

ORIGINAL ARTICLE

LOCAL DRUG DELIVERY WITH TETRACYCLINE FIBRES: A CLINICAL STUDY

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ABSTRACT:

Background: Periodontal diseases are considered as infections of periodontium with a bacterial etiology, an immune response and subsequent tissue destruction. Putative pathogens associated with periodontal disease are susceptible to a variety of antiseptics and antibiotics. The present study was conducted to assess the tetracycline fibers in the management of periodontal infection. **Materials & Methods:** The study was conducted in the department of Periodontics in 2012. It included 40 patients of chronic periodontitis. Patients were divided into 2 groups. Group I (control group)- in which only scaling and root planing (SRP) was done. Group II (experimental group)- in which along with SRP, tetracycline fibers were used. Both premolars and molars were used for the study. Parameters such as probing depth and bleeding on probing (BOP) were recorded. The tetracycline fiber marketed as periodontal plus AB is available as vials with tetracycline impregnated collagen fibers. Tetracycline fibers are soaked in saline and packed into the periodontal pockets with a cotton forcep or curette until the pocket is filled upto or slightly below the gingival margin. Patients were instructed not to brush or floss the treated areas to avoid dislodging of the fiber and asked to use 0.2% chlorhexidine rinses twice a day. The including pocket depth were recorded on Day 0, 60 and 90 days in both the groups. **Results:** In group I, the number of sites with no BOP was 16 at day 30 and with BOP was 14. At day 90, sites with no BOP increased to 22 and sites with BOP decreased to 8. Similarly in group II, the number of sites with no BOP was 24 at day 30 and with BOP was 6. At day 90, sites with no BOP increased to 28 and sites with BOP decreased to 2. There was significantly reduced in bleeding sites in group II as compared to group I ($P < 0.05$). In group I, mean pocket depth at day 30 was 4.84 and at day 90 it reduced to 4.14. In group II, mean pocket depth at day 30 was 4.24 and at day 90 it reduced to 3.64. There was better reduction in probing depth in group II as compared to group I. **Conclusion:** Scaling and root planning is important step in prevention of periodontal break down. Local drug delivery is the effective method of controlling periodontitis. Tetracycline found to be beneficial in cases of periodontitis.

Key words: Root planning, Scaling, Tetracycline

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INTRODUCTION

Periodontal diseases are considered as infections of periodontium with a bacterial etiology, an immune response and subsequent tissue destruction. Putative pathogens associated with periodontal disease are susceptible to a variety of antiseptics and antibiotics. Antibacterial agents have been used along with mechanical debridement in the management of periodontal infection.¹ Methods employed to convey antimicrobial agents into periodontal pockets include rinsing, irrigation, systemic administration and local application using sustained and controlled delivery devices. The aim of periodontal therapy is the eradication of the plaque bacteria and to remove granulation tissue from the periodontal pockets for proper healing.² The drug delivery system delivers the antimicrobial agents to the base of the pocket at a bacteriostatic or bactericidal concentration. For the success, it should remain there in the pocket to ensure efficacious results.³ Since local drug

delivery can achieve the above requirements it is important to critically assess the ability of these treatment methods to attain or maintain periodontal health. The commonly used drug delivery systems are tetracycline fiber, metronidazole gel, chlorhexidine chip, minocycline gel and doxycycline polymer.⁴

The present study was conducted to assess the tetracycline fibers in the management of periodontal infection.

MATERIALS & METHODS

The study was conducted in the department of Periodontics in 2012. It included 40 patients of chronic periodontitis. Patients were informed regarding the study and written consent was taken. Patients were divided into 2 groups. Group I (control group)- in which only scaling and root planing (SRP) was done. Group II (experimental group)- in which along with SRP, tetracycline fibers were used. Both premolars and molars were used for the study. Parameters such as probing depth and bleeding on probing (BOP) were

recorded. The tetracycline fiber marketed as periodontal plus AB is available as vials with tetracycline impregnated collagen fibers.

Procedure:- Tetracycline fibers are soaked in saline and packed into the periodontal pockets with a cotton forcep or curette until the pocket is filled upto or slightly below the gingival margin. Patients were instructed not to brush or floss the treated areas to avoid dislodging of the fiber and asked to use 0.2% chlorhexidine rinses twice a day. The including pocket depth were recorded on Day 0, 60 and 90 days in both the groups. Results thus obtained were tabulated and subjected to statistical analysis using chi square test. P value less than 0.05 was considered significant.

RESULTS

Table I shows that patients were divided into 2 groups- group I (control) in which scaling and root planning was done and group II in which both SRP and tetracycline fibres were used. Each group comprised of equal number of males (10) and females (10). Table II shows that in group I, the number of sites with no BOP was 16 at day 30 and with BOP was 14. At day 90, sites with no BOP increased to 22 and sites with BOP decreased to 8. Similarly in group II, the number of sites with no BOP was 24 at day 30 and with BOP was 6. At day 90, sites with no BOP increased to 28 and sites with BOP decreased to 2. There was significantly reduced in bleeding sites in group II as compared to group I (P<0.05).

