by Kamulegaya *et al.*[9]., Palmar *et al.*[10], Garg *et al.* [11], Maslamani *et al.*[12], Rachmaveti *et al.*[13], Maniyar *et al.*[1]., Lauber *et al.*[6], Anderson *et al.*[14], Saadat *et al.* [15].

As far this present study is considered penicillin based antibiotics were first choice to treat dental infections but several studies reports patients are sometimes allergic to penicillin group of drugs. So, it was necessary to assess the drug of choice being prescribed as an alternative for the patients allergic to penicillin and was found that cephalosporin was overwhelming used by the participating dentists. Cephalosporins are used as an alternative to amoxicillin as they are less allergenic, have decrease toxicity risks, added with broad spectrum of activity but it is generally seen that patient who are allergic to penicillin are also found to be allergic to cephalosporins group of drugs. When compared with other studies report the finding were contradictory to the findings reported in other studies in which erythromycin and clindamycin are the drug of choice for patients allergic to penicillin. Palmar *et al.*[10] and Saadat *et al.*[15] reported clindamycin as first line of drug while erythromycin as first line of drug was reported by studies done by Garg *et al.*[11], Januay *et al.*[5], Koekoi *et al.*[16].

Antibiotic use in pregnant women is of great dilemma as whether to prescribe antibiotic or not. In present study 55.1 % of respondent dentists preferred amoxicillin as a drug of choice if required for pregnant women. This finding is in corroboration with the study done by Kamulegaya *et al.*[9]. The studies on antibiotic prophylaxis prescription provide an insight into the quality and reveals determinants of drug prescription and use.

The value of prophylactic antibiotics in all of the immune-compromised patients for prevention of post-operative complication is questionable or unproven; authorities stated that there is no need for antibiotic prophylaxis for dental treatment. Immuno-compromised patient in absence of bacterial infection, do not generally require antibiotic prophylaxis. However, a clinical judgment should be made where a

bacteraemia is likely to occur, such as in cases of extraction teeth.

About 56% would prescribe antibiotics irrationally for acute pulpitis, chronic periapical lesions, chronic marginal gingivitis, dry socket, before and after root canal treatment, before and after extraction and before the 3rd molar surgery in healthy person

Antibiotic prophylaxis is usually prescribed by dentists to prevent local infection at surgical sites and avoid post-operative complications (i.e. pain, wound breakdown, impaired healing, necrotic bone exposition, soft tissue swelling etc). It is still a common and incorrect practice among dentists extending the prescription of antibiotics throughout the post-surgical period (from 6-8 hrs to 5 days after the surgical procedures).

CONCLUSION

The dental profession as a whole needs to commit to a deeper understanding of the global effect of unnecessary antibiotic prescription. Antibiotics when used widely and discriminately are precise life-saving drugs, however if used indiscriminately there are significantly short term and particularly long term adverse sequelae.

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