

Appraisal of Effectiveness of one stage Full Mouth Disinfection using Chlorhexidine and Ayurvedic Mouth Rinse and Gel in Patients with Chronic Periodontitis: A Clinical Study

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Abstract

Background: Present days justified the significant clinical improvements when severe chronic periodontitis was treated with one-stage full-mouth disinfection instead of standard conventional treatment strategy using continuous SRP quadrant per quadrant. Recently Ayurvedic drugs are effective for the treatment of Periodontitis with the notable upgrade in clinical parameters. This study aims to compare the effect of Chlorhexidine & Ayurvedic drugs for full mouth disinfection.

Aim and Objective: To compare and evaluate the clinical benefits of Chlorhexidine (mouth rinse + gel) and Ayurvedic drugs (Himalaya mouth rinse + gel) in one-stage full-mouth disinfection, in chronic periodontitis patients.

Materials and Methods: A total of 30 systemically healthy patients with chronic periodontitis having pocket depth ≥ 5 mm participated in this study. They were randomly divided into 3 groups using a computer-generated random number table. Group A: full-mouth SRP quadrant per quadrant, at 2 weeks interval. Group B: Full mouth disinfection using Chlorhexidine and Group C: Full mouth disinfection using Ayurvedic drugs (Himalaya mouth rinse & gel). The clinical parameters evaluated at baseline, 3 weeks & 6 weeks are Probing pocket depth (PPD), Plaque index (PI), Clinical attachment level (CAL), and Modified sulcus bleeding index (MSBI).

Result: Both Group B and Group C showed statistically significant improvements in all clinical parameters at 3 weeks and 6 weeks compared to baseline.

Conclusion: This study concludes that one-stage full-mouth disinfection using both chlorhexidine and ayurvedic drugs is advantageous for the treatment of patients suffering from chronic periodontitis.

Keywords: Periodontitis, plaque, chlorhexidine, ayurvedic, mouth wash, and full mouth disinfection.

Introduction

Periodontal health cognizance and enhancement in modern preventive dentistry have led to a decrease in tooth loss in all age categories. Following periodontal treatment with the substantial increase in periodontal therapy has increased life expectancy and greater health of patients. Chronic periodontal disease with deep periodontal pockets affects 10%–15% of the adult population globally.¹

Profuse investigational studies on gingivitis proved the first speculative evidence that accumulation of microbial film on tooth surfaces results in the development of an inflammatory process around the gingival tissue.² Backing with this process, local inflammation persists throughout the microbial film is present adjoining the gingival tissues, and settled down after removal of the biofilm. Consequently, treatment is administered for disruption of biofilm using various chemical and mechanical modalities as using toothbrushes, antimicrobial mouthwashes such as chlorhexidine, mixtures containing essential oil, and cetylpyridinium.

Potent plaque control from Chlorhexidine is the “gold standard” mouthwash because of its antibacterial action, efficacy, and substantivity. It is a cationic bisguanide with a broad-spectrum antiseptic with pronounced antimicrobial effect on Gram-positive and negative bacteria, yeast, dermatophytes, and some lipophilic viruses, and also the dominant antiplaque agent.³ Nevertheless, constant use of chlorhexidine can cause stains on teeth, tongue, and gingival, also on silicate and resin restorations, alter taste sensation, xerostomia, and ulcers. Thus, avoided for daily prophylactic use.⁴

As stated by WHO, more than 80% of the world's population relies on traditional herbal medicine “Ayurveda” for their primary health care because of its ease of availability, more curative, long-term effects, and cheaper than other modern medicines with limited or no side effects as these are indigenous preparations from natural resources.⁵ Ayurvedic drugs have been used since ancient times to treat oral diseases including periodontal diseases. *Sushruta Samhita* in his 20th shloka has stated that *Triphala* can be used as a gargling agent in dental diseases as it has antibacterial, antiseptic, and anti-inflammatory properties. For oral diseases, Charaka Samhita and Sushruta Samhita with their properties, action, and therapeutic effect are well defined and are entailed as an alternative to chlorhexidine.⁶ In this study comparative analysis is done between chlorhexidine mouthwash and gel and Ayurveda containing Himalaya mouth wash and gel.

Materials and Methods

For this study thirty systemically healthy patients from the outpatient Department of Periodontology of VYWS Dental College And Hospital, Amravati was selected. Age group between 25–55 years of either gender diagnosed with chronic periodontitis having three or more non-adjacent teeth with pockets ≥ 5 mm nonsmokers and nontobacco users were selected. Uncooperative and unacceptable oral hygiene patients, undergone subgingival instrumentation within 12 months before the baseline examination, having compromised medical conditions which required prophylactic antibiotic coverage, or had used antimicrobial agents 4 months before were excluded from the study. The clinical parameters of the study are as follows: Probing pocket depth (PPD), Plaque index (PI), Clinical attachment level (CAL), and Modified sulcus bleeding index (MSBI)

All of the thirty patients were allocated into three groups as Group A- (control group subjected to SRP alone), Group B (chlorhexidine mouth wash and gel), and Group C (Himalaya mouth wash and gel) evaluation of parameters was done in 3 weeks and 6 weeks from baseline examination. For group B immediately after instrumentation of SRP during the first visit patients, the oral cavity was disinfected using 0.2% chlorhexidine mouth washes and subgingival irrigation using 1% chlorhexidine gel application for one minute, same was done with group C and were instructed to use mouthwash after 24 hours twice daily for one minute routinely for 6 weeks with same concentration following modified bass brushing technique.

Statistical Analysis

For the plaque index, modified sulcus bleeding index, probing pocket depth, and clinical attachment level a mean score per patient at baseline first visit, after 3 weeks, and after 6 weeks was calculated. A comparison for these parameters within groups (baseline versus follow-up visit) was made by means of a pairwise comparison using the Post Hoc test. For a comparison between groups (at each follow-up visit) an Anova analysis has been applied.

Results

All of the thirty patients (10 in each group) completed 6 weeks of treatment. Intra-group comparison of groups A,B, and C following baseline 3 weeks and 6 weeks showed a statistically significant difference in PI, MSBI, PPD, and CAL with a p-value of 0.001. Further, the pair-wise comparison between baseline versus after 3 weeks and baseline versus 6 weeks showed significant results with a p-value of 0.001. Inter-group comparison for PPD, CAL, and MSBI between groups A, B, and C after 6 weeks showed significant results with $p \leq 0.05$. PI showed significant values after 3 weeks and 6 weeks. Pair-wise comparison test for PPD between group A and B, group A and C after 6 weeks showed the significant result. For PI the significant result was seen between group A and B after 3 and 6 weeks, also with group A and C after 3 and 6 weeks. CAL showed significant value between groups A and B, group A and C after 6 weeks only. No significant result with MSBI.

Discussion

The present study shows that ayurvedic mouthwash was equally effective as conventional chlorhexidine mouthwash in reduction of Probing pocket depth, Plaque index, Clinical attachment level, and Modified sulcus bleeding index throughout 6 weeks usage. Chemicals are being used extensively with researches for 3–4 decades and are continuing. Ample of agents with antimicrobial and inhibiting bacterial proliferation phase of plaque are available.⁷ Amongst all these agents Chlorhexidine (CHX), a cationic bisbiguanide is a bonanza due to its significant and broad-spectrum antibacterial property.⁸ Numerous studies have reported the efficacy of Chlorhexidine in reducing plaque accumulation and gingival inflammation.⁹ However, chlorhexidine usage has its limitations such as brown discoloration of dentition and restorative material, dorsum of the tongue, taste perturbation, oral mucosal ulceration, unilateral/bilateral parotid swelling, and enhanced supragingival calculus formation on its longterm use.¹⁰

Ayurveda agents are native compositions from natural resources since ancient times, have extensively being used and proved for improving the body's immunity to form antibodies to inhibit any invasion of antigens. Ayurvedic drugs have been used in various oral diseases including periodontal diseases. *Sushruta Samhita* in his 20th shloka has stated that *Triphala* can be used as a gargling agent in dental diseases as it has antibacterial, antiseptic, and anti-inflammatory properties.⁶ Ayurveda drugs are also available in various combinations, the most commonly used is Triphala a combination of three medicinal plants, *Amalaki Phyllanthus Emblica* (syn. *Emblica Officinalis*) *Phyllanthaceae* family, *Haritaki (Terminalia chebula)* *Combretaceae* family, and *Bahera (Terminalia bellirica)* *Combretaceae* family. Triphala has been reported to have antimicrobial, antiseptic, anti-inflammatory, and antioxidant properties, among others, and is been widely used.^{6,11}

Various studies have been conducted exhibiting favorable results of Ayurvedic products for the treatment of dental diseases. Many natural plants are used for the preparation of mouthwashes

such as aloe vera, pot marigold; Triphala, green tea, turmeric, neem, cranberry, etc. and proved to be effective in reducing plaque accumulation and gingival inflammation.¹²

So, the present study assessed and compared the efficacy of Ayurvedic mouthwash with that of conventional Chlorhexidine mouthwash. Performing oral prophylaxis after recording baseline data was done to assess the effect of scaling and root planning alone in the control group and to assess the effect of the mouthwashes on periodontal health in the other two groups at 3 weeks and 6 weeks. The present study showed improved periodontal health status in all the groups over 3 weeks. After 3 weeks till 6 weeks, the reduction in PPD which was 4.50 ± 0.97 and 4.70 ± 1.06 for Group B and Group C, for PI same value was seen of 1.28 ± 0.11 for Group B and Group C, CAL showed 2.50 ± 0.97 and 2.60 ± 0.84 for Group B and Group C and MSBI showed 0.59 ± 0.10 and 0.63 ± 0.08 for Group B and Group C, as compared to Group A much difference in reduction of PPD, PI, CAL, and MSBI scores was observed. After 6 weeks in Group B and Group C for PPD the score was 3.60 ± 0.70 and 3.70 ± 0.68 , for PI 1.08 ± 0.06 and 1.08 ± 0.06 , for CAL 1.60 ± 0.84 and 1.60 ± 0.70 , for MSBI 0.51 ± 0.10 and 0.49 ± 0.06 all these scores are less than group A and group B. The probable reason for much difference in periodontal conditions after 3 weeks and 6 weeks in Group C could be that the mouthwashes revealed to have the maximum benefit after 6 weeks that it was more effective confirming the benefits of mouthwashes on long term use in maintaining proper gingival health as compared to group A and group B.

On the other hand, the periodontal health in Group A at baseline, after 3 weeks and 6 weeks was improved thus proving the adjuvant effect of mouthwashes in the other two groups. This shows the useful effect of scaling and root planning on periodontal health for the transient period. The results of the present study were similar to the study conducted by Aspalli et al., and Parwani et al., where herbal mouthwash was equally effective as Chlorhexidine mouthwash. Also, the study conducted by Rao et al., have shown Arimedi oil to be effective in improving periodontal status in more than 80% of subjects while in the present study there was improvement in periodontal status in all 100% (15) subjects in Group C.¹³

Including gram-positive and gram-negative organisms like bacteria, fungi, yeasts, and viruses are inhibited by Chlorhexidine gluconate mouthwash as it exhibits both anti-plaque and antibacterial properties. Its superior anti-plaque activity is attributed to its substantivity and pin-cushion effect.¹⁰

On the other hand, Ayurvedic mouth wash has been proven for its astringent and bactericidal properties, analgesic and anticaries agent, anti-inflammatory blood purifier, analgesic, anti-plaque, and anti-gingivitis agent.¹⁴ The improvement in gingival health in Group C might have been due to these ingredients present in the Ayurvedic mouthwash. However, the exact mechanism of action of the Ayurvedic ingredients on periodontal health needs to be studied explored.

The present study was carried out over a period of two intervals i.e after 3 and 6 weeks from the baseline period, to assess the long-term effect of mouthwashes used. According to Naitkari et al., Chlorhexidine should never be used for more than two weeks to avoid its local side effects such as teeth staining and taste alteration. No adverse effect was seen during this study as oral prophylaxis performed at baseline and routine oral hygiene practices reduced the chances of staining of teeth during the study period.¹⁵

The Ayurvedic mouthwash used in this study was fairly effective like chlorhexidine mouthwash in upgrading periodontal health; however, the conformity with Ayurvedic is still controversial due to its lack of specific ingredients and mechanism of action. So, attempts should be made to make it more acceptable and flavourful by studying the details of Ayurvedic contents with functions of each and every ingredient and its effectiveness on oral health care. Further studies need to be conducted among the general public to explore the efficacy and safety of mouthwash in other forms of periodontal diseases.

Limitation

Ayurvedic mouthwash manifested and worthwhile in reduction of plaque and periodontitis over the period of this study, however, to observe its long-run beneficial effects more longitudinal studies need to be supervised. No side effects were observed during the study still further clinical experimentations are required to check for its goodly, minimum inhibitory concentration, and its effects on overall systemic health. With the positive results speculating in future studies, Ayurvedic products can have more clinical effective interference, and thus can become as an alternative to Chlorhexidine with no or negligible side-effects and could be favored and recommended by dental professionals for various periodontal diseases.

Conclusion

Ayurvedic mouthwash was effectually the same compared to 0.2% Chlorhexidine Gluconate mouthwash. It should be investigated thoroughly in terms of effectiveness, cost, and safety welfare on long-term usage, thus as an alternative for chlorhexidine mouthwash. Therefore, more studies are required to prove that Ayurvedic products can restore and conquer ordinary chlorhexidine.

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Table 1: Intragroup comparison of change in variables within each group

Variable	Groups	Baseline	3 weeks	6 weeks	p-value
PPD	Group A	6.50 ± 1.08	5.40 ± 1.08	4.70 ± 1.06	0.001*
	Group B	6.30 ± 1.16	4.50 ± 0.97	3.60 ± 0.70	0.001*
	Group C	6.50 ± 1.08	4.70 ± 1.06	3.70 ± 0.68	0.001*
PI	Group A	2.12 ± 0.24	1.82 ± 0.15	1.71 ± 0.18	0.001*
	Group B	2.18 ± 0.24	1.28 ± 0.11	1.08 ± 0.06	0.001*
	Group C	2.16 ± 0.25	1.28 ± 0.11	1.08 ± 0.06	0.001*
CAL	Group A	4.40 ± 1.17	3.40 ± 1.17	2.80 ± 0.79	0.001*

MSBI	Group B	4.20 ± 1.23	2.50 ± 0.97	1.60 ± 0.84	0.001*
	Group C	4.40 ± 1.08	2.60 ± 0.84	1.60 ± 0.70	0.001*
	Group A	0.73 ± 0.11	0.65 ± 0.11	0.59 ± 0.11	0.001*
	Group B	0.76 ± 0.12	0.59 ± 0.10	0.51 ± 0.10	0.001*
	Group C	0.82 ± 0.08	0.63 ± 0.08	0.49 ± 0.06	0.001*

* indicates significant difference at $p \leq 0.05$

Table 2: Intergroup comparison of change in variables within each group

Variable	Groups	Group A	Group B	Group C	p-value
PPD	Baseline	6.50 ± 1.08	6.30 ± 1.16	6.50 ± 1.08	0.897
	3 weeks	5.40 ± 1.08	4.50 ± 0.97	4.70 ± 1.06	0.145
	6 weeks	4.70 ± 1.06	3.60 ± 0.70	3.70 ± 0.68	0.011*
PI	Baseline	2.12 ± 0.24	2.18 ± 0.24	2.16 ± 0.25	0.847
	3 weeks	1.82 ± 0.15	1.28 ± 0.11	1.28 ± 0.11	0.001*
	6 weeks	1.71 ± 0.18	1.08 ± 0.06	1.08 ± 0.06	0.001*
CAL	Baseline	4.40 ± 1.17	4.20 ± 1.23	4.40 ± 1.08	0.906
	3 weeks	3.40 ± 1.17	2.50 ± 0.97	2.60 ± 0.84	0.109
	6 weeks	2.80 ± 0.79	1.60 ± 0.84	1.60 ± 0.70	0.002*
MSBI	Baseline	0.73 ± 0.11	0.76 ± 0.12	0.82 ± 0.08	0.148
	3 weeks	0.65 ± 0.11	0.59 ± 0.10	0.63 ± 0.08	0.499
	6 weeks	0.59 ± 0.11	0.51 ± 0.10	0.49 ± 0.06	0.044*