

Journal of Advanced Medical and Dental Sciences Research

@Society of Scientific Research and Studies

Journal home page: www.jamdsr.com

doi: 10.21276/jamdsr

Index Copernicus value = 82.06

(e) ISSN Online: 2321-9599;

(p) ISSN Print: 2348-6805

Original Research

Tetracycline fibres as local drug delivery agent in chronic periodontitis

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ABSTRACT:

Background: The aim of periodontal therapy is the eradication of the plaque bacteria and to remove granulation tissue from the periodontal pockets for proper healing. The present study was conducted to evaluate use of tetracycline fibers in periodontal infection. **Materials & Methods:** The study was conducted on 60 patients of chronic periodontitis. Patients were divided into 2 groups. In group I only scaling and root planning (SRP) was done. In group II along with SRP, tetracycline fibers were used. In all patients, probing depth and bleeding on probing (BOP) were recorded. **Results:** In group I, the number of sites with no BOP was 14 at baseline and with BOP was 16. After 2 months, sites with no BOP increased to 18 and sites with BOP decreased to 12. In group II, the number of sites with no BOP was 20 at baseline and with BOP was 10. After 2 months, 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 baseline was 4.12 and after 2 months was 3.40. In group II, mean pocket depth at baseline was 4.60 and after 2 months was 3.12. The difference was statistically significant ($P < 0.05$). **Conclusion:** Authors found that local drug delivery is the effective method of controlling periodontitis. Tetracycline found to be effective in controlling periodontitis.

Key words: Periodontitis, Scaling, Tetracycline

Received: 26 October, 2019

Revised: 21 December, 2019

Accepted: 23 December, 2019

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This article may be cited as: Kaur M. Tetracycline fibres as local drug delivery agent in chronic periodontitis. J Adv Med Dent Res 2020;8(1):170-173.

INTRODUCTION

Periodontitis refers to gingival inflammation that damages the soft tissue and the supporting structure of the tooth. This further leads to the destruction of alveolar bone surrounding the teeth.

Periodontal flora plays the most important role in initiation and progression of periodontal diseases.¹ The presence of diverse microorganism renders the use of different antimicrobials in treatment of chronic periodontitis as an adjunct to mechanical debridement. Antibacterial agents have become an integral part of the therapeutic armamentarium, but systemic use of antibiotics is discouraged due to its side effects.²

The aim of periodontal therapy is the eradication of the plaque bacteria and to remove granulation tissue from

the periodontal pockets for proper healing.³ Success of any drug delivery system designed to target periodontal infections depend upon its ability to deliver the antimicrobial agents to the base of the pocket at a bacteriostatic or bactericidal concentration. It must also facilitate retention of the medicament long enough to ensure an efficacious results. 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.⁴

The drug delivery system delivers the antimicrobial agents to the base of the pocket at a bacteriostatic or bactericidal concentration. Tetracycline in different form holds great promise in controlling the progression of periodontal disease by their ability to reduce

microbial burden, to block collagenase activity, and to potentially inhibit bone loss.⁵ The present study was conducted to evaluate use of tetracycline fibers in periodontal infection.

MATERIALS & METHODS

Present study included 60 patients of chronic periodontitis. Patients were informed regarding the study and written consent was taken. Ethical clearance was obtained prior to the study. Data related to patients such as name, age, gender etc. was recorded. Patients were divided into 2 groups. In

group I only scaling and root planning (SRP) was done. In group II along with SRP, tetracycline fibers were used. In all patients, probing depth and bleeding on probing (BOP) were recorded. 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 pocket depth was recorded at baseline and after 2 months in both the groups. Results thus obtained were tabulated and subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Gender	Group I	Group II
	Scaling and root planning (SRP)	SRP+ Tetracycline
Male	18	16
Female	12	14

Table I shows that group I had 18 males and 12 females and group II had 16 males and 14 females.

Table II Bleeding on probing

Parameters	Group I		Group II	
	Baseline	After 2 months	Baseline	After 2 months
Sites with no BOP	14	18	20	28
Sites with BOP	16	12	10	2

Table II, graph I shows that in group I, the number of sites with no BOP was 14 at baseline and with BOP was 16. After 2 months, sites with no BOP increased to 18 and sites with BOP decreased to 12. In group II, the number of sites with no BOP was 20 at baseline and with BOP was 10. After 2 months, 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 Bleeding on probing

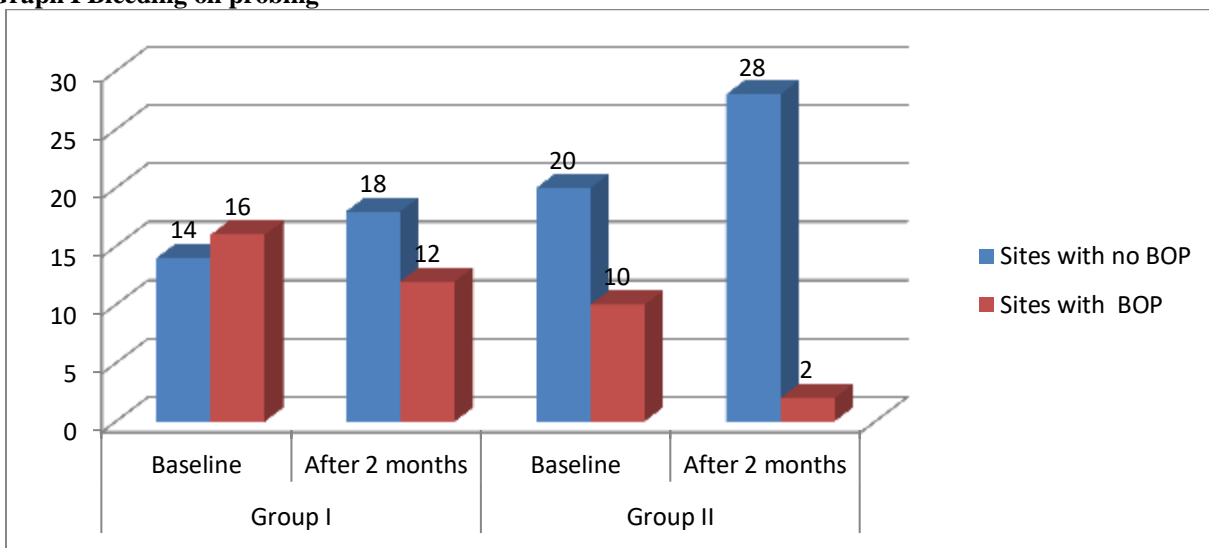
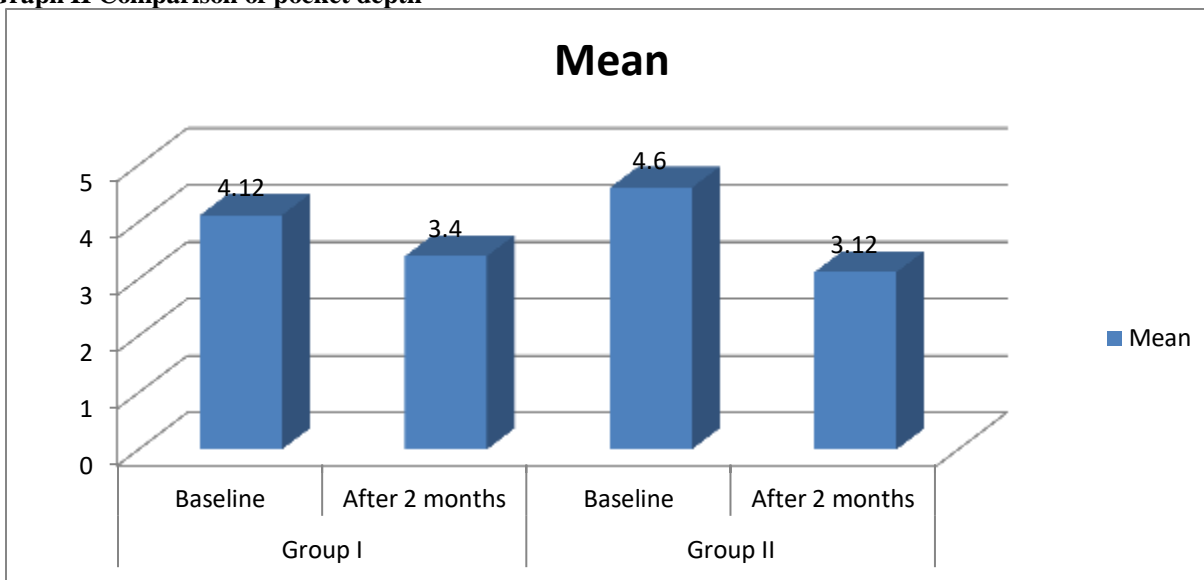


Table II Comparison of pocket depth

Parameters	Group I		Group II	
	Baseline	After 2 months	Baseline	After 2 months
Mean	4.12	3.40	4.60	3.12

Table III, graph II shows that in group I, mean pocket depth at baseline was 4.12 and after 2 months was 3.40. In group II, mean pocket depth at baseline was 4.60 and after 2 months was 3.12. The difference was statistically significant ($P < 0.05$).

Graph II Comparison of pocket depth



DISCUSSION

Chronic periodontitis is an infectious disease resulting from inflammation within the supporting tissues of the teeth characterized by progressive attachment and bone loss. It is the most common form of periodontitis which is associated with an accumulation of plaque and calculus with slow to moderate rates of disease progression.⁶ There is growing interest in localized antimicrobial therapy because of the site-specific nature of periodontal infections, greater subgingival concentrations of antimicrobial agent, and reduced side-effects compared to systemic antibiotics.⁷ The present study was conducted to evaluate use of tetracycline fibers in periodontal infection.

In our study, we included 60 patients of chronic periodontitis. Patients were divided into 2 groups. In group I only scaling and root planning (SRP) was done. Group II in which along with SRP, tetracycline fibers were used.

Goodson et al⁸ investigated the effect of tetracycline group of antibiotics as local drug delivery agents in chronic periodontitis. Ten relevant articles were selected for the metaanalysis, of which five articles were retrieved after electronic search, three articles were included after hand search, and two unpublished articles were included. The number of patients in

studies ranged from 13 to 140 sites with mean age ranging from 20 to 75. A total of 588 sites were treated using tetracycline group of antibiotics as local drug delivery agents in the treatment of chronic periodontitis. The metaanalysis showed standard difference in mean -1.02 mm for clinical gain in attachment in favor of tetracycline group. Standard difference in mean for probing depth (PD) was 1.20 mm in tetracycline group. Group I had 18 males and 12 females and group II had 16 males and 14 females. In group I, the number of sites with no BOP was 14 at baseline and with BOP was 16. After 2 months, sites with no BOP increased to 18 and sites with BOP decreased to 12. In group II, the number of sites with no BOP was 20 at baseline and with BOP was 10. After 2 months, 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 ($P < 0.05$).

Mittal et al⁹ 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 found that in group I, mean pocket depth at baseline was 4.12 and after 2 months was 3.40. In group II, mean pocket depth at baseline was 4.60 and after 2 months was 3.12.

Gupta et al¹⁰ conducted a case-control study on 30 patients suffering from chronic periodontitis. In Group A only scaling and root planning was carried out whereas in Group B tetracycline fibers were used along with scaling and root planning. Tetracycline fibers as an adjunct to scaling and root planning were found to be more effective in reducing inflammation. The number of sites with bleeding on probing was 12 in Group A as compared to four in Group B after 30 days. The mean decrease in probing depth was more in Group B than Group A after 30 and 90 days. General linear model showed that decrease in probing depth was statistically significant with both mechanical therapy as well as adjunctive use of tetracycline fibers.

CONCLUSION

Authors found that local drug delivery is the effective method of controlling periodontitis. Tetracycline found to be effective in controlling periodontitis.

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