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## Original Research

### Efficacy of chlorhexidine and tetracycline in management of cases of chronic periodontitis- A clinical study

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#### ABSTRACT:

**Background:** Chronic periodontitis is a multifactorial disease and results in a progressive loss of attachment and formation of periodontal pocket. The present study was conducted to compare chlorhexidine and tetracycline local drug delivery systems in management of persistent periodontal pockets. **Materials & Methods:** The present study was conducted on 60 patients who were divided into 3 groups of 20 each. Group I patients received scaling and root planning only, group II received scaling and root planning and chlorhexidine chip and group III patients received scaling and root planning and tetracycline fibers. Clinical parameters such as the plaque index (PI); the gingival index (GI); probing depth (PD) and clinical attachment level (CAL) using the UNC-15 probe were recorded at baseline, 1 month, 3 months, 6 months and after 1 years. **Results:** The mean PI at baseline in group I was 1.26, at 1 month was 0.76, at 3 months was 0.64, at 6 months was 0.54 and at 1 year was 0.52. The mean GI at baseline was 1.80, at 1 month was 0.94, at 3 months was 0.86, at 6 months was 0.64 and at 1 year was 0.62. A significant difference was found ( $P < 0.05$ ). The mean PI at baseline in group II was 1.24, at 1 month was 0.74, at 3 months was 0.68, at 6 months was 0.52 and at 1 year was 0.52. The mean GI at baseline was 1.72, at 1 month was 0.80, at 3 months was 0.74, at 6 months was 0.62 and at 1 year was 0.60. A significant difference was found ( $P < 0.05$ ). The mean PI at baseline in group III was 1.44, at 1 month was 0.78, at 3 months was 0.76, at 6 months was 0.60 and at 1 year was 0.56. The mean GI at baseline was 1.82, at 1 month was 0.92, at 3 months was 0.74, at 6 months was 0.56 and at 1 year was 0.54. A significant difference was found ( $P < 0.05$ ). **Conclusion:** Authors found that both tetracycline and chlorhexidine found to be effective in the management of cases of chronic periodontitis.

**Key words:** Chronic periodontitis, Chlorhexidine, Tetracycline

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#### INTRODUCTION

Chronic periodontitis is a multifactorial disease and results in a progressive loss of attachment and formation of periodontal pocket.<sup>1</sup> The process of

periodontal pocket formation represents the pathologic sequela of microbial and inflammatory mediated degradation of collagenous connective tissue and alveolar bone. Mechanical therapy can be clinically

successful in many patients, however persistence or regrowth of certain micro-organisms in treated sites should be considered as a cause of unsatisfactory treatment outcome.<sup>2</sup> It is thus important in managing such sites that adjunctive therapies should be considered. Topical administration of antibacterial agents in the form of mouth washes, dentifrice or gels can be used effectively in controlling supragingival plaque.<sup>3</sup> The shortcomings of rinsing, irrigating and similar forms of drug placement include rapid clearance which results in inadequate exposure to drug leading to lack of clinical results. Subgingival antimicrobial delivery system is a commonly used method which use different delivery systems that influence the concentration and maintenance of the concentration of available drugs over time.<sup>4</sup>

Numerous agents such as tetracycline, doxycycline, minocycline, chlorhexidine, metronidazole, enzymes and quaternary ammonium compounds are used to inhibit further progression of periodontal disease either as monotherapy or as an adjunct to scaling and root planning (SRP) procedure. Topical antiseptics are widely used for treating plaque-related gingivitis. Chlorhexidine (CHX) is most effective antimicrobials reported till now and is not known for any appreciable resistance to oral microorganisms.<sup>6</sup> The present study

was conducted to compare chlorhexidine and tetracycline local drug delivery systems in management of persistent periodontal pockets.

**MATERIALS & METHODS**

The present study was conducted in the department of Periodontics. It comprised of 60 patients of both genders. Inclusion criteria were good systemic health, at least 2 non-adjacent teeth with persistent periodontal pocket of probing depth  $\geq 5$  mm with bleeding on probing or suppuration. The approval for the study was obtained from ethical committee before starting study. All patients were informed regarding the study and their consent was obtained.

Demographic data of patients was recorded. All patients were divided into 3 groups of 20 each. Group I patients received scaling and root planning only, group II received scaling and root planning and chlorhexidine chip and group III patients received scaling and root planning and tetracycline fibers. Clinical parameters such as the plaque index (PI); the gingival index (GI); probing depth (PD) and clinical attachment level (CAL) using the UNC-15 probe were recorded at baseline, 1 month, 3 months, 6 months and after 1 years. Results 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	Group III
Method	SRP only	SRP+ chlorhexidine	SRP+ tetracycline
Number	20	20	20

Table I shows that group I patients received scaling and root planning only, group II received scaling and root planning and chlorhexidine chip and group III patients received scaling and root planning and tetracycline fibers.

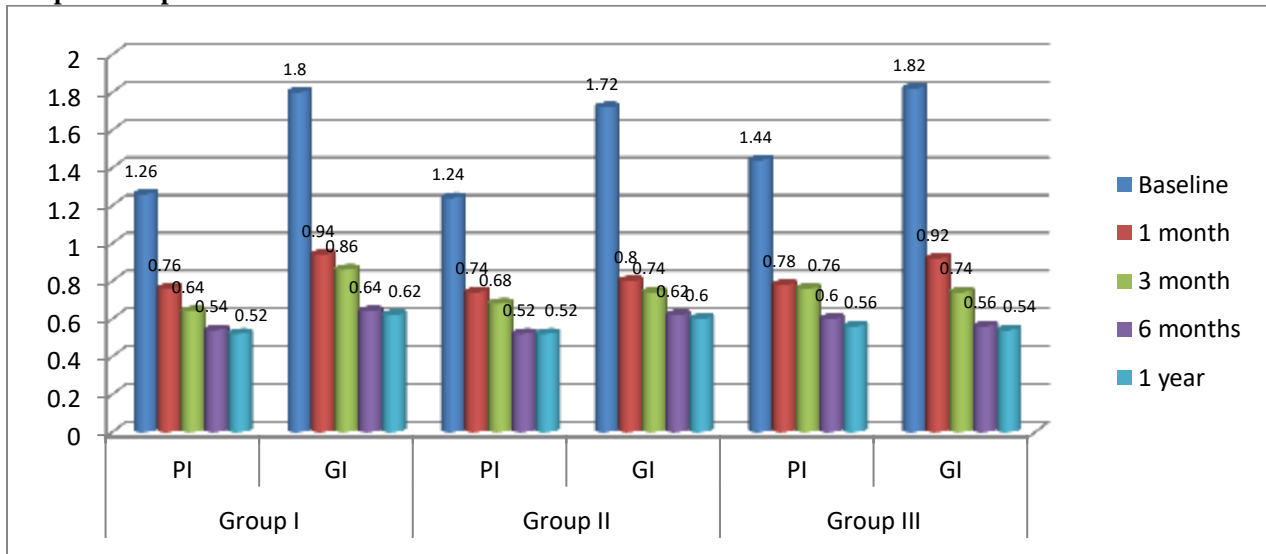
**Table II Comparison of PI and GI**

Groups	Parameter	Baseline	1 month	3 month	6 months	1 year	P value
Group I	PI	1.26	0.76	0.64	0.54	0.52	0.02
	GI	1.80	0.94	0.86	0.64	0.62	0.01
Group II	PI	1.24	0.74	0.68	0.52	0.52	0.03
	GI	1.72	0.80	0.74	0.62	0.60	0.01
Group III	PI	1.44	0.78	0.76	0.60	0.56	0.02
	GI	1.82	0.92	0.74	0.56	0.54	0.05

Table II, graph I shows that mean PI at baseline in group I was 1.26, at 1 month was 0.76, at 3 months was 0.64, at 6 months was 0.54 and at 1 year was 0.52. The mean GI at baseline was 1.80, at 1 month was 0.94, at 3 months was 0.86, at 6 months was 0.64 and at 1 year was 0.62. A significant difference was found ( $P < 0.05$ ). The mean PI at baseline in group II was 1.24, at 1 month was 0.74, at 3 months was 0.68, at 6 months was 0.52 and at 1 year was 0.52. The mean GI at baseline was 1.72, at 1 month was 0.80, at 3 months was 0.74, at 6 months was 0.62 and at 1 year was 0.60. A significant difference was found ( $P < 0.05$ ).

The mean PI at baseline in group III was 1.44, at 1 month was 0.78, at 3 months was 0.76, at 6 months was 0.60 and at 1 year was 0.56. The mean GI at baseline was 1.82, at 1 month was 0.92, at 3 months was 0.74, at 6 months was 0.56 and at 1 year was 0.54. A significant difference was found ( $P < 0.05$ ).

**Graph I Comparison of PI and GI**



**Table III Comparison of CAL changes in all groups**

Groups	Parameter	Duration	Mean reduction	P value
Group I	Baseline	1 month	1.54	0.04
		3 months	2.02	0.02
		6 months	1.82	0.01
		1 year	2.2	0.03
Group II	Baseline	1 month	0.68	0.05
		3 months	1.02	0.01
		6 months	1.04	0.03
		1 year	1.2	0.02
Group III	Baseline	1 month	0.65	0.04
		3 months	0.74	0.05
		6 months	0.54	0.01
		1 year	0.86	0.02

Table III shows that there was significant reduction of clinical attachment level changes from baseline to 1 month, 3 months, 6 months and 1 year in group I, II and III ( $P < 0.05$ ).

**Table IV Comparison of probing depth changes in all groups**

Groups	Parameter	Duration	Mean reduction	P value
Group I	Baseline	1 month	2.7	0.02
		3 months	3.4	0.03
		6 months	3.6	0.04
		1 year	3.4	0.05
Group II	Baseline	1 month	1.7	0.02
		3 months	2.8	0.04
		6 months	3.2	0.02
		1 year	3.0	0.01
Group III	Baseline	1 month	2.6	0.02
		3 months	3.4	0.03
		6 months	3.2	0.02
		1 year	2.8	0.01

Table IV shows that there was significant probing depth changes from baseline to 1 month, 3 months, 6 months and 1 year in group I, II and III ( $P < 0.05$ ).

## DISCUSSION

It is evident that subgingival irrigation using CHX solution or CHX gels is poorly efficacious in the management of periodontitis, due to poor retention of the drug for sufficient time. However, it is difficult to maintain the effective antibacterial concentrations, for a sufficient period in periodontal pockets for a variety of reasons like poor penetration by mouth rinses, rapid dissipation of irrigation solutions, relatively low localized concentrations achievable with high systemic dose of antibiotics.<sup>7</sup> Goodson<sup>8</sup> suggested that successful control of periodontal microflora demands a delivery of an intrinsically effective antimicrobial agent. These agents reach the periodontal pocket and maintain minimum effective concentration for a sufficient duration to produce the desired specific therapeutic effect. Tetracyclines have been incorporated into a variety of delivery systems for insertion into periodontal pockets.<sup>9</sup> Perio Col TM-CG and tetracycline hydrochloride have been introduced in the market.<sup>10</sup> The present study was conducted to compare chlorhexidine and tetracycline local drug delivery systems in management of persistent periodontal pockets.

In this study, group I patients received scaling and root planning only, group II received scaling and root planning and chlorhexidine chip and group III patients received scaling and root planning and tetracycline fibers. Reddy et al<sup>11</sup> included 48 patients which were divided into 3 treatment groups. One group received scaling and root planning only, whereas the other 2 groups received scaling and root planning plus one of 2 antimicrobial systems adjunctively. Clinical parameters were recorded at baseline, 1 month, 3 months, 6 months and 1 year after treatment. All the patients showed significantly improve plaque and gingival index scores at the end of 1 year. Probing depth and Clinical Attachment Level (CAL) significantly improved in all the groups. However administration of chlorhexidine provided the best results.

We found that mean PI at baseline in group I was 1.26, at 1 month was 0.76, at 3 months was 0.64, at 6 months was 0.54 and at 1 year was 0.52. The mean GI at baseline was 1.80, at 1 month was 0.94, at 3 months was 0.86, at 6 months was 0.64 and at 1 year was 0.62. A significant difference was found ( $P < 0.05$ ). The mean PI at baseline in group II was 1.44, at 1 month was 0.78, at 3 months was 0.76, at 6 months was 0.60 and at 1 year was 0.56. The mean GI at baseline was 1.82, at 1 month was 0.92, at 3 months was 0.74, at 6 months was 0.56 and at 1 year was 0.54. A significant difference was found ( $P < 0.05$ ).

Srivastava et al<sup>12</sup> compared Perio Col TMCG (Chlorhexidine - CHX- chip) with Periodontal Plus ABTM (Tetracycline fibers) in 3 experimental

treatment groups, Group A- SRP + CHX Chip, Group B- SRP + Tetracycline fibers, and Group C- SRP alone (control group). 45 sites in 14 patients with chronic periodontitis were assessed. All the treatment groups were found to be efficacious in the treatment of periodontal disease as demonstrated by improvement in PD and RAL.

We found that there was significant reduction of clinical attachment level changes from baseline to 1 month, 3 months, 6 months and 1 year in group I, II and III ( $P < 0.05$ ). There was significant probing depth changes from baseline to 1 month, 3 months, 6 months and 1 year in group I, II and III ( $P < 0.05$ ).

## CONCLUSION

Authors found that both tetracycline and chlorhexidine found to be effective in the management of cases of chronic periodontitis.

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