

COMPARISON OF HERBAL MOUTHWASH AND CHLORHEXIDINE EFFICACY IN PATIENTS WITH CHRONIC GENERALIZED PERIODONTITIS

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Abstract

Background: Ayurvedic drugs have been used since ancient times; oral rinses made from these are used in periodontal therapy. Triphala, Pilu, Nagavalli are one of these with antimicrobial action that minimizes plaque formation. The aim of the present study was to evaluate and compare the effects of Herbal mouthwash with Chlorhexidine in chronic generalized periodontitis.

Materials And Methods: Thirty patients with chronic generalized periodontitis of age group 35-55 were recruited for the study and randomly divided into three groups, group A – scaling and root planning and prescribed to use Chlorhexidine mouthwash, group B - patients treated with scaling and root planning group C – scaling and root planning and prescribed to use Herbal mouthwash. Patients were monitored for a period of 45 days. Plaque, Gingival and Periodontal Indices were recorded at Baseline, 7th, 30th and 45th day and the observations were statistically analyzed.

Results: One way ANOVA and General Linear model statistical analysis was done. There was a significant difference in Plaque and Gingival indices. Plaque and Gingival index for herbal mouth wash tend to decrease with increase in time periods. No significant decrease in Periodontal index for all time periods by the type of mouth wash.

Conclusion: This preliminary study proves that Herbal mouthwashes are as effective as chlorhexidine in plaque inhibition and reduction of gingival inflammation. So these ayurvedic preparations can be used in regular dental practice for prevention of plaque formation.

Keywords: Periodontitis, Mouth wash, Triphala, Chlorhexidine, Oral diseases.

Introduction

Ayurveda aims at ensuring a healthy mind and healthy body by not only providing cure of illness, but also elaborating the method for maintenance of health. In spite of vast development of modern medical science, satisfactory treatment of 'oral diseases' by newer drugs is not fully achieved, rather the chemical compounds has exposed the patients to its different ill effects, therefore, there is interest to find out effective remedy of any disease by harmless herbal drugs. This study is an attempt in that regard.¹ The primary way of prevention of oral diseases is plaque control and prevention of plaque accumulation on tooth and gingival surface. In fact mechanical plaque removal is the most effective way of preventing caries, gingivitis periodontitis and microbial systemic diseases. Mouthwashes are used to complete the process of mechanical plaque removal.²

Several antiplaque agents are being available in the market. However, due to several undesirable side effects associated with these agents stimulated the search for alternate agents.³ In recent years, there has been focus on plants or plant products used in folk dental practice or presumed in Unani, homeopathic or Ayurvedic remedies. Natural compounds contained in the herbal cocktail can act in a synergetic manner within the human body and can provide unique therapeutic properties with minimum or no undesirable side effects.⁴ The aim of the present study was to evaluate and compare the effects of Herbal mouthwash with Chlorhexidine in chronic generalized periodontitis.

Materials and Methods

The present study was conducted in outpatient Department of Periodontology, Rama Dental College Hospital & Research Centre in Kanpur, which included 30 patients with chronic generalized periodontitis of age group 35-55 years with probing depth of 3-6mm. Ethical clearance for the present study was obtained from the institutional Ethical Committee. The exclusion criteria included patients on antibiotic and anti-inflammatory drug therapy, patients on systemic disease, smokers, pregnancy and lactating mother, history of any periodontal treatment in previous 6 months. If the subject met all of the inclusion and exclusion criteria an informed consent was taken.

The subjects were randomly assigned to one of the 3 treatment groups:

Group A – treated with scaling and root planning and prescribed to use Chlorhexidine mouthwash

Group B – treated with scaling and root planning (SRP)

Group C – treated with scaling and root planning and prescribed to use Herbal mouthwash*

Clinical parameters: The following clinical parameters were recorded:

Plaque index according to Silness and Loe (1964)

Gingival index according to Loe H and Silness J (1963)

Russel's periodontal index (1956)

On baseline – Plaque index, Gingival index, Russels periodontal index was recorded and scaling and root planning was performed. In group A Chlorhexidine mouthwash was prescribed as an adjunct to SRP, in group B SRP was done, In group C Herbal mouthwash was prescribed as adjunct to SRP.

* HIORA-regular mouthwash Manufactured by the Himalaya Drug Company Makali, Bangalore 562123 (India).], each gram of HiOra * mouthwash containing Pilu (*Salvadora persica*) – 5.0 mg, Bibhitaka (*Terminalia bellerica*) – 10 mg, Nagavalli (*Piper betel*) – 10 mg, Gandhapura taila – 1.2 mg, Ela – 0.2 mg, Peppermint satva – 1.6 mg, Yavanisatva – 0.4 mg.

Patients were instructed to use mouthwash twice daily. The above mentioned indices were recorded on days 7, 30 and 45 respectively. The observations were statistically analyzed using descriptive statistics, ANOVA test.

Results

Group	Mean Values			
	Baseline	7 Days	30 Days	45 Days
Chlorhexidine	2.124	1.404	1.029	0.712
SRP	1.805	1.413	1.276	1.180
Herbal Mouth Wash	2.134	1.370	0.884	0.670
Results of One Way ANOVA				
F value	3.87*	0.09NS	12.27**	22.12**
p Value	0.0334	0.9150	0.0002	0.0000
Results of General Linear Model				
Wilk's Lambda	0.1739**			
p Value	0.0000			

*p < 0.05; **p < 0.01; NS – Not significant

TABLE 1: PLAQUE INDEX (PI) SCORE

One way ANOVA: Compares the group means of each measure, i.e., mean PI Scores for baseline, 7 days, 30 days and 45 days separately.

General Linear Model: Test the statistical significance of simultaneous differences in PI Scores of all time periods among the groups. That is, test the significant of the difference in combined scores of all four time period across groups.

From one way ANOVA results: There is a significant difference in PI scores of baseline, 30 days and 45 days across groups. From mean values, it is understood that it is less for Herbal Mouth Wash in 30 days and 45 days (it is less for 7 days also, but difference in group means is insignificant).

From General Linear Model: The Wilk's Lambda is used to identify the significance of the difference in combined scores across groups. Here, Wilk's lambda is highly significant at 1 per cent level ($p < 0.01$). So, there is a significant difference in combined PI scores of all time periods. Combining these results with low mean PI scores for Herbal mouth wash, it can be interpreted that PI score for Herbal mouth wash tend to decrease with increase in time periods.

Group	Mean Values			
	Baseline	7 Days	30 Days	45 Days
Chlorhexidine	2.124	1.586	1.145	0.793
SRP	1.888	1.517	1.272	1.141
Herbal Mouth Wash	2.270	1.487	0.883	0.620
Results of One Way ANOVA				
F value	4.91**	0.48NS	11.32**	17.76**
p Value	0.0152	0.6262	0.0003	0.0000
Results of General Linear Model				
Wilk's Lambda	0.1321**			
p Value	0.0000			

** $p < 0.01$; NS – Not significant

TABLE 2: GINGIVAL INDEX (GI) SCORE

One way ANOVA: Compares the group means of each measure, i.e., mean GI Scores for baseline, 7 days, 30 days and 45 days separately.

General Linear Model: Test the statistical significance of simultaneous differences in GI Scores of all time periods among the groups. That is, test the significant of the difference in combined scores of all four time period across groups.

From one way ANOVA results: There is a significant difference in GI scores of baseline, 30 days and 45 days across groups. From mean values, it is understood that it is less for Herbal Mouth Wash in 30 days and 45 days (it is less for 7 days also, but difference in group means is insignificant).

From General Linear Model: The Wilk's Lambda is used to identify the significance of the difference in combined scores across groups. Here, Wilk's lambda is highly significant at 1 per cent level ($p < 0.01$). So, there is a significant difference in combined GI scores of all time periods. Combining this results with low mean GI scores for Herbal mouth wash, it can be interpreted that GI score for Herbal mouth wash tend to decrease with increase in time periods.

Group	Mean Values			
	Baseline	7 Days	30 Days	45 Days
Chlorhexidine	4.397	4.198	3.588	3.494
SRP	3.954	3.872	3.289	3.285
Herbal Mouth Wash	3.958	3.947	3.154	3.154
Results of One Way ANOVA				
F value	1.99 ^{NS}	0.87 ^{NS}	1.80 ^{NS}	1.20 ^{NS}
p Value	0.1564	0.4306	0.1843	0.3157
Results of General Linear Model				
Wilk's Lambda	0.6835 ^{NS}			
p Value	0.2877			

$p > 0.05$ - Not significant (NS)

TABLE 3: PERIODONTAL INDEX SCORE

No significant difference in Periodontal Index either for each time period or simultaneously for all time periods by type of mouthwash.

Discussion

Human dental plaque was one of the ecosystems in which maximum number of microorganism were first observed. Dental plaque refers to the aggregates of bacterial cell embedded in a polysaccharide and protein matrix which adheres to the teeth.⁴

Several antiplaque agents are being available in the market. However, with the rise in bacterial resistance to antibiotics, there is considerable interest in the development of other classes of antimicrobials for the control of infection.⁵ Current advancement in drug discovery technology and search for novel chemical diversity have intensified the efforts of exploring products from Ayurveda the traditional system of medicine in India.

This clinical study aimed to compare the inhibition of plaque formation by SRP, Herbal mouthwash and Chlorhexidine. Chlorhexidine was developed in 1940s by Empirical chemical industries, England and marketed in 1954 as an antiseptic for skin wounds.⁶ Use in dentistry was initially for presurgical disinfection of the mouth and in endodontics. Plaque inhibition by Chlorhexidine was first investigated in 1962 but the definitive study was performed by Loe and Schiott in 1970.⁷ Chlorhexidine was selected as the test substance because it is best characterised and most effective chemical antiplaque agent.

The importance of biofilm disruption prior to the initiation of Chlorhexidine regimen was investigated by Brownstein et al.⁸ They compared the effects of rinsing with 0.12% Chlorhexidine gluconate in sites with and without initial prophylaxis (split mouth design) in individuals with pre-established gingivitis. CHX group showed better reduction in clinical parameters than in control group, this can be explained by study done by Fabrico B et al – Chlorhexidine had better reduction in GBI, plaque index in patients who were given Chlorhexidine as an adjunct to oral prophylaxis than in control group. There was significant reduction in Gingival bleeding in Chlorhexidine group- this might be attributed to substantivity of Chlorhexidine within oral cavity.⁶ In a study done by Loe H et al Chlorhexidine showed significant reduction in development of dental plaque and gingivitis in subjects.⁹

Herbal extracts are also potent inhibitors of pathologically elevated collagenases and hence may be used as an alternative adjunct in the management of periodontal disease.¹⁰ The Herbal mouthwash that was used for the study acts on the tooth and have protective antimicrobial activities. It contains Lavanga (*Syzygium aromaticum*) which is a natural source of eugenol, exhibits mild local anaesthetic and analgesic effect. Triphala, which is a natural source of polyphenols, inhibits PMN-induced matrix metalloproteinases (MMP) in chronic periodontitis. Pilu (*Salvadora persica*) which is a natural source of hydroxychavicol, exhibits strong antimicrobial action, and is effective against oral pathogens. Suryakshara is a natural source of potassium nitrate which desensitizes the nerves of the teeth, and blocks the transmission of pain in sensitive teeth. Tulasi (*Ocimum sanctum*) is a natural source of eugenol, and

acts as an effective natural antimicrobial agent against oral pathogens. Bibhitaka (*Terminalia bellerica*) is a natural source of gallic acid, exhibits potent astringent action, and thus help in toning the gums. All these in combination exhibit synergetic effect which helps to maintain the oral health.

In our study a statistically significant difference was noted in reduction of Plaque and Gingival indices in Chlorhexidine and Herbal group when compared to SRP group. These results are in accordance with the study done by southern et al¹⁰ who compared 0.12% Chlorhexidine and herbal oral rinse in dental plaque induced gingivitis. Russel's periodontal index showed no significant reduction in all three groups.

Conclusion

This study was conducted for comparing the effectiveness of the plaque inhibitory properties of alternative herbal medicine with chlorhexidine which is considered as gold standard. This preliminary study proves that Herbal mouthwashes are as effective as chlorhexidine in plaque inhibition and reduction of gingival inflammation. So these ayurvedic preparations can be used in regular dental practice for prevention of plaque formation. Further, longterm clinical studies are recommended to the scientific community for making ayurvedic products as part of regular dental practice.

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Conflict of interest: None

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