Graph I shows that in group I, mean pocket depth at day 30 was 4.84 and at day 90 it reduced to 4.14. In group II, mean pocket depth at day 30 was 4.24 and at day 90 it reduced to 3.64. There was better reduction in probing depth in group II as compared to group I.

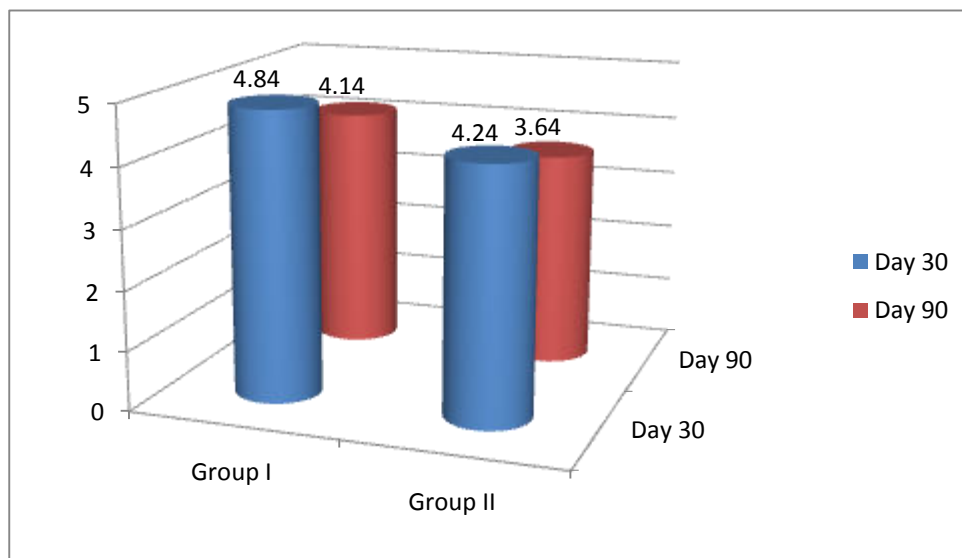
Table I Distribution of patients

Group I (control) (SRP)		Group II (experimental) (SRP+ Tetracycline)	
Male	Female	Male	Female
10	10	10	10

Table II Comparison of bleeding on probing in both groups

	Group I		Group II	
	Day 30	Day 90	Day 30	Day 90
Sites with no BOP	16	22	24	28
Sites with BOP	14	8	6	2

Graph I Comparison of pocket depth in both groups



DISCUSSION

Goodson et al (1979)⁵ first introduce local drug delivery. The periodic use of local delivery systems in reducing probing depths, stabilizing attachment levels and minimizing bleeding would allow better control of the disease. Several antibiotics have been incorporated as local drug delivery which can be delivered to the site in periodically. The present study was conducted to assess the efficacy of tetracycline fibers in the management of periodontal infection.

In our study, we included 40 patients of chronic periodontitis. Patients were divided into 2 groups. Group I (control group) in which only scaling and root planning (SRP) was done. Group II (experimental group) in which along with SRP, tetracycline fibers were used.

We evaluated bleeding on probing (BOP) around premolars and molars in both groups at day 30 and later on at day 90. In group I, the number of sites with no BOP was 16 at day 30 and with BOP was 14. At day 90, sites with no BOP increased to 22 and sites with BOP decreased to 8. Similarly in group II, the number of sites with no BOP was 24 at day 30 and with BOP was 6. At day 90, sites with no BOP increased to 28 and sites with BOP decreased to 2. There was significantly reduced in bleeding sites in group II as compared to group I. Our results are in agreement with the results obtained in the study of Pavia et al.⁶

Lindhe et al⁷ in his study demonstrated that use of tetracycline filled hollow fiber devices markedly changes the composition of the subgingival flora of initially diseased periodontal sites.

We also measured pocket depth in both groups. In group I, mean pocket depth at day 30 was 4.84 and at day 90 it reduced to 4.14. In group II, mean pocket depth at day 30 was 4.24 and at day 90 it reduced to 3.64. There was better reduction in probing depth in group II as compared to group I. Our results are in agreement with Thomas J Wilson et al.⁸ Similarly, Rodrigues⁹ in his study found that the use of tetracycline as a local drug delivery system is effective method of reducing periodontal diseases.

CONCLUSION

Scaling and root planning is important step in prevention of periodontal break down. Local drug delivery is the effective method of controlling periodontitis. Tetracycline found to be beneficial in cases of periodontitis.

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