



Comparison of the Efficacy of Two Different Mouthwashes in Gingivitis Patients: A Clinical Study

JERRY STEPHENS¹, MARY PETERS¹, SONAM KAPOOR², RAMIT SRIVATAVA³

INTRODUCTION: Adequate plaque control becomes essential for reducing the progression of periodontal disease. Plaque management consists several mechanical procedures and chemical agents that retard the formation of plaque.

AIM: To compare clinical outcomes of chlorhexidine gluconate mouthwash and Hiora herbal mouthwash in gingivitis patients.

MATERIALS AND METHOD: The study was conducted among 30 patients. Patients were randomly divided into two groups, Group I used Chlorhexidine mouthwash and Group II received Hiora mouthwash. Clinical parameters such as Plaque Index (PI), Gingival Index (GI), Probing depth (PD) and Clinical Attachment Loss (LA) were recorded just before initiation of oral prophylaxis. After completion of oral prophylaxis, patients were advised to use mouthwash and were recalled after two weeks for further recording of clinical parameters. The collected data was thus statistically analysed to arrive at the results using SPSS version 24.0 and applying the student's t-test

RESULTS: Both the groups reported significant improvement in clinical parameters. When two mouthwashes were compared, a statistically significant difference in the mean value of PI (0.02) and GI (0.01), CAL and PD between the two experimental groups whereas no significant differences were observed before and after therapeutic interventions.

CONCLUSION: The study concluded that herbal mouthwash are comparably effective in comparison to other conventional mouthwash in controlling dental biofilm

KEYWORDS: Plaque Control, Gingivitis, Chlorhexidine

INTRODUCTION

Gingivitis is a site-specific inflammatory condition that is initiated by accumulation of biofilm. A peculiar feature of plaque-induced gingivitis is that there is complete reversibility of the tissue alterations once the main etiology i.e. biofilm is adequately removed.¹ Therefore, adequate plaque control becomes essential for reducing the progression of periodontal disease. Plaque management consists several mechanical procedures and chemical agents that retard the formation of plaque. Chemical plaque control should be used only as an adjunct but not as a replacement to the mechanical means of plaque control.

The antibacterial activity should be obtained without using antibiotics and maintaining the native oral microflora to compete with disease-producing microflora. Mouthwashes, one of the chemical antipaque agents, solve the purpose.² At the moment, the best antiseptic for the oral cavity is Chlorhexidine.

It is a biguanide which possesses both bactericidal and bacteriostatic activity. CHX mouth rinses should be used at least 30 min after other chemical plaque agents as its activity is pH dependent i.e. mouth pH could be influenced from anionic surfactants commonly used as detergents in toothpastes and mouthwashes.³ Despite its benefits, Chlorhexidine has some disadvantages too. It is unpleasant in taste and alters taste sensation. Chlorhexidine is non-toxic but affects the mucous membrane, tongue, and causes brown stains on the teeth.⁴ To counteract the side effects of chemical containing mouthwashes, several herbal mouthwashes made from plant extracts are also available in the market.

Hiora mouthwash is the product of "The Himalaya Drug Company", India. In 1 g mouthwash solution, it contains 5 mg pilu (*Salvadora persica*), 10 mg Bibhitaka (*Terminalia bellirica*), 10 mg Nagavalli (*Piper betle*), 1.2



© Jerry Stephens et al. This is an open access article distributed under the terms of the Creative Commons Attribution License CC-BY-NC 4.0, which permits unrestricted use, distribution and reproduction in any medium, provided the use is not commercial and the original author(s) and source are cited.

Submitted on: 17-Dec-2022; Accepted on: 24-Jun-2023

mg Gandhapura taila (wintergreen oil), 0.2 mg ela, 1.6 mg peppermint satva, and 0.4 mg Yavani satva. Belleric Myrobalan (Bibhitaki) is known for its antimicrobial properties. Betel (Nagavalli) helps in prevention of halitosis. Meswak (*S. persica*) is known as a tooth cleaning agent.⁵ Therefore, the aim of this study was to clinically compare the effects of chlorhexidine and Hiora mouthwashes in gingivitis patients.

MATERIALS AND METHOD

The study was carried out on thirty patients having gingivitis. The patients were divided into two groups. Through random assignment (flip of coin). Group I patients were prescribed with 0.2% Chlorhexidine mouthwash, 10ml twice daily at 12 hour interval for 2 weeks and Group II patients were prescribed with Hiora mouthwash, 10ml twice daily at 12 hour interval for 2 weeks. Patients were advised not to rinse their mouth further for half an hour. Pre-operative clinical parameters such as Plaque Index (PI), Gingival Index (GI), Probing depth (PD) and Clinical Attachment Loss (LA) were recorded before oral prophylaxis and two weeks thereafter. The collected data was statistically analysed by applying the student's t-test in SPSS version 25.0 to find out significant differences, if any.

RESULTS

The study sample consisted of 30 patients, 15 patients in each Group I and II, respectively.

Intragroup comparison - Group A: The mean value of PI before interventions was 2.35 ± 0.36 , whereas the mean value after interventions was 1.76 ± 0.25 (0.02^*). The mean value of GI before interventions was 1.44 ± 0.24 and after interventions were 1.17 ± 0.14 . The mean value of pre-operative CAL was found to be 0.78 ± 0.22 , whereas the mean value of post-operative was 0.61 ± 0.36 . The mean value of pre-operative PD was 1.32 ± 0.34 and post-operative mean value was 1.13 ± 0.16 as shown in Table 1.

Intragroup comparison - Group B: The mean value of pre-operative PI was 1.74 ± 0.31 and post-operative was 1.52 ± 0.26 . The mean value of pre-operative GI was 1.63 ± 0.20 and post-operative was 1.55 ± 0.19 . The mean value of pre-operative CAL was 0.77 ± 0.45 and post-operative mean value was 0.61 ± 0.29 . The mean value of pre-operative PD was 1.37 ± 0.39 and post-operative was 1.01 ± 0.28 as shown in Table 2.

Intergroup comparison (Group A and B): Intergroup comparison was performed between group

GROUP I	Mean±SD	p- Value
PI	2.35 ± 0.36	0.02*
PI (After 2 weeks)	1.76 ± 0.25	
GI	1.44 ± 0.24	NS
GI (After 2 weeks)	1.17 ± 0.14	
CAL	0.78 ± 0.22	0.03*
CAL (After 2 weeks)	0.61 ± 0.36	
PD	1.32 ± 0.34	NS
PD (After 2 weeks)	1.13 ± 0.16	

Table 1. The comparison of pre-operative and post-operative mean values of PI, GI, CAL and PD in Group I (NS: Non Significant)

I and Group II to compare the clinical outcomes of chlorhexidine mouthwash and Hiora mouthwash.

Further analysis of the results revealed a statistically significant difference in the mean value of PI (0.02) and GI (0.01), CAL and PD between the two experimental groups whereas no significant differences were observed before and after therapeutic interventions (Table 3).

GROUP II	Mean±SD	p- Value
PI	1.74 ± 0.31	0.01*
PI (After 2 weeks)	1.52 ± 0.26	
GI	1.63 ± 0.20	0.04*
GI (After 2 weeks)	1.55 ± 0.19	
CAL	0.77 ± 0.45	NS
CAL (After 2 weeks)	0.61 ± 0.29	
PD	1.37 ± 0.39	NS
PD (After 2 weeks)	1.01 ± 0.28	

Table 2. The comparison of pre-operative and post-operative mean values of PI, GI, CAL and PD in Group II. (NS: Non Significant)

DISCUSSION

Removal of dental biofilm is an important aspect in treating periodontal disease. Removal of biofilm can be

GROUPS	n	Mean±SD	p-value
Pre PI			
Group I	15	2.35±0.36	NS
Group II	15	1.74±0.31	
Pre GI			
Group I	15	1.44±0.24	NS
Group II	15	1.63±0.20	
Pre CAL			
Group I	15	0.78±0.22	NS
Group II	15	0.77±0.45	
Pre PD			
Group I	15	1.32±0.34	NS
Group II	15	1.37±0.39	
Post PI			
Group I	15	1.76±0.25	0.02*
Group II	15	1.52±0.26	
Post GI			
Group I	15	1.17±0.14	0.01*
Group II	15	1.55±0.19	
Post CAL			
Group I	15	0.61±0.36	NS
Group II	15	0.61±0.29	
Post PD			
Group I	15	1.13±0.16	NS
Group II	15	1.01±0.28	

Table 2. The comparison of pre-operative and post-operative mean values of PI, GI, CAL and PD in Group II. (NS: Non-Significant)

successfully achieved by mechanical and chemical means of plaque control. As an adjunct to mechanical plaque control i.e. toothbrushing, many chemical antiplaque agents are also effective, provided they are used in combination with mechanical aids.

Mouthwashes are easy to use chemical agents for biofilm control. Chlorhexidine is considered to be the “gold standard” antiplaque mouthwash majorly because of its prolonged broad-spectrum antimicrobial activity and inhibitory effect on biofilm.⁶ It also exhibits excellent antiplaque activity and prolonged

substantivity.⁷ This study reported significant reduction in plaque scores in group using chlorhexidine and these results are in accordance with other studies showing similar effects of chlorhexidine mouthwash on plaque scores.^{8,9} Chlorhexidine mouthwash usage leads to inhibition of bacterial accumulation.^{10,11}

A similar study was also done to compare the antiplaque efficacy of herbal and chlorhexidine gluconate mouthwash and reported no significant difference in the gingival index and plaque index scores.¹² Similar results were also reported in a study conducted where 90 patients divided into three groups; Normal saline group, Chlorhexidine group and Hiora mouthwash group. They reported that Chlorhexidine and Hiora mouthwash were superior to normal saline but between Chlorhexidine and Hiora group there was non-significant improvement.¹³ Another study compared efficacy of a commercially available herbal mouthwash (HiOra) with that of an essential oil-containing mouthwash, Listerine. From the results of the study, they concluded that both mouthwashes yielded comparable results in plaque reduction, thus highlighting the role of herbal mouthwash as a potent antiplaque agents.¹⁴

CONCLUSION

Results from this study concludes that both Chlorhexidine and Hiora mouthwash are equally effective in gingivitis when used as an adjunct with mechanical plaque control and no statistically significant difference was observed between two groups.

REFERENCES

1. Tombelli L, Farina R, Silva CO, Tatakis DN. Plaque-induced gingivitis: Case definition and diagnostic considerations. *J Periodontol* 2018;89(Suppl 1):S46-S73.
2. Tartaglia GM, Kumar S, Fornari CD, Corti E, Connelly ST. Mouthwashes in the 21st century: a narrative review about active molecules and effectiveness on the periodontal outcomes. *Expert Opin Drug Deliv* 2017;14(8):973-82.
3. Russell AD, Day MJ. Antibacterial activity of chlorhexidine. *J Hosp Infect* 1993;25:229-38.
4. Flotra L, Gjemo P, Rolla G, Waerhaug J. Side effects on chlorhexidine mouthwashes. *Eur J Oral Sci* 1971;79:119-25.
5. Khobragade GR, Vishwakarma P, Dodamani AS, Kshirsagar MM, Raut SN, Deokar RN. Herbal mouthwash for the management of oral diseases: A

review on the current literature. *J Oral Health Comm Dent.* 2021;15(2): 70-7.

6. American Dental Association's Council on Dental Therapeutic Guidelines for Acceptance of Chemotherapeutic Product for Control of Supragingival Dental Plaque and Gingivitis. *J Am Dent Assoc.* 1986;11:529-32.

7. Charles CA, McGuire JA, Sharma NC, Qaqish J. Comparative efficacy of two daily use mouthrinses: Randomized clinical trial using an experimental gingivitis model. *Braz Oral Res.* 2011;25:338-44.

8. Lang NP, Catalantto FