Antibiotics, boon or a bane? A survey on knowledge, attitude, and practice

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Abstract

Background: Dentists prescribe antibiotics in the context of managing oro-dental infections. It is seen that the number of prescriptions is on a rise each year. Furthermore, popping of an antibiotic for any and every reason by a common man has led to an overuse and misuse of antibiotics among the general population. However, literature suggests that there have been a substantial increase in the number of antibiotic prescriptions by each year by the dentists. Limited numbers of studies have been carried out in India to assay the prescription pattern of antibiotics among the dental practitioners.

Objective: This survey was carried to assess the knowledge, attitude, and practice of antibiotic prescriptions and awareness on antibiotic resistance among the dental practitioners in an institution in Mangalore.

Materials and Methods: A self-devised questionnaire was prepared in English to collect the demographic data and information regarding the prescription pattern of antibiotics among dentists in an institution in Mangalore.

Results: The survey evidenced a response rate of about 78%. Our survey showed that there was adequate knowledge about the antibiotics and noted a fair antibiotic prescribing practice by the dental practitioners. Although, we felt that there were certain conditions that the dental practitioners prescribed antibiotics where an operative intervention would have sufficed, necessitating a need for development of clear guidelines on the antibiotic prescribing practices for the dental practitioners.

Conclusion: Dental infections arise as a result of local factors. Hence, antibiotics should be used only as an adjunct to the operative intervention. Judicious antibiotic prescription by the dental practitioners needs to be checked on by establishing a surveillance system. Furthermore, due importance needs to be given to the general public against the misuse of the antibiotics which would help us to have a control over the antibiotic resistance crisis.
the questionnaire to fill in at the appropriate sections. The questionnaire was handed in person to the dental practitioners. All the participants were given their free will to disclose their identity, if they found it comfortable. A separate section was given at the end of the questionnaire to welcome them on their suggestions, if any.

**Questionnaire**

The questionnaire was designed to assess the knowledge, attitude, and practice of antibiotic prescribing by dental practitioners. The questionnaire used a simple format of multiple choice questions, the participants were requested to tick the relevant choices. Furthermore, they were given the space to answer in a separate column for the majority of the questions, if they wanted to express more if any.

The initial part of the questionnaire aimed at gathering the information on their main stream of practice, whether they were private practitioners, in academic institutions, hospital dentistry or in a trust/health-care centers. The period of practice and the primary source of updating their knowledge in the field of dentistry were also evaluated.

The questions on the knowledge about antibiotics, in general, were asked. They were on the general action of the antibiotics, their role in the host defense, bacteriostatic and bactericidal antibiotics, and multiple drug combinations.

The clinical conditions for which the dental practitioner would prescribe antibiotics were investigated. The clinical conditions included were, acute pulp and periapical infections, cellulitis, infections involving the periodontium, acute ulcerative gingivitis, and dry socket were the primary ones.

The questionnaire also included the common dental procedures that the dental practitioners would prescribe the antibiotics. Tooth extractions, periodontal surgeries, endodontic therapies, and certain orthodontic/prosthodontic therapies were also included.

Information was sought on if history on drug allergy and patient’s medical history was evaluated at the time of antibiotic prescription. Antibiotic sensitivity tests were performed when the situation demanded was also questioned on.

**Results**

A total of 195 replies out of 250 were received giving a response rate of 78% [Graph 1]. Of the 195 respondents, 31 were incomplete giving 164 usable replies. 12% of the dental practitioners had an experience of 20 years in the dentistry, followed by 65% of them with an experience of 11-20 years, 20% between 5 and 10 years and a small percentage (3%) had an experience between 1 and 5 years in the field dentistry.

39% of them had attended the conferences and continued dental education programs, as a means of updating their knowledge in recent advances associated with dentistry. 37% used scientific literature or published articles and 24% of them went by internet as their means of updating dentistry in the recent scenario [Graph 2].

Graph 3 shows the clinical conditions for which the dental practitioners would prescribe antibiotics. Over 70% of them prescribed antibiotics for acute pulp and periapical infections (72%), cellulitis (82%), acute necrotizing gingivitis (73%), and periodontal abscess and dry socket (68%). 43% of the dental practitioners felt the need to prescribe antibiotics in case of traumatic tooth extractions. A significant number of them did not feel the necessity to prescribe antibiotics in case of endodontic and periodontal therapies.

The dental practitioners preferred to choose antibiotics to specific conditions assuming no allergy to penicillin. Amoxicillin was the most commonly prescribed antibiotic. For patients allergic to penicillin, cephalosporins were the most commonly prescribed antibiotics by the respondents. The majority of the practitioners (98%) did elicit the patient’s medical history before prescribing the antibiotics.

When asked about the choice of antibiotics, 51% of them sought what the literature said and 49% of them went by what the medical representatives would recommend.

98% of the dental practitioners felt that antibiotic resistance is of growing concern. 94% of them felt that awareness about a clear guidelines and prescribing policies needs to be developed in an attempt to limit the antibiotic resistance scenario.

**Discussion**

Antibiotic resistance has become a threat to public health and has posed a worldwide problem. Evidence suggest that inappropriate prescribing practices by the dental practitioners has been on the rise since few years and this could lead to the issue of antibiotic resistance.\(^1\)\(^2\)\(^3\) It is not only the unsystematic prescribing practices by the health professional could be considered as a sole factor for the rise in antibiotic resistance, by also the misuse and overuse of the antibiotics by the general public needs to be kept...
in mind. The fact that with each year, the number of antibiotic prescriptions is increasing shows that it is important to examine the role of the dentists in prescribing antibiotics in day-to-day practice.

This study evidenced a fair antibiotic prescribing practice by the dental practitioners. Many oral diseases present to the dentists primarily as inflammatory that have association with pain. Dental infections that present in the form of pulpitis and periapical periodontitis, require only operative measures such as restorations, root canal therapy or extraction of the tooth if not restorable. Oral infections associated with elevated body temperature and signs of systemic spread such as lymphadenopathy and trismus require antibiotics.\[4,5\]

Our survey showed that the dental practitioners were well aware of these indications and used the antibiotics wisely. Cellulitis because of its possibility to spread through lymph node and blood circulation, which may result in a septicemia should be treated with antibiotics.\[6\] The dental practitioners in our survey prescribed antibiotics for orofacial infections with systemic involvement.

Acute periapical infection, dry socket, and chronic inflammatory periodontal conditions are nonindicated clinical cases for antibiotics. Systemic antibiotics have been used at an increasing rate in case of periodontal infections. However, the available evidence suggests that the prescribing antibiotics should be an exception only in cases where the conventional therapies do not suffice.\[5,9\] Systemic antibiotics must be used in cases of acute periodontal diseases where debridement and drainage are not possible, where there is local or systemic spread of the infection has occurred.\[10\] Almost 50% of the dental practitioners in our survey prescribed antibiotics in case of dry socket which is in accordance with studies done by Palmer et al.,\[11\] Salako et al.,\[12\] and Öcek et al.\[13\] A study by Shahla Kakoei et al. noted that about 20% of the dentists prescribed antibiotics in case of a dry socket.\[14\]

Localized swelling is another nonindicated condition where there is no need for antibiotics. Periodontal abscess, acute necrotizing ulcerative gingivitis, and pericoronitis are few of the localized oral lesions that are indicated for antibiotics.\[15\]

It is said that antibiotic prophylaxis taken before number of dental procedures is a common practice. The antibiotics have been advocated to reduce the likelihood of post-operative complications such as infection, dry socket, and in prevention of bacterial endocarditis. The evidence is poor to nonexistent where antibiotics would act to prevent the infection from a surgical wound.\[4\] The pre-operative parenteral antibiotic prophylaxis in cases of a routine third molar surgery is unwarranted.\[6,15\] There is no evidence to suggest that a medically uncompromised and fit individual require prophylactic prescribing of antibiotics for the dentoalveolar surgeries.\[16,17\]

This survey has a few limitations which includes that it is a preliminary study conducted and we hope to conduct in a systematic manner in our future endeavors.

Below are some recommended treatment modalities for common inflammatory oral conditions:\[4\]

1. Inflammatory causes of oral pain
   - Associated with the pulp
     i. Reversible pulpitis
     ii. Irreversible pulpitis*
     iii. Periapical periodontitis*
     iv. Localized dentoalveolar abscess*
     v. Facial cellulitis**
   2. Periodontal conditions
     i. Lateral periodontal abscess**
     ii. Pericoronitis**
     iii. Dry socket*
     iv. Plaque induced gingivitis*
     v. Chronic periodontitis*

   In addition to the adequate dosing regimens and professionally responsible antibiotic prescribing practices, the general public is required to be educated in terms of the importance in restricting the use of antibiotics to only in cases of severe infection. Dental patients not only pressure their dentists the get their antibiotic prescription, they also self-medicate, which was found alarmingly high in some developing countries.\[4\]

* Operative intervention is needed, such as filling, root canal treatment, local irrigation, incisional drainage, and oral hygiene measures.
** Empirical antibiotic prescribing is needed as an initial treatment. Operative intervention\(\text{(s)}\) may be initiated on the same visit or later. Oral hygiene measures are mandatory.

Graph 2: Various sources for updating the knowledge by the dental practitioners

Graph 3: The clinical conditions for which the dental practitioners prescribed antibiotics
Conclusion

Prescribing antibiotics should be done with caution and care. A fundamentally changed view of antibiotics is required. With every use of antibiotic may diminish its effectiveness when used at a later date.

Establishment of a surveillance system is to be recommended for a check on the judicious antibiotic prescribing practices by the dental practitioners and also on the ease of availability of the antibiotics to the general public.

For the present and future generations to have access for effective prevention and treatment of bacterial infections as part of their right to health, all of us need to act now. The window of opportunity is rapidly closing!

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References
