

Antibiotic Prescription for Periodontal Therapy: A Survey of Current Trends in Jammu Region

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ABSTRACT

INTRODUCTION: Systemic antibiotics in conjunction with scaling and root planning (SRP) can offer an additional benefit over SRP alone in treating periodontitis regarding clinical attachment loss (CAL) and pocket depth change. Dental practitioners, however, have a varied pattern regarding antibiotic Prescription among periodontal patients.

OBJECTIVE: The present study was, therefore, conducted to evaluate current trends in antibiotic therapy concerning periodontal disease among dental practitioners in the Jammu region.

METHODOLOGY: A questionnaire of 17 questions was disseminated to 300 dental practitioners in Jammu through web and mobile-based social networks. The collected data were tabulated, and statistical analysis was done.

RESULTS: Of 300 dental practitioners included in the study, 185 responded (45- no response and 70- half filled, thus excluded). Results show the following trends:

▣ Combination therapy preferred over monotherapy and local drug delivery (LDD)

▣ Periodontists lead the use of LDD among dental practitioners.

▣ Antibiotic resistance is a growing concern.

Lack of knowledge about the newer formulations and drug delivery systems.

CONCLUSION: Antibiotic therapy's role in managing periodontal patients cannot be denied. Still, there is a definite need to improve the awareness of dental practitioners, particularly in the aspects of newer delivery systems and formulations.

KEYWORDS: Antibiotics, Dentist, Periodontal disease, Prescription.

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INTRODUCTION

Periodontitis is an infection caused by bacteria residing in the biofilms at or below the gingival margin. Periodontal treatment aims to eliminate the pathogens associated with the disease process and attain periodontal health. Mechanical debridement as scaling and root planning has been the gold standard of periodontal disease treatment. However, there are fewer limitations:

- Difficulty in accessing areas such as furcations, grooves, concavities, and tortuous pockets.¹
- It may eliminate sub-gingival rectus but is ineffectual against *P. gingivalis*, *Prevotella intermedia*, *T. forsythus*, *Peptostreptococcus*, and enteric rods²
- Less effective against *actinomycetemcomitans* or *P.*

gingivalis, which can invade periodontal tissues.³

Given the infectious nature of periodontal diseases and the limited efficacy of conventional mechanical therapy, antibiotics must be used with traditional mechanical therapy to improve clinical outcomes in cases such as aggressive periodontitis, necrotizing periodontal diseases, periodontal abscess, and progressive breakdown despite conventional mechanical treatment⁴. Antibiotics enter the periodontal tissues via the serum and prevent pathogen recolonization by suppressing periodontal pathogens on the tongue or other oral surfaces.^{5,6} Localized or site-specific antibiotic

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administration may provide the benefit of treating specific disease sites, using lower total dosage levels, and possibly avoiding systemic complications associated with high dosage levels.

According to recent surveys, dentists in India prescribe antibiotics to periodontal patients in various ways^{7,8}. The choice of antibiotics is still being determined, and they are likely case-dependent. Numerous studies on antibiotic prescription patterns have been conducted. However, there needs to be more information available about these practices and the use of locally delivered antibiotics among dental practitioners in northern India. Therefore, the present study was conducted to investigate current antibiotic prescription trends concerning periodontal patients among dental practitioners in the Jammu region.

METHODOLOGY

The current cross-sectional study was carried out to ascertain the antibiotic prescribing practices of dentists in Jammu. Three hundred dentists actively treating dental patients in various public and private hospitals were invited to participate in this study. The dentists were given a self-administered questionnaire with 17 questions. The majority of the questions were closed-ended. The questionnaires were distributed to dentists through a web-based and mobile-based social network. Dentists were reminded telephonically every week for a week, and the completed questionnaire was retrieved. The questionnaire was completed by 255 of the 300 dentists. However, 70 of the 255 questionnaires were half-completed and thus excluded from the study. Aside from demographic information, a questionnaire with multiple choices concerning the antibiotic regimen was developed:

QUESTIONNAIRE

SECTION-1

1. Participation in this survey is completely voluntary. I agree to participate in this survey and understand that the responses may be recorded for research purposes

Accept ☐

Decline ☐

2. Gender: Male ☐

Female ☐

3. Qualification: BDS ☐

MDS ☐

4. Speciality: General dentist ☐

Periodontist ☐

Others ☐

SECTION-2

1 How often do you write prescriptions for antibiotics for patients with periodontal disease?

Daily ☐

Weekly ☐

Monthly ☐

Never ☐

2 Do you write antibiotics after scaling and root planning?

Yes ☐

No ☐

3. Do you write antibiotics after surgical procedure/ periodontal surgery?

Yes ☐

No ☐

4. Do you take a medical history of patients before prescribing antibiotics?

Yes ☐

No ☐

5. Do you prefer prescribing antibiotics to pregnant women?

Yes ☐

No ☐

6. Most commonly you prescribe antibiotics as

Individual formulations ☐

Combination ☐

7. The average no. of days you prescribe antibiotics for?

3 days ☐

5 days ☐

7 days ☐

8. What factors do you consider for prescribing antibiotics?

Popularity of brand ☐

Availability of brand ☐

Affordability ☐

9. Do you come across patient reporting side effects of the

antibiotics prescribed?

Yes ☐

No ☐

10. Do you use local drug delivery agents in your practice?

Yes ☐

No ☐

11. Do you prefer use of local drug delivery agents as compared to systemic drugs in your practice?

Yes ☐

No ☐

12. Do you commonly find patients who already have taken antibiotics before coming to you in your practice?

Yes ☐

No ☐

13. Antibiotics taken by patients prior to the visit to dental office are

On prescription ☐

Self-administered ☐

14. Do you believe antibiotics are not used judiciously in dental practice?

Yes ☐

No ☐

15. Whether antibiotic resistance is of growing concern?

Yes ☐

No ☐

16. Do you advice antibiotic sensitivity test for your patients in your practice?

Yes ☐

No ☐

17. Do you prefer antibiotics?

As last resort ☐

As first preference compared to conventional treatment ☐

STATISTICAL ANALYSIS

The collected data were numerically coded, entered into the database, and analysed using cross-section descriptive statistics. The Chi-square test was used to assess the significance of the difference in the proportion of responses with $p < 0.05$ was considered statistically significant.

RESULTS

Seventeen pretested closed-ended questions were compiled and sent to 300 dental practitioners, of which only 185 responded. The questionnaires with less than 90% completed answers were excluded from the study. Of the 185 dental practitioners participating, 81.1% were BDS and 18.9% were MDS, 30.6% were males, and 69.4% were females participated in the study. In the specialists' group, 77.2% were general dentists, 10% were Periodontists, and the remaining included other specialities.

Table-1: Information of the participants/dental professionals

S.no	Variables	Frequency	Percentage
1	Sex	Male	53
		Female	125
2	Qualification	BDS	146
		MDS	32
3	Speciality	General dentist	139
		Periodontist	18
		Others	19

Table-2: Responses to questions 1-17

	Questions	Variables	Frequency	Percentage
1	How often do you write prescriptions for antibiotics for patients with periodontal disease?	Daily	66	38
		Weekly	74	43.1
		Monthly	31	17.2
		Never	3	1.7
2	Do you write antibiotics after scaling and root planing?	Yes	67	37.2
		No	111	63
3	Do you write antibiotics after surgical procedure/periodontal surgery?	Yes	173	96.1
		No	3	3.9
4	Do you prefer prescribing antibiotics to pregnant women?	Yes	50	29
		No	128	71
5	Do you take a medical history of patients before prescribing antibiotics?	Yes	174	96.7
		No	4	2.9
6	Most commonly you prescribe antibiotics as	Individual formulations	58	33.9
		Combination	119	66.1
7	The average no. Of days you prescribe antibiotics for	3 days	98	54.4
		5 days	68	39.9
		7 days	12	6.7
8	What factors do you consider for prescribing antibiotics?	Popularity of brand	39	22.8
		Availability of brand	52	28.9
		Affordability	87	48.3
9	Do you come across patients reporting side effects of the antibiotics prescribed	Yes	98	60.5
		No	78	43.3

10	Do you use local drug delivery agents in your practice	Yes	109	39.4
		No	64	60.6
11	Do you prefer the use of local drug delivery agents as compared to systemic drugs in your practice	Yes	95	52.8
		No	78	47.2
12	Do you commonly find patients who already have taken antibiotics before coming to you in your practice	Yes	143	79.4
		No	30	20.6
13	Antibiotics taken by patients prior to visit to the dental office are	On prescription	76	43.3
		Self-administered	102	56.7
14	Do you believe antibiotics are not used judiciously in dental practice	Yes	83	46.1
		No	89	53.9
15	Whether antibiotic resistance is of growing concern	Yes	83	50.6
		No	89	49.4
17	Do you advise for antibiotic sensitivity tests for your patients in your practice	Yes	88	51.1
		No	88	48.9
18	Do you prefer antibiotics	As last resort	87	48.3
		As the first preference to Conventional therapy	87	51.7

S.No		Variables	Yes	No	P value
1	Do you write antibiotics after scaling and root planning?	General Dentists	57	86	.055 (Significant)
		Periodontist	3	18	
		Others	9	12	
2	Do you write antibiotics after surgical procedure/periodontal surgery?	General Dentists	139	1	.007 (Close to significant)
		Periodontist	20	0	
		Others	20	5	
3	Do you prefer prescribing antibiotics to pregnant women?	General Dentists	45	98	.794
		Periodontist	7	15	
		Others	5	15	
4	Do you take a medical history of patients before prescribing antibiotics?	General Dentists	138	8	.580
		Periodontist	20	0	
		Others	19	0	
5	Do you come across patient reporting side effects of the antibiotics prescribed	General Dentists	79	65	.285
		Periodontist	17	5	
		Others	9	10	
6	Do you favour use of local drug delivery agents in your practice	General Dentists	85	60	.085
		Periodontist	17	4	
		Others	15	4	

7	Do you prefer use of local drug delivery agents as compared to systemic drugs in your practice	General Dentists	78	66	.221
		Periodontist	15	8	
		Others	8	10	
8	Do you commonly find patients who already have taken antibiotics before coming to you in your practice	General Dentists	111	29	.850
		Periodontist	19	4	
		Others	19	3	
9	Do you believe antibiotics are not used judiciously in dental practice	General Dentists	70	81	.636
		Periodontist	7	8	
		Others	11	8	
10	Whether antibiotic resistance is of growing concern	General Dentists	139	5	.057
		Periodontist	17	2	
		Others	118	4	
11	Do you advice for antibiotic sensitivity test for your patients in your practice	General Dentists	77	66	.138
		Periodontist	8	15	
		Others	10	9	

Within the constraints of the current study, descriptive statistics were used to represent each response category, and kappa statistics were used to assess the reliability of the initial cohort. The Chi-square test, which was used to assess the significance of the difference in the proportion of responses, revealed that statistically significant differences were observed in questions 1,2,12 and 14 with $p < 0.05$ being statistically significant. Dental practitioners prefer to prescribe combination antibiotics after periodontal surgical procedures, but there is a clear need for increased awareness and knowledge of newer formulations, as well as standardized antibiotic regimen use.

