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Research Article

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Chlorhexidine varnish: An attempt to vanish moderate periodontitis

Shweta Hugar[1], Suvarna Patil[2], Renuka Metgud[1], Rajeshwari[1] and Shivayogi M. Hugar[3]

[1]Dept of Periodontics, K.L.E. V.K. Institute of Dental Sciences, K.L.E. University, Belagavi
[2]Dept of Periodontics, Nataji Rao Halgekar Maratha Mandal's Dental College, Belagavi
[3]Dept of Pedodontics& Preventive Dentistry, K.L.E. V.K Institute of Dental Sciences, K.L.E. University, Belagavi

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ABSTRACT

Periodontitis is "an inflammatory disease of the supporting tissues of the teeth caused by specific microorganisms or groups of specific microorganisms, resulting in progressive destruction of the periodontal ligament and alveolar bone with pocket formation, recession, or both." Untreated periodontitis results in progressive attachment loss that may eventually lead to early tooth loss. The aim of our study was to evaluate and compare the efficacy of subgingival application of chlorhexidine varnish and chlorhexidine gel as an adjunct to scaling and root planning in the treatment of mild to moderate(4-6mm) periodontal pockets. Thirty subjects having mild-moderate chronic periodontitis (pockets 4-6 mm) were selected for the study and were divided into 2 groups using a split mouth design. In Group I pockets were treated by SRP followed by chlorhexidine gel application. In Group II pockets were treated by SRP followed by chlorhexidine varnish application. The plaque index, gingival index, probing pocket depth were recorded at baseline and subsequently at 1 week and 4 weeks. The results revealed that both Chlorhexidine gel and chlorhexidine varnish demonstrated statistically significant improvement in all clinical parameters in mild to moderate chronic periodontitis. Although both the groups showed effective results, on intergroup comparison group II showed better results than group I. It can be concluded that chlorhexidine varnish can be considered as the effective method in the treatment of mild to moderate periodontitis.

Keywords: Chronic periodontitis, Local drug delivery, Chlorhexidine gel, Chlorhexidine varnish.

INTRODUCTION

Periodontitis is"an inflammatory disease of the supporting tissues of the teeth caused by specific microorganisms or groups of specific microorganisms, resulting in progressive destruction of the periodontal ligament and alveolar bone with pocket formation, recession, or both." Untreated periodontitis results in progressive attachment loss that may eventually lead to early tooth loss [1]. Untreated periodontitis results in progressive attachment loss that may eventually lead to early tooth loss. Several therapeutic modalities have been considered to arrest the disease progression and to regenerate the lost tissue. The adequacy of mechanical debridement(Scaling and root planning-SRP) in the treatment of periodontitis is commonly acknowledged (Hill et al 1981, Ramfjord et al 1987, Kaldahl et al 1988). However, scaling and root planing was found to be of limited efficacy, especially of deep pockets or furcations because accretions can be easily left behind (Waerhaug 1987, Robertson 1987) [2].

Initially systemic antimicrobial therapy was used but there were disadvantages like development of bacterial resistance, exposure of whole body to the drug. So the local administration of antimicrobials has received considerable attention during the past decade [3].

Chlorhexidine is a bis-biaguanide agent with antibacterial properties, having a special affinity for oral structures. The effect of chlorhexidine in inhibiting plaque formation and reducing bacteria in the oral cavity, including streptococci, which are associated with development of caries is well established in the literature. Chlorhexidine is widely used in clinical dentistry in various vehicles such as gels, sprays, varnishes, mouthwashes, chips.[4]

Thus, the aim of this study was to evaluate and compare the efficacy of chlorhexidine varnish and gel in the treatment of mild to moderate periodontal pockets as an adjunct to scaling and root planing.

METHOD OF COLLECTION OF SAMPLE: The required sample for the study was obtainedfrom the Outpatient Department of Periodontics, K.L.E. Vishwanath Katti Institute of Dental Sciences, K.L.E. University Belgaum. A total of 30 subjects comprising of both the sexes and diagnosed with chronic localized or generalized periodontitis (according to AAP classification 1999), above 20 years of age were considered for the present study.

