Original Article

Knowledge and attitude of private oral health-care practitioners about antimicrobial drugs prescription in the management of periodontal diseases: A cross-sectional observational survey

ABSTRACT

Background and Aim: The present study aimed to evaluate the knowledge and attitude of antimicrobial drugs prescribing by oral private health-care practitioners in the management of periodontal diseases across Mandi, Himachal Pradesh, India.

Design: This was a descriptive cross-sectional percentage-based survey.

Materials and Methods: A descriptive observational cross-sectional Study was conducted with the pretested and structured questionnaires which were sent physically to private oral health-care practitioners of Mandi district of Himachal Pradesh, India. The study was carried out for 2 months. A self-orchestrated questionnaire comprising 10 questions was sent by dental students to private practitioners of Mandi to assess their awareness along with a point of view concerning antimicrobial drugs prescribing for periodontal diseases. Facts entered in an Excel file were examined using SPSS version 22. Illustrative stats were carried out.

Results: The survey was responded by 100 private practitioners providing oral health care who accomplish the questionnaire. Most of the private practitioners were in the age group of 20 and 60 years, and 63% were male and 37% were female. There was a statistically significant difference between knowledge on prescribing antimicrobial drugs by private oral health-care providers in Mandi, Himachal Pradesh, India. Amoxicillin Alone, amoxicillin with clavulanic acid and metronidazole was the most prescribing drug followed by clindamycin by private oral healthcare Practitioners in the management of periodontal diseases.

Conclusion: Most of the private oral health-care providers practicing in Mandi, Himachal Pradesh, routinely prescribed prophylactic antimicrobial drugs, and the observational survey outcome shows that although the private practitioners do know about the antimicrobial drugs, they should be very careful while prescribing antimicrobial drugs in the management of periodontal diseases. Because of increasing microbial resistance, an immediate remedy is the need of the hour to tackle the devastating consequences of antimicrobial drugs resistance.

Keywords: Antimicrobials, cross-sectional study, periodontal diseases, private practitioners

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INTRODUCTION

Periodontitis with multifactorial etiology originating from gingival disease is an inflammatory and infectious disease of supporting structures of teeth due to bacterial biofilm growing on the tooth surface. It denotes the considerable reason for the loss of tooth structure in older people directing to indelible illness and treatment demands.[1]

Nowadays, we have several medications that can be used to treat oral infections, but it is still uncertain which antimicrobial

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drugs will benefit a patient in prognosis with acute or chronic periodontal infection with no adverse effects.

In 2006, a research study was published on the pattern of antibiotic resistance trends in China, Kuwait, and the USA by Zhang *et al*.[1] who found that from 1999 to 2003, the highest level of growing antibiotic resistance was in China, followed by Kuwait. The incorrect antimicrobial drugs use includes unnecessary dosage, unnecessary length, incorrect antimicrobial option, improper antimicrobial use, and unjustified/unproven usage of therapeutic or prophylactic agents. Increasing, insufficient, and inappropriate uses of antimicrobial drugs in periodontal infections are critical factors in enhancing the resistance,[2] undermining their therapeutic efficacy, increasing treatment failures, and leading to longer disease episodes with higher costs and death rates.[3,4] In order to improve the antimicrobial drugs application in periodontal infections, the variety of factors affecting medication acting must be identified and addressed to improve the use of antimicrobial drugs in periodontal infections.

Systemically administered antimicrobial drugs can help in reducing the spread of bacterial biofilm on the tooth surface, which is unattainable through mechanical therapy, along with clinically undetectable locations that could be responsible for chronic re-illness.[5]

Although it is essential to weigh the potential benefits and adverse effects of use of antimicrobial drugs, including the existence of impermeable bacterial strains, in determining whether therapeutic antimicrobial drugs treatment should be used alone or with mechanical therapy.[6] In periodontal disease before prescribing an antimicrobial drug pre- or post prophylaxis, a comprehensive examination of the past and the ongoing condition of the individual is obligatory. The current descriptive survey was designed to evaluate private oral health-care professionals' knowledge and attitude in prescribing antimicrobial drugs for the treatment of periodontal diseases.

MATERIALS AND METHODS

Research plan and inhabitants

The main objective of this 2-month questionnaire-based descriptive cross-sectional survey on 100 private oral health-care professionals was to evaluate the knowledge and attitude about the antimicrobial drugs prescribing in periodontal infections of Mandi district of Himachal Pradesh, India. The study population consisted of 100 private oral health-care practitioners doing practice in Mandi district of Himachal Pradesh. Before finishing the questionnaire, the verbal consent of each individual was diarized.

Preliminary testing of questionary

A questionary was formed and evaluated amid a comfortable representative of ten dental surgeons, to whom we have asked about the simplicity and transparency of the questionary. Depending on their report, no corrections were deemed necessary.

Methodology

On a predetermined day, a survey form was distributed to private oral health care practitioners who participated freely in the survey. An invitation to participate in pre-formed questionnaire survey was sent randomly to selected private oral health care practitioners of Mandi Himachal Pradesh. The questionnaire was passed to 120 private oral health-care practitioners, of which 100 private practitioners participated who were practicing and treating periodontal infections in Mandi, Himachal Pradesh, India. Investigators collected the survey data from 100 private practitioners doing practice in Mandi district of Himachal Pradesh. The participation was optional, unspecified, and free of charge. The survey was carried out for 2 months and was omitted after the deadlines. In total, 100 responses were received by researchers, and the participation response number was 100 within the time limit.

Questionary

The study questionnaire survey was designed to examine the awareness and perceptions and as a framework for evaluating the expertise, knowledge, and attitude of private practitioners prescribing antimicrobial drugs in the treatment of periodontal infections:

1. Prescribe antimicrobial drugs in periodontal diseases yes/no/depending on severity
2. How antimicrobial drugs should be used in periodontal disease
3. In periodontal disease, choice of antimicrobial drug prescription pre, post prophylaxis, or both
4. When systemic antimicrobial drugs advised, which antimicrobial drugs will be selected for periodontal disease in an adult healthy with no medical allergies
5. What is the frequency of antimicrobial drugs prescribed per day
6. What is the duration of antimicrobial drugs prescribed
7. When systemic antimicrobial drugs are advisable, which anti microbial drugs will be selected for the treatment of periodontal disease in a healthy adult patient with an history of allergy to penicillin
8. In which condition antimicrobial drugs are considered necessary for the treatment of periodontal infections
9. In which all periodontal conditions do you think, antimicrobial drugs are not required
10. What type of antimicrobial drugs delivery would you prefer for periodontal diseases?

Statistical interpretation

The response format was based on facts entered in an Excel file that was reviewed using SPSS version 22 (SPSS Inc., Chicago, IL, USA). Illustrative stats were carried out to calculate the percentage of the right representative concerning age, sex, and answer mention on the survey sheet. Frequency distributions were carried out to report the proportion of feedback concerning the prescription of antimicrobial drugs and in patients where the use of an antimicrobial drugs was appropriate.

The statistical significance was set at a level of 5% ($P < 0.05$), and the power sample was studied using an n% ratio.

RESULTS

Table 1 gives a description and a list of the responses to ten questions concerning the knowledge and attitude of private oral health-care professionals practicing in Mandi, Himachal Pradesh, India. Of 100 private practitioners, 62 were male and 38 were female. The use of antimicrobial drugs in the treatment of periodontal diseases is summarized and also depicted in Figures 1-9, respectively.

The survey questionnaire was forwarded to 120 registered private dental practitioners in Mandi, Himachal Pradesh, of which 100 private oral care health-care providers completed the survey to obtain an 83.33% response rate. The latest survey comprised 62% of males and 38% of females, 68% of which were younger than 40 years old; 81% had >10 years of practicing experience. Furthermore, it indicates that 88% of the private oral health-care practitioners from Mandi, Himachal Pradesh, recommend the use of antimicrobial drugs in the treatment of periodontal infections. In comparison, 10% of the respondents answer no and 2% approved antimicrobial drugs prescriptions based on the conditions and severity [Table 1].

Figure 1 indicates the therapeutic use of antimicrobial drugs alone or to be prescribed along with mechanical therapy. According to the survey, 77% of the private oral health practitioners recommended that the prescription of the antimicrobial drugs along with mechanical therapy will provide excellent prognosis in the treatment of periodontal infections.

Table 1: Frequency distribution of participants

Variables	Number
Male:female	62:38
Age between 25 and 40 years	68
Age more than 40 years	32
Antimicrobial prescription (%) (yes/no/depends on severity)	88/10/2

Figure 2 indicates antimicrobial drugs', prescription as pre, post, or both in the treatment of periodontal infections. It indicates that 47% support the prescription of antimicrobial drugs before and after prophylaxis.

Figure 3 indicates that the drug of choice by private oral health-care practitioners of Mandi, Himachal Pradesh, for the treatment of periodontal infections was amoxicillin alone or with a combination of clavulanic acid. Amoxicillin-clavulanic acid and metronidazole were the preferred antimicrobial drugs prescribed in periodontal infections by private oral health care practitioners of Mandi, Himachal Pradesh, India. In the management of periodontal disease, 58% of the private oral health-care practitioners recommend the dosage of the antimicrobial drugs three times a day, followed by 31% who recommend two times a day, as shown in Figure 4. The duration of prescription of the antimicrobial drugs was 7 days by 50% of the private practitioners shown in Figure 5.

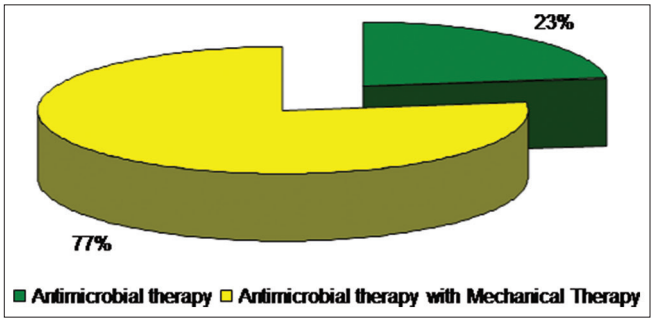

Figure 1: The use of antimicrobial drugs alone or with mechanical therapy

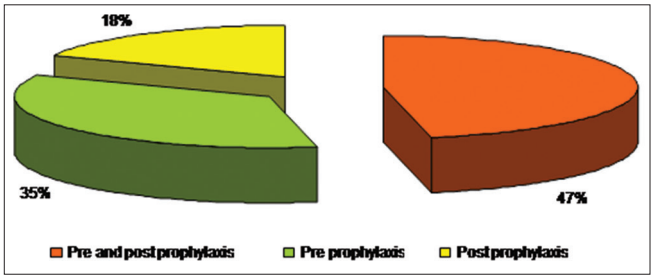

Figure 2: Prescription of antimicrobial drug pre or post treatment

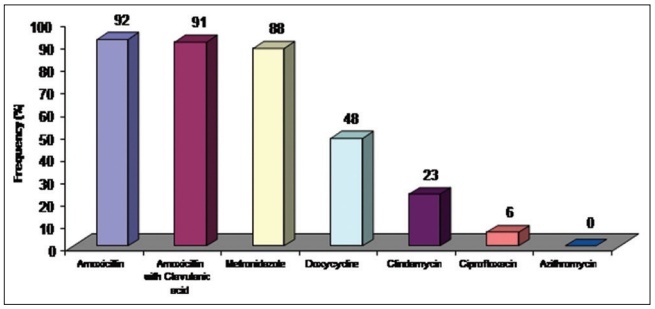

Figure 3: Preferred antimicrobial drug prescribed

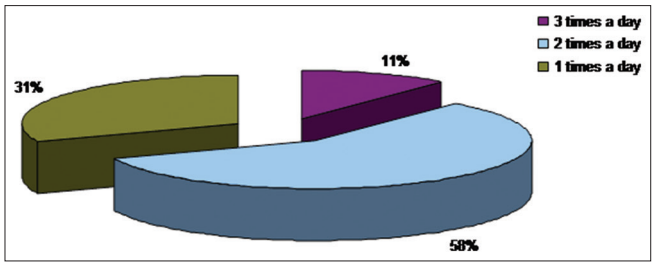

Figure 4: Frequency of antimicrobial drug prescribed

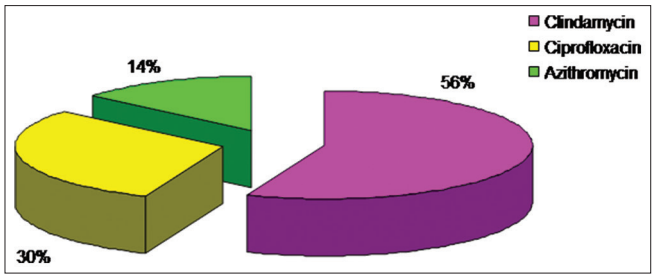

Figure 6: Choice of drug in penicillin-allergic patients

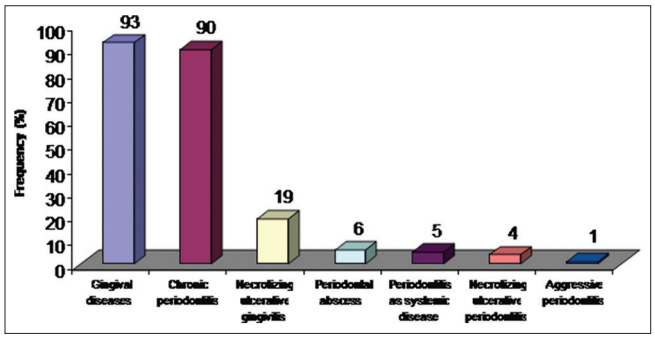

Figure 8: Prefer not to recommend antimicrobial drugs in these periodontal infection

Figure 6 shows that 56% of the private oral health-care practitioners preferred clindamycin as the alternative drug of choice for the patient allergic to penicillin.

Ninety-four percent reported the prescription of systemic antimicrobial drugs in the treatment of aggressive periodontitis, whereas 90%, 68%, and 60% [Figure 7] of the respondents did so for in necrotizing ulcerative gingivitis, periodontitis, and mucogingival surgery, respectively. Ninety percent of the private oral health-care practitioners recommend another mode of treatments instead of prescribing antimicrobial drugs in chronic periodontitis, whereas 19%, 6%, 5% [Figure 8] of Mandi private practitioners do not prefer to prescribe antimicrobial drugs in necrotizing ulcerative gingivitis, periodontal abscess, and periodontitis as a systemic disease.

Figure 9 indicates the preferred method of antimicrobial drugs delivery in periodontal infections.

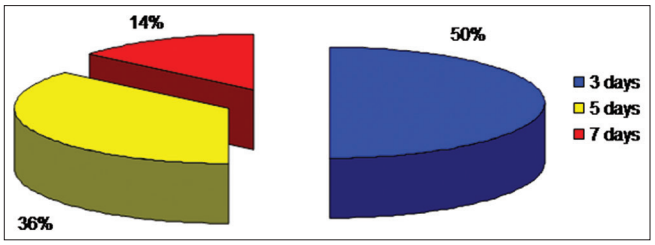

Figure 5: Duration of antimicrobial drugs prescribed

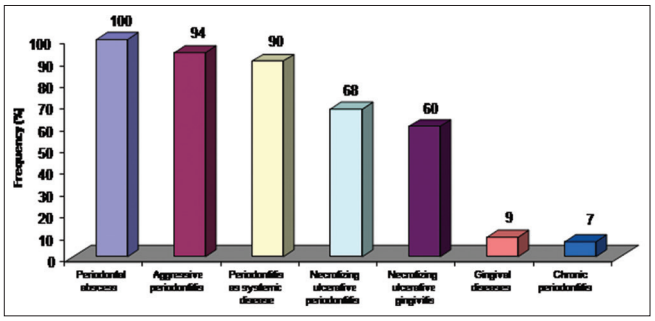

Figure 7: Prefer to recommend antimicrobial drugs in these periodontal infection

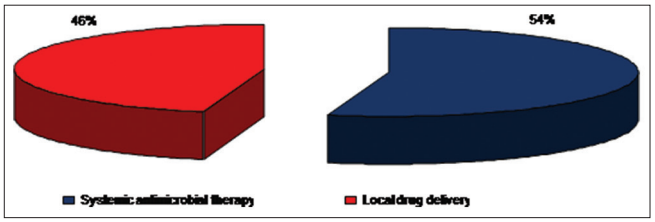

Figure 9: Preferred method for antimicrobial drug delivery

DISCUSSION

In Mandi, Himachal Pradesh, a survey conducted to assess the knowledge and attitudes of private dental practitioners concerning antimicrobial drugs prescription has discovered that maximum practitioners lack good enough expertise in prescribing antimicrobial drugs in the treatment of periodontal infections. After findings of this descriptive survey, it will assist in the assessment of adequacy as an educational campaign for the private oral health care practitioners of Mandi, Himachal Pradesh, India. It will provide additional insight into designing future multifaceted interventions to encourage rational antimicrobial drugs use and replenish the knowledge and attitude gaps as an effort against antimicrobial resistance.[7]

When questioned about antimicrobial drugs used, 47% of the private oral health care practitioners of Mandi, Himachal Pradesh, prescribed antimicrobial drugs pre and post prophylaxis, followed by 35% only pre prophylaxis and 18% post prophylaxis [Figure 2]. With an addition to mechanical therapy, it was found that 77% of the private oral health-care professionals use antimicrobial drugs therapy

with mechanical therapy [Figure 1] in support of a study done by Aline Vicentini Monteiro *et al*.[8] in the year 2013. However, a significant part (23%) shown in Figure 1 of private oral health care practitioners did not indicate this in combination with mechanical therapy.

In this survey, amoxicillin was 92% prescribed drug in periodontal treatment, followed by amoxicillin with clavulanic acid 91% been found to be the most commonly prescribed antimicrobial drugs in Mandi, Himachal Pradesh, shown in Figure 3. Works of literature and a survey published in Riyadh, Saudi Arabia, reported that amoxicillin with clavulanic acid was the most frequently prescribed antimicrobial drugs among dental practitioners.[8]

Reports published in the literature of research studies have been demonstrated that metronidazole alone or metronidazole with amoxicillin as monotherapies was proven to have a marginal and shortterm impact of the antimicrobial alone in treatment of periodontal infections.[9] Some published kinds of literature do not endorse the monotherapy hypothesis because of poorer outcomes in terms of conducted research. Metronidazole was found to be most effective against obligate anaerobes but not against facultative bacteria, so it becomes necessary to be used in conjunction with other antimicrobial drugs.[9] In our survey, 88% of the private oral health-care practitioners prescribe metronidazole in the treatment of periodontal infections shown in Figure 3. Few private oral health care practitioners also prescribed doxycycline 48%, followed by clindamycin 23% and ciprofloxacin 6% with or without other antimicrobial drugs.

The questionnaire of the frequency of prescribing antimicrobial drugs was three times a day by 58% of the private oral health-care practitioners, followed by two times 31% and once a day by 11% in treating periodontal infections shown in Figure 4. In another questionnaire of the duration of prescribing antimicrobial drugs was for 7 days by 50% of the private oral health-care practitioners, followed, followed by 36% for 5 days and 14% for 3 days shown in Figure 5.

In this descriptive survey, the questionnaire was also on the preferred and nonpreferred prescription of antimicrobial drugs in periodontal infections. It was found that 100% of the private practitioners prescribe the antimicrobial drugs in a periodontal abscess, followed by 94% in aggressive periodontitis and 90% in periodontitis with systemic disease shown in Figure 7. Private oral health-care practitioners of Mandi, Himachal Pradesh, do not prefer to prescribe the antimicrobial drug in the gingival disease, 93%, followed by 90% in chronic periodontitis and 19% in necrotizing ulcerative gingivitis shown in Figure 8.

In the present study, the drug of the first choice in patients with an allergy to penicillin was found to be azithromycin (56%), followed by ciprofloxacin (30%) and clindamycin (14%), shown in Figure 6. Clindamycin is an anti microbial drug, active against Gram-positive cocci, including many penicillin-resistant staphylococci and anaerobic species, and may be helpful in the treatment of patients who do not respond to conventional treatments consisting of scaling and root planing and surgery.[8,10]

In contrast to the results of the present study, erythromycin was not prescribed, and clindamycin 23% was least prescribed drug by private oral health care practitioners in penicillin allergic patients of Mandi, Himachal Pradesh, while in European countries 53% dentist prescribe erythromycin as first choice drug,[9] 53% and 21.2% in the USA[9,11] and in Spain was (63.2% and 65.4%).[12-14] Other antimicrobial drugs prescribed for patients with an allergy to penicillins were azithromycin (22%) and clindamycin (19%).

Systemically administered metronidazole with amoxicillin -clavulanic acid and in a combination with mechanical therapy (scaling and root planing) will lead to a beneficial change in the composition of the subgingival microbiota by reducing pathogens[15-19] and allowing the growth of host-compatible species, and a promising result in chronic periodontitis has been demonstrated in the published literature [Figures 7 and 8].

It is well known that the factors leading to the prevalence and global increase of antimicrobial drugs resistance are the prescribing antimicrobial drugs by oral health-care practitioners even in the absence of sufficient indications, due to diagnostic uncertainty, their lack of information about effective therapies, and patient demand.[20-23]

CONCLUSION

The present survey showed that most of the respondents have ample awareness of usage and prescription of antimicrobial drugs and recognize that nonprescription of antimicrobial drugs can impact both of them as private oral health care and the treating patients of periodontal infections. Coordinated intervention at the national and regional levels, including judicious antimicrobial drugs prescription and adequate patient care, is needed to reduce the spread of resistant bacteria through improper use of antimicrobial drugs in periodontal infections. It is essential to understand the past and present medical history of the patients concerning drug reactions and current prescriptions. Patients should be well informed of potential adverse effects and reactions of

antimicrobial drugs that can arise following the treatment of periodontal infections.

Limitations

This survey has several limitations due to amenity hindrance; at last self-reported data always come with limitations. However, we recommend that future researches and surveys should be carried out with a durable study design in mind.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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