DISCUSSION

Dental caries, pulpal necrosis, trauma, and periodontal diseases can result in dental infections, which could have severe consequences that affect the oral cavity's soft and hard tissues. Antibiotics are generally used in dental procedures to treat odontogenic and non-odontogenic infections, focal infections, and prevention.⁹

In managing periodontitis, adjunctive use of antibiotics,

either locally or systemically, can enhance the effect of mechanical therapy.¹⁰ Prabhu et al., 2014¹¹ suggested that antibiotics are beneficial for treating periodontal disease when adequately used. Antibiotics can alter the flora of the plaque, reduce gingivitis, and slow bone resorption. Still, they must penetrate deeply into the gingival sulcus and produce gingival fluid concentrations more remarkable than the minimum inhibitory concentrations (MIC) of the suspected pathogens to treat periodontitis effectively.

A high dose leads to toxicity, gastrointestinal intolerance, drug resistance, and supplementary infections^{12, 13, 14}. Patients with periodontal disease benefit significantly from antibiotics, but their use must be rationalized owing to their side effects. It has been noted that only about 12% of dentists adequately and correctly prescribe antibiotics, which shows the importance of comprehensive guidelines.⁹

The results of the present study show that antibiotic prescriptions in periodontal patients vary depending on whether general dental practitioners or specialists prescribe them. Following a thorough medical history, most dental practitioners (96%) write antibiotics after surgical procedures/periodontal surgery. The self-administration of medications by patients is a contributing factor to the rise in antibiotic resistance, according to 93% of respondents. The most frequent and vital factors are recommendations from friends and family and television, radio, and print advertisements. Another significant reason people turn to self-medication is the expensive healthcare system.¹⁵ Antibiotic resistance is a growing concern for 93% of respondents. Most patients who visit dentists for advice have already taken antibiotics, with 79% of those medications being self-administered by the patients. Some people are not financially stable and cannot pay the consultation fees. In contrast, others feel that going to a dental office or hospital is unnecessary if the condition is not severe and should be avoided.

To ensure the selection of the most effective drug therapy, it may also be advisable to perform antibiotic sensitivity testing and microbial culture, which will help to identify the bacteria that are susceptible to antibiotics¹⁶

Local drug delivery (LDD) is a relatively dependable and efficient method. It uses comparatively less medication overall and achieves higher concentrations at the intended

site of action, thus reducing the side effects associated with systemic, systemic antibiotics.¹⁷ This study showed that 60% of clinicians favour using local drug delivery agents compared to systemic antimicrobials, but most practitioners are Periodontists. This may be due to a need for more knowledge about local drug delivery systems among general practitioners or difficulty in the availability of these delivery systems. Locally delivered drugs are a good solution for treating periodontitis and work on improving carriers, and the use of medicinal substances should be continued. When considering the adjunctive use of these products, clinicians should also consider other factors, such as the price of preparations, ease of handling, and the time employed in its application, all potentially influencing the overall efficiency of these therapies. Many factors can affect the selection of antibiotics, but in this study, affordability is a significant determinant. The biggest challenge is educating the dentist and people about antibiotics and their side effects and encouraging them to stop their misuse.

As a result, it has proved worthwhile to study the current trends regarding antibiotic use amongst dental practitioners in Jammu.

CONCLUSION

The adjunctive use of antimicrobials as a part of the therapy in managing periodontal diseases has been accepted for decades. Still, the irrational use of antibiotics leads to adverse outcomes like drug toxicity, bacterial resistance, superinfection, and drug interaction demanding the need to rationalize their use. Therefore, local drug-delivery antibiotics have emerged to restore periodontal health. Furthermore, the timing of growing interest in this field coincides with the need to augment or replace antibiotics whose side effects are undesirable and whose efficacy is diminishing due to drug resistance. Therefore, to avoid the harmful side effects of antibiotics, administering local drug delivery systems can be a valuable alternative in treating patients with periodontitis.

To prevent these problems, antibiotics should be prescribed in a narrow spectrum and be limited to acute infections. Moreover, further education and investigation should be conducted to avoid and reduce the problem of antibiotic resistance.

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