INCLUSION CRITERIA

- Chronic periodontitis patients
- Agegroup between 25 and 50 years.
- Probing pocket depth (PPD) 4-6mm.
- Gingival index(GI) (Loe & Silness 1963) score : 2 -3
- Plaque index (PI)(Silness & Loe 1964) score : 2- 3

EXCLUSION CRITERIA

- Subjects having taken antibiotics/any other medications prior to or during the trial.
- Any systemic disorders that would contraindicate the periodontal therapy.
- Pregnant or Lactating women
- Smokers
- Patient allergic to chlorhexidine gluconate

METHODOLOGY

- A special preforma was designed for the present study.
- Split mouth technique.
- Group I (Right Side) ⇨ SRP + Chlorhexidine gel(0.2%)
- Group II (Left Side) ⇨ SRP + Chlorhexidine varnish (1% CHX & 1%Thymol)
- Periodontal pack application.
- Recall at 1 and 4 weeks.

STEPWISE PROCEDURE USED IN THE STUDY:

The study was carried out on 30 subjects who fulfilled the inclusion and exclusion criteria of the study. Ethical approval was obtained from the institutional review board before the commencement of the study. All potential participants were explained the need and design of the study. Only those subjects who consented by written informed consent for the study were included. Data was collected from the subjects as they could fulfill all the criteria defined in the study.

The clinical parameters of the patients were evaluated at baseline (Zero day) and 4 weeks.

1. Plaque index(Silness and Loe 1964)
2. Gingival Index (Loe and Silness 1963)
3. Pocket depth measurement using William s graduated probe.

PROCEDURE OF PERIODONTAL THERAPY:

After fulfilling inclusion and exclusion criteria patients with localized or generalized chronic periodontitis cases were selected for the present study (Fig-1). Scaling was performed by piezoelectric ultrasonic scalers and root planing was performed by area specific Gracey curettes under the strict aseptic condition. After thorough scaling and root planning,probing pocket depth was re-determined followed by the local drug delivery fig 3.

Group I:Right side was completely dried using air syringe and then the site was isolated with cotton rolls to prevent contamination from saliva. The local drug delivery system consisting of 0.2% Chlorhexidine(CHX) Gel was placed in the periodontal pockets by applicator tips or syringe with a needle attached to it. Fig-4a

Similarly in Group II: on left side the local drug delivery system consisting of chlorhexidine varnish (1% CHX & 1%Thymol) was placed in the periodontal pockets through a syringe with a needle attached to it. The pocket opening was covered by coe-pak to retain the material in the pocket, as well as to prevent the ingress of oral fluids.Fig-4bThe clinical parameters such as Plaque index(Silness and Loe 1964) Gingival Index (Loe and Silness 1963) Pocket depth measurement using Williams graduated probe were evaluated at 4 (Fig-5b) 4weeks.

CHRONIC PERIODONTITIS PATIENTS

Fig-1 Pre-Operative image

Fig-2 post scaling and root planning image

Fig- 3Photograph showing Immediate Post- Operative

Fig-4a Group I: CHX Gel

fig-4b Group II: CHX Varnish

Photograph showing application of chlorhexidine gel and chlorhexidine varnish

Fig 5a: Group I: CHX Gel

Fig-5b: Group II: CHX Varnish

Photograph showing probing pocket depth determination at 4 weeks

STATISTICAL ANALYSIS

Mean of standard deviation of parameters like pocket depth, gingival index, plaque index was computed and then compared between the study groups by using un-paired't' test. Level of significance was kept $P < 0.05$

RESULTS

Gingival indices: The mean score of gingival index for group 1 and group 2 are 2.51±0.36 (Baseline), 2.02±0.41 (four weeks). 2.45±0.45 (Baseline), and 1.59±0.36(four weeks) respectively. Although both the groups showed improvement in gingival indices from baselineto four weeks, the results obtained by group 2 (Chlorhexidine varnish) were better than group 1. The difference between the groups were statistically significant. (Table1, graph 1)

Plaque indices: The mean score of plaque index for group 1 and group 2 are 2.63±0.36 (Baseline), 1.94±0.55 (four weeks). 2.61±0.47 (Baseline), and 1.58±0.35 (four weeks) respectively. Although both the groups showed

improvement in gingival indices from baseline to four weeks, the results obtained by group 2 (Chlorhexidine varnish) were better than group 1. The difference between the groups were statistically significant. (Table2, graph 2)
Probing pocket depth: pocket depth was measure in both groups at baseline and four weeks. Pocket depth reduction was higher in group 2 than group 1. The differences between the groups were statistically significant. (Table3, Graph 3)

TABLE NO.1: COMPARISON OF GINGIVAL INDEX IN GROUP I & GROUP II

GROUP S	DAY 0	DAY 30	DIFFERENCE
I	2.51±0.36	2.02±0.41	0.49±0.33
II	2.45±0.45	1.59±0.36	0.86±0.42
t value	0.504	4.265	3.787
P value	0.616	< 0.001*	< 0.001*

GRAPH NO.1: COMPARISON OF GINGIVAL INDEX IN GROUP I & GROUP II

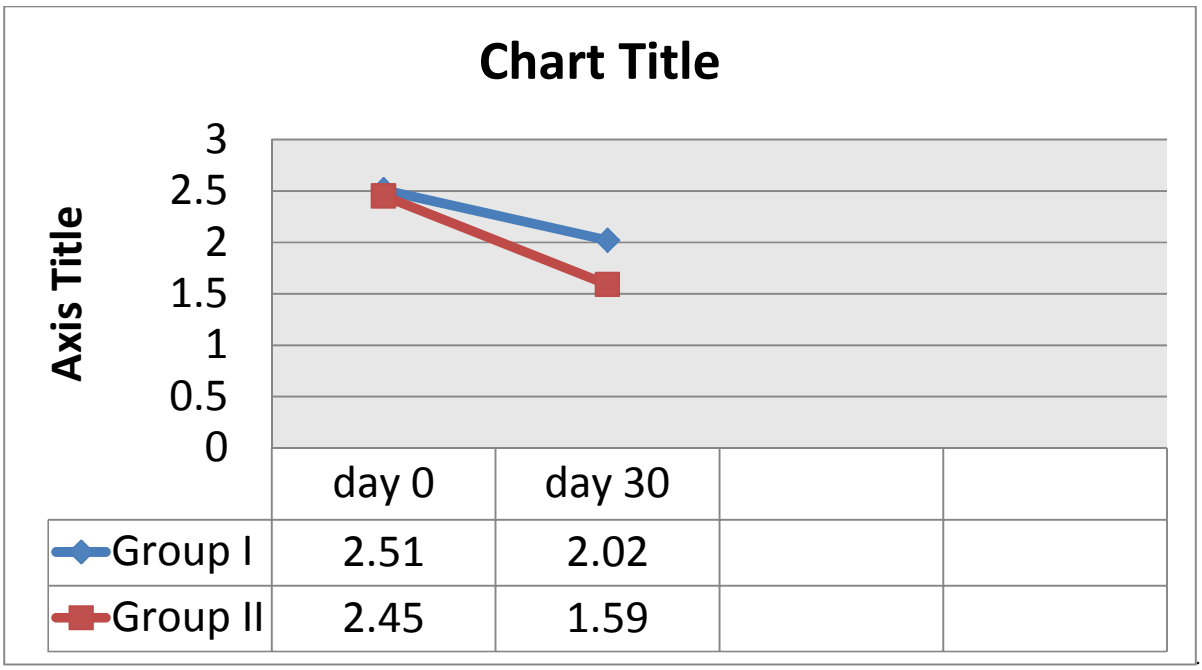


TABLE NO.2: COMPARISON OF PLAQUE INDEX IN GROUP I & GROUP II

I	2.63±0.36	1.94±0.55	0.69±0.39
II	2.61±0.47	1.58±0.35	1.02±0.46
t value	0.215	2.712	3.021
P value	0.831	< 0.009*	< 0.004*

** Denotes statistical significant*

GRAPH NO.2: COMPARISON OF PLAQUE INDEX IN GROUP I & GROUP II

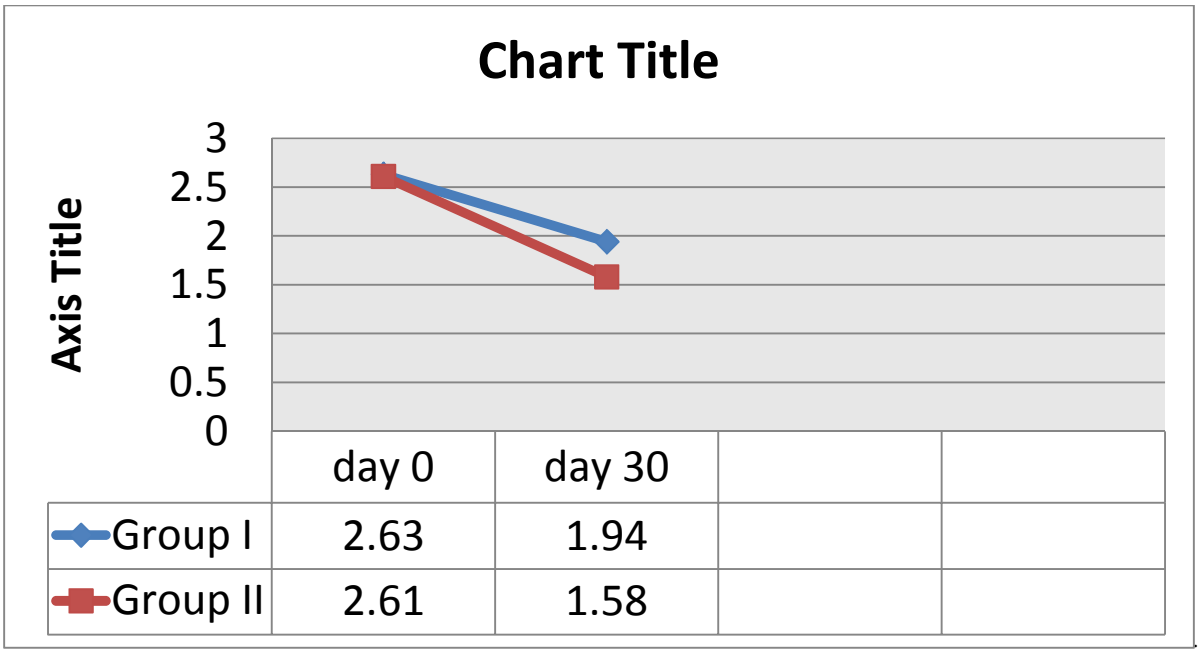
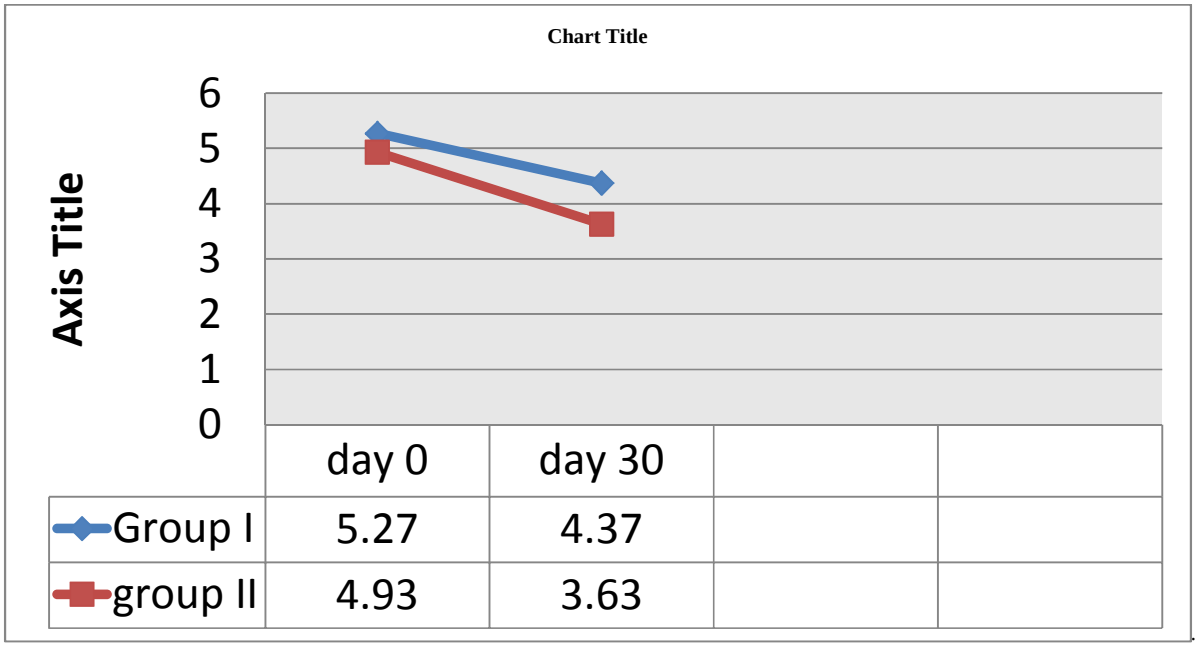


TABLE NO.3: COMPARISON OF PROBING POCKET DEPTH IN GROUP I & GROUP II

I	5.27±0.74	4.37±0.76	0.9±0.40
II	4.93±0.74	3.63±0.66	1.3±0.53
t value	1.745	3.954	3.272
P value	0.86	< 0.001*	< 0.002*

** Denotes statistical significant*

GRAPH NO.3: COMPARISON OF PROBING POCKET DEPTH IN GROUP I & GROUP II



DISCUSSION

Even though the outcome of mechanical debridement usually satisfies in terms of reduction in probing depth and bleeding on probing, difficulties reaching the bottom of the pocket can lead to its failure. Furthermore, some microbiota simply cannot be mechanically eradicated, indeed bacterial invasion in cementum, radicular dentin and the surrounding periodontal tissues has been reported [5].

Various antibiotics and antimicrobial agents have been suggested as adjunct to enhance mechanical plaque control. Chlorhexidine has been described as an ideal antimicrobial agent which is clinically effective in reducing plaque and gingivitis, affects pathogenic flora. (Vander ouderaa 1991)[3].

Chlorhexidine is a bisbiguanide antiseptic, being a symmetrical molecule consisting of four chlorophenyl rings and two biguanide groups connected by a central hexamethylene bridge. The antiseptic binds strongly to the bacterial cell membranes. At low concentration this results in increased permeability with leakage of intracellular components including potassium (Hugo and Longworth 1964,1965). At high concentration, chlorhexidine causes precipitation of bacterial cytoplasm and cell death [6].The consideration that professionally applied chlorhexidine varnish and gel overcomes the non-compliance of the patient as opposed to mouth rinses make them an appealing vehicle for chlorhexidine delivery [3].

The present study was carried out with the objective to evaluate and compare the efficacy of chlorhexidine varnish (cervitec) and chlorhexidine gel (cervitec) as an adjunct to scaling and root planing in the treatment of mild to moderate periodontal pockets for a period of 4 weeks.In the present study at baseline between the two groups there was no statistically significant difference in mean plaque index score, gingival index score, probing pocket depth and both the groups showed statistically significant reduction in mean plaque index, gingival index and probing pocket depth at 4 weeks when compared to baseline (day 0). These findings are in accordance with Oosterwaal PJM (1991) Unsal E et al (1994)Cosyn J (2007) R Amita (2011)[3].

The results of the present study also showed that treatment strategy supplementing scaling and root planing with subgingival chlorhexidine varnish application provides significantly greater reduction in plaque score, gingival score, probing pocket depth when compared scaling and root planing with chlorhexidine gel application. These findings are in accordance with the results obtained in studies done by *Cosyn J (2005),* [2]*Rodrigues Ivana Ferreira Gomes (2007)*[10].

CONCLUSION

Subgingival application of chlorhexidine varnish after scaling and root planing is beneficial in treating mild to moderate periodontal pockets when compared to chlorhexidine gel application after SRP.

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