

ORIGINAL RESEARCH

Role of tetracycline fibres in chronic periodontitis patients

Dr. Salabh Soni

Assistant Professor, Department of Dentistry, Rama Medical College Hospital & Research Centre, Hapur, Uttar Pradesh, India

Corresponding author

Dr. Salabh Soni

Assistant Professor, Department of Dentistry, Rama Medical College Hospital & Research Centre, Hapur, Uttar Pradesh, India

Received date: 18 August, 2022

Acceptance date: 20 September, 2022

ABSTRACT

Background: Periodontal disease is an inflammatory condition affecting the tissues that support teeth. It is brought on by a variety of microorganisms and causes the alveolar bone and periodontal ligament to gradually deteriorate, either via recession or pocket development. The present study was conducted to evaluate role of tetracycline fibres in chronic periodontitis patients. **Materials & Methods:** 60 patients of chronic periodontitis of both genders were divided into 2 groups of 30 each. Group I underwent scaling and root planning and group II patients underwent scaling and root planning followed by local application of tetracycline gel. Parameters such as plaque index, gingival index and probing pocket depth at 1 month, 3 months and 6 months. **Results:** Group I had 12 males and 18 females and group II had 17 males and 13 females. The mean probing pocket depth at 1 month was 1.54 and 1.25, at 3 months was 1.50 and 1.42 and at 6 months was 1.44 and 1.28 in group I and II respectively. The mean plaque index 1 month was 0.57 and 0.45, at 3 months was 0.75 and 0.57 and at 6 months was 0.79 and 0.63 in group I and II respectively. The mean gingival index was 0.45 and 0.33 at 1 month, 0.57 and 0.45 at 3 months and 0.73 and 0.61 at 6 months in group I and II respectively. The difference was significant ($P < 0.05$). **Conclusion:** When tetracycline was used as an adjuvant to SRP, individuals with periodontitis show improved clinical parameters compared to SRP alone.

Key words: Periodontitis, Scaling and root planning, Tetracycline

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution- Non Commercial-Share Alike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

INTRODUCTION

Periodontal disease is an inflammatory condition affecting the tissues that support teeth. It is brought on by a variety of microorganisms and causes the alveolar bone and periodontal ligament to gradually deteriorate, either via recession or pocket development.¹ Alveolar bone resorption and permanent bone loss are the results of the host defense system's aggravating cytokine and mediator production. A major objective of periodontal therapy is to eradicate these infections, therefore stopping the progression of the disease.² Research has demonstrated that the majority of periodontal disorders respond predictably to traditional non-surgical therapy, such as scaling and root planing (SRP), and that long-term health may be sustained with appropriate maintenance care regimens.³

Even in well-maintained patients, recurrence of disease in particular places is not uncommon due to poor oral hygiene and bacterial infection, despite the fact that this acknowledged and established technique offers many patients long-term stability.⁴ Antimicrobial drugs, both local and systemic, are

employed in addition to mechanical therapy. Different local drug delivery systems containing chemotherapeutic agents have been designed to address the inadequacies of systemic antimicrobials.⁵ These methods are being utilized to transport the agents to the base of the pocket, hence limiting their detrimental effects on non-oral body sites. Owing to its exceptional capacity to decrease collagenous matrix degradation by blocking matrix metalloproteinases (MMPs), tetracycline has been utilized in the treatment of periodontal disease.⁶ The present study was conducted to evaluate role of tetracycline fibres in chronic periodontitis patients.

MATERIALS & METHODS

The present study was conducted on 60 patients of chronic periodontitis of both genders. All patients gave their written consent to participate in the study. Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups of 30 each. Group I underwent scaling and root planning and group II patients underwent scaling and root planning followed by local application of tetracycline gel. Parameters

such as plaque index, gingival index and probing pocket depth at 1 month, 3 months and 6 months. Results thus obtained were subjected to statistical

analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Groups	Group I	Group II
Method	SRP	SRP+ tetracycline gel
M:F	12:18	17:13

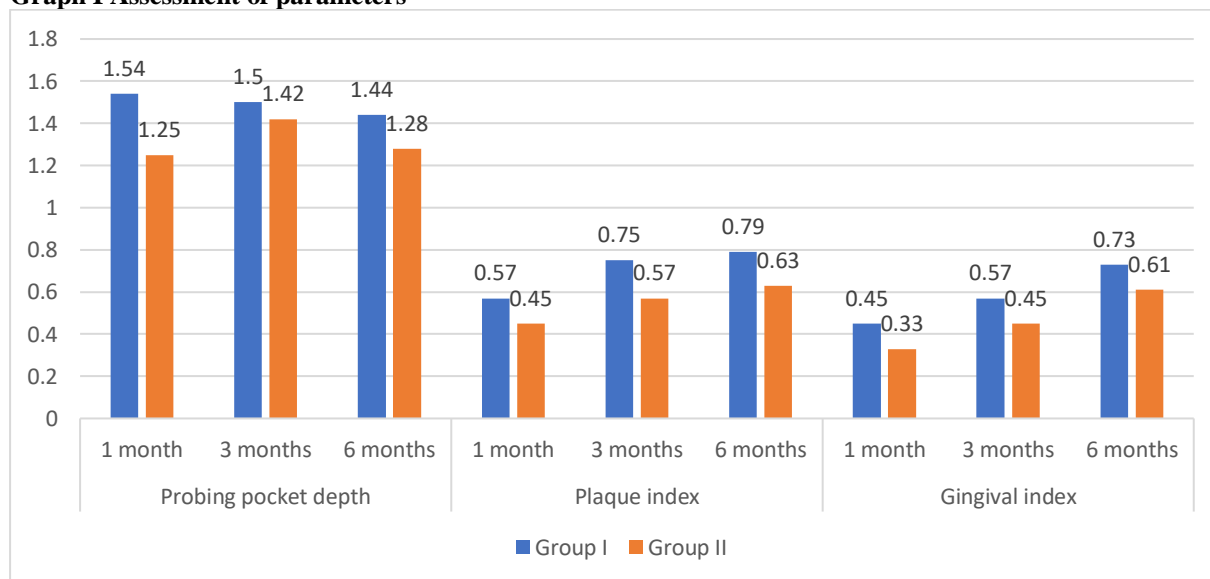
Table I shows that group I had 12 males and 18 females and group II had 17 males and 13 females.

Table II Assessment of parameters

Parameters	Duration	Group I	Group II	P value
Probing pocket depth	1 month	1.54	1.25	0.03
	3 months	1.50	1.42	
	6 months	1.44	1.28	
Plaque index	1 month	0.57	0.45	0.04
	3 months	0.75	0.57	
	6 months	0.79	0.63	
Gingival index	1 month	0.45	0.33	0.02
	3 months	0.57	0.45	
	6 months	0.73	0.61	

Table II, graph I shows that mean probing pocket depth at 1 month was 1.54 and 1.25, at 3 months was 1.50 and 1.42 and at 6 months was 1.44 and 1.28 in group I and II respectively. The mean plaque index 1 month was 0.57 and 0.45, at 3 months was 0.75 and 0.57 and at 6 months was 0.79 and 0.63 in group I and II respectively. The mean gingival index was 0.45 and 0.33 at 1 month, 0.57 and 0.45 at 3 months and 0.73 and 0.61 at 6 months in group I and II respectively. The difference was significant (P< 0.05).

Graph I Assessment of parameters



DISCUSSION

For the nonsurgical treatment of chronic periodontitis, scaling and root planning (SRP) is still the accepted gold standard. Nevertheless, the SRP is unable to enter periodontal pockets, which are a perfect habitat for the development and spread of anaerobic pathogenic bacteria.⁷ The primary organisms implicated in periodontitis include Porphyromonas gingivalis, Prevotella intermedia, and Actinobacillus actinomycetemcomitans. Gram-negative anaerobic or microaerophilic bacteria are the

pathogenic bacteria that cause periodontitis. One of the main objectives of periodontal therapy is to eradicate these infections in order to stop the disease from getting worse.⁸ These local medication delivery tools have been applied both independently and in conjunction with SRP. By targeting the infection site directly with these antimicrobial drugs, therapeutic levels can be established and sustained for several days to weeks. Because these antimicrobial medicines lower the pathogenic microbiota and modulate inflammatory responses, gingival inflammation is

likely reduced, contributing to their overall effectiveness.⁹

We observed that group I had 12 males and 18 females and group II had 17 males and 13 females. In order to treat chronic periodontitis sites in maintenance patients, Sadaf et al¹⁰ compared the effectiveness of scaling and root planing (SRP) alone vs tetracycline fiber therapy administered adjunctively with SRP. Thirty patients between the ages of thirty and fifty-five who had been diagnosed with chronic periodontitis (seen as sixty localized cases of the disease) were chosen. These patients all had clinically measured periodontal pocket sites ranging from 4 to 7 mm, radiographic evidence of substantial bone loss, and no history of surgical or non-surgical periodontal therapy. For monitoring purposes, two non-adjacent sites in different quadrants of each patient were chosen based on the assumption that the sites had localized chronic periodontitis. At baseline as well as on the 15th, 30th, 60th, and 90th day, the Plaque Index and the Gingival-bleeding Index were measured. At baseline and the ninetieth day, clinical pocket depth (PD) and microbiological analysis (MA) were examined. Adjunctive tetracycline fiber therapy significantly outperformed S and RP alone in decreasing PI and GBI at 0 and 3 months ($P < 0.001$). On the other hand, after 0 and 3 months, the decline in the PD was not statistically significant ($P < 0.001$). *Actinobacillus actinomycetemcomitans* did not significantly decrease, although *Porphyromonas gingivalis* and *Prevotella intermedia* did, according to the microbiological analysis.

We observed that mean probing pocket depth at 1 month was 1.54 and 1.25, at 3 months was 1.50 and 1.42 and at 6 months was 1.44 and 1.28 in group I and II respectively. The mean plaque index 1 month was 0.57 and 0.45, at 3 months was 0.75 and 0.57 and at 6 months was 0.79 and 0.63 in group I and II respectively. The mean gingival index was 0.45 and 0.33 at 1 month, 0.57 and 0.45 at 3 months and 0.73 and 0.61 at 6 months in group I and II respectively. Cattabriga et al¹¹ assessed the clinical response of 25 adult periodontal maintenance patients over a 6-month period to sustained-release tetracycline fibers either in combination with scaling and root planing or alone. There was at least one pocket ≥ 4.0 mm in every subject that needed therapy because it bled when prodded. For seven to twelve days, thirty-six teeth were treated with tetracycline fibers; twelve of the thirty-six teeth also underwent scaling and root planing. The teeth's condition was taken into consideration while choosing which teeth needed scaling and root planing. Changes in the depth and frequency of bleeding upon probing were used to assess the therapeutic outcomes. One month following treatment, the use of tetracycline fibers and fibers with scaling resulted in 1.8 and 1.7 mm decreases in probing depth, respectively; reductions fell to 1.3 and 0.8 mm after three months.

In their investigation, Manan et al¹² examined 60 locations from 30 patients with probing depths of more than 5 mm and less than 8 mm. Group II consisted of 30 control sites that received only scaling and root planing, while Group I consisted of 30 sites that received scaling and root planing followed by local application of tetracycline gel. For Group I, the mean gingival index reduction from day 0 to 90 was 0.68 ± 0.15 , while for Group II, it was 0.57 ± 0.22 . $P < 0.05$ indicated statistical significance for the values. For Group I and Group II, the mean reduction in probing pocket depth from day 0 to 90 was 1.47 ± 0.54 and 1.39 ± 0.49 , respectively.

CONCLUSION

Authors found that when tetracycline was used as an adjuvant to SRP, individuals with periodontitis show improved clinical parameters compared to SRP alone.

REFERENCES

1. Silverstein L, Bissada N, Manouchehr-Pour M, Greenwell H. Clinical and microbiologic effects of local tetracycline irrigation on periodontitis. *Journal of periodontology*. 1988;59(5):301-5.
2. Christersson LA, Norderyd OM, Puchalsky CS. Topical application of tetracycline-HCl in human periodontitis. *Journal of clinical periodontology*. 1993;20(2):88-95.
3. Wilson TG, McGuire MK, Greenstein G, Nunn M. Tetracycline fibers plus scaling and root planing versus scaling and root planing alone: similar results after 5 years. *J Periodontol*. 1997;68(11):1029-32.
4. Dang AB, Chaubey KK, Thakur RK, Mohan R, Chowdhary Z, Tripathi R. Comparative evaluation of efficacy of three treatment modalities – tetracycline fibers, scaling and root planing, and combination therapy: A clinical study. *Journal of Indian Society of Periodontology*. 2016;20(6):608-613.
5. Darhous MS, Zahran F, Ragy N. Bacteriological and clinical assessment of tetracycline as root conditioning in adjunct to periodontal surgery. *Egypt Dent J*. 1995;41(2):1167-78.
6. Heijl L, Dahlen G, Sundin Y, Wenander A, Goodson JM. A 4-quadrant comparative study of periodontal treatment using tetracycline-containing drug delivery fibers and scaling. *J Clin Periodontol*. 1991;18(2):111-6.
7. Goel A, Arora SA and Chhina S: Comparative Efficacy of 1% Alendronate Gel and Tetracycline Fibers as an Adjunct to Scaling and Root Planing: A Randomized Control Clinical Trial. *Int J Pharm Sci Res* 2016; 7(10): 4134-39.
8. Singh HP, Muzammil, Sathish G, Babu KN, Vinod KS, Rao HP. Comparative study to evaluate the effectiveness of Aloe vera and metronidazole in adjunct to scaling and root planing in periodontitis patients. *J Int Oral Health* 2016;8(3):374-377.
9. Michalowicz BS, Pihlstrom BL, Drisko CL, Cobb CM, Killooy WJ, Caton JG, et al. Evaluation of Periodontal Treatment Using Controlled Release Tetracycline Fibres: Maintenance Response. *J Periodontol*. 1995;66:708-15.
10. Sadaf N, Anoop B, Dakshina B, Shweta B. Evaluation of efficacy of tetracycline fibers in conjunction with scaling and root planing in patients with chronic

- periodontitis. Journal of Indian Society of Periodontology. 2012 Jul;16(3):392.
11. Cattabriga M, Pedrazzoli V, Cattabriga A, Pannuti E, Trapani M, Verrocchi GC. Tetracycline fiber used alone or with scaling and root planing in periodontal maintenance patients: Clinical results. Quintessence International. 1996;27(6):12-18.
 12. Manan Vyas, Seema Vyas. Assessment of tetracycline as an adjunct to scaling and root planing in periodontitis patients. International Journal of Contemporary Medicine Surgery and Radiology. 2018;3(1):126-128.