Assessment of role of tetracycline fibres in chronic periodontitis patients

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Abstract---Background: Tetracycline has been used to treat periodontal disease due to its unique ability to reduce degeneration of collagenous matrix. The present study was conducted to assess role of tetracycline fibres in adjunct to scaling and root planning. Materials & Methods: 40 patients of chronic periodontitis were divided into 2 groups pf 40 each. Group I underwent scaling and root planning whereas group II patients underwent scaling and root planning followed by local application of tetracycline gel. Patients were recalled regularly at 1 month, 3 months and 6 months to assess plaque index, gingival index and Probing pocket depth. Results: The mean plaque index 1 month was 0.54 and 0.42, at 3 months was 0.72 and 0.54 and at 6 months was 0.76 and 0.60 in group I and II respectively. Gingival index was 0.44 and 0.28 at 1 month, 0.52 and 0.40 at 3 months and 0.68 and 0.56 at 9 months in group I and II respectively. Probing pocket depth at 1 month was 1.50 and 1.20, at 3 months was

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1.46 and 1.38 and at 6 months was 1.40 and 1.24 in group I and II respectively. The difference was significant (P< 0.05). Conclusion: Clinical parameters in periodontitis patients were improved with tetracycline in adjunct to SRP improves as compared to SRP alone.

Keywords---periodontitis, plaque index, gingival index, scaling, root planning.

Introduction

Periodontal disease is an inflammatory disease of the supporting tissues of teeth caused by an array of microorganisms, resulting in progressive destruction of periodontal ligament and alveolar bone with pocket formation, recession or both. The host defence system aggravates production of cytokines and other mediators which progresses towards alveolar bone resorption and irreversible bone loss.[1] Eliminating these infections, thereby preventing disease progression, is a primary goal of periodontal therapy. Studies have revealed that most forms of periodontal diseases are treated predictably by conventional non-surgical therapy like plaque control, scaling and root planing (SRP) and health can be maintained for a long period of time with proper maintenance care programs.[2] Although this recognized and accepted approach provides long-term stability for many patients, recurrence of disease in individual sites is not uncommon, even in well-maintained patient due to poor oral hygiene and bacterial infection.[3] Local and systemic antimicrobial agents are used as adjunct to mechanical therapy. To overcome the shortcomings of systemic antimicrobials, various local drug delivery systems with chemotherapeutic agents have been introduced and are being used to deliver these agents to the base of the pocket, thus minimizing the adverse impact on non-oral body sites.[4] Tetracycline has been used to treat periodontal disease due to its unique ability to reduce degeneration of collagenous matrix by inhibiting to reduce degradation of collagenous matrix by inhibiting the matrix metallo proteinases (MMPs).[5] The present study was conducted to assess role of tetracycline fibres in adjunct to scaling and root planning.

Materials and Methods

The present study was conducted among 40 patients of chronic periodontitis of both genders. All patients had probing depth measuring > 5 mm and < 8 mm. Patients who have not undergone any form of periodontal treatment for the last 6 months were enrolled. Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups pf 40 each. Group I underwent scaling and root planning whereas group II patients underwent scaling and root planning followed by local application of tetracycline gel. Patients were recalled regularly at 1 month, 3 months and 6 months to assess plaque index, gingival index and Probing pocket depth. 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	12:8	7:13

Table I shows that there were 12 males and 8 females in group I and 7 males and 13 females in group II.

Table II
Assessment of parameters

Parameters	Duration	Group I	Group II	P value
Plaque index	1 month	0.54	0.42	0.02
	3 months	0.72	0.54	
	6 months	0.76	0.60	
Gingival index	1 month	0.44	0.28	0.01
	3 months	0.52	0.40	
	6 months	0.68	0.56	
Probing pocket depth	1 month	1.50	1.20	0.04
	3 months	1.46	1.38	
	6 months	1.40	1.24	

Table II, graph I shows that mean plaque index 1 month was 0.54 and 0.42, at 3 months was 0.72 and 0.54 and at 6 months was 0.76 and 0.60 in group I and II respectively. Gingival index was 0.44 and 0.28 at 1 month, 0.52 and 0.40 at 3 months and 0.68 and 0.56 at 9 months in group I and II respectively. Probing pocket depth at 1 month was 1.50 and 1.20, at 3 months was 1.46 and 1.38 and at 6 months was 1.40 and 1.24 in group I and II respectively. The difference was significant ($P< 0.05$).
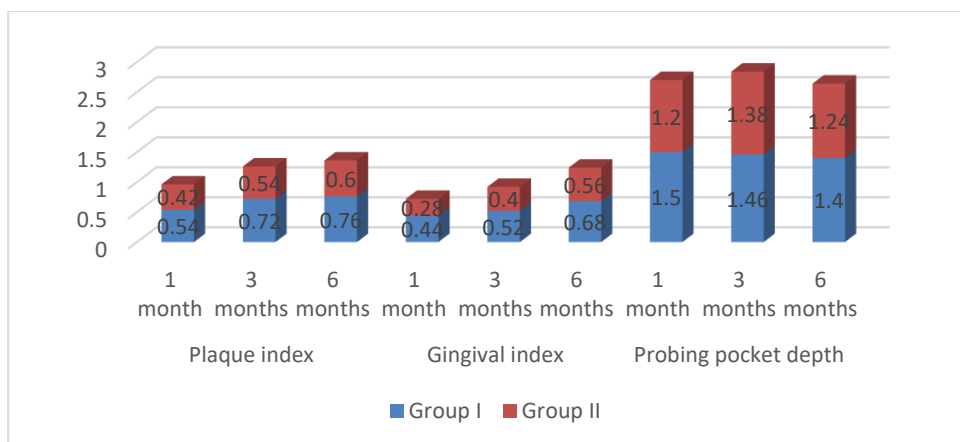
Graph I. Assessment of parameters

Discussion

The conventional treatment method of scaling and root planning (SRP) remains the gold standard for the nonsurgical management of chronic periodontitis.[6] However, access to periodontal pockets cannot be achieved through the SRP and these pockets provide an ideal environment for the growth and proliferation of anaerobic pathogenic bacteria.[7] The pathogenic bacteria that cause periodontitis are mainly gram-negative anaerobic or microaerophillic bacteria and the main organisms implicated are Actinobacillus actinomycetemcomitans, Porphyromonas gingivalis, and Prevotella intermedia. Eliminating these infections, thereby preventing disease progression, is a primary goal of periodontal therapy.[8] These local drug delivery devices have been used either alone or as adjunct with SRP. These antimicrobial agents are aimed directly into the site of infection, and therapeutic levels can be established and maintained for days to weeks using this approach.[9] The total effectiveness of these antimicrobial agents is probably due to a decrease in gingival inflammation by modulating the inflammatory responses and suppression of the pathogenic microbiota.[10] The present study was conducted to assess role of tetracycline fibres in adjunct to scaling and root planning.

In present study there were 12 males and 8 females in group I and 7 males and 13 females in group II. Manan et al[11] in their study a total of 60 sites from 30 patients with probing depth measuring > 5 mm and < 8 mm. Group I comprised of 30 sites which was treated with scaling and root planning followed by local application of tetracycline gel and group II comprised of 30 control sites that were only treated with scaling and root planning. The mean reduction in the gingival index from day 0 to 90 for Group I was 0.68±0.15 and for Group II was 0.57±0.22. The values were statistically significant ($P < 0.05$). The mean reduction in probing pocket depth from day 0 to 90 for Group I was 1.47±0.54 and for Group II was 1.39±0.49. The values were statistically significant ($P < 0.05$). We observed that mean plaque index 1 month was 0.54 and 0.42, at 3 months was 0.72 and 0.54 and at 6 months was 0.76 and 0.60 in group I and II respectively. Gingival index was 0.44 and 0.28 at 1 month, 0.52 and 0.40 at 3 months and 0.68 and 0.56 at 9 months in group I and II respectively. Probing pocket depth at 1 month was 1.50 and 1.20, at 3 months was 1.46 and 1.38 and at 6 months was 1.40 and 1.24 in group I and II respectively.

Sadaf et al[12] compared the efficacy of scaling and root planing (SRP) alone versus tetracycline fiber therapy used adjunctively with SRP in the treatment of chronic periodontitis sites in maintenance patients. A total of 30 patients with a diagnosis of chronic periodontitis (60 localized chronic periodontitis sites) in the age group of 35 to 55 were selected. None of these patients had received any surgical or non-surgical periodontal therapy and had sites of periodontal pockets measuring 4—7 mm clinically and demonstrated radiographic evidence of moderate bone loss. Two non-adjacent sites in separate quadrants were selected in each patient for monitoring based on criteria that the sites had localized chronic periodontitis. Plaque index (PI) (sillness and loe) and Gingival-bleeding index (GI) (loe and sillness) were measured at baseline and 15th, 30th, 60th, and 90thday. Clinical pocket depth (PD) and microbial analysis (MA) were analyzed at baseline and 90th day. At 0 and 3 months adjunctive tetracycline fiber therapy was significantly

better in reducing PI, GBI, (P<0.001) than S and RP alone. In comparison, the reduction in the PD was non-significant at 0 and 3 months (P<0.001). The microbial analysis showed significant reduction in Porphyromonas gingivalis and Prevotella intermedia though there was no significant reduction in the Actinobacillus actinomycetemcomitans.

Conclusion

Authors found that clinical parameters in periodontitis patients were improved with tetracycline in adjunct to SRP improves as compared to SRP alone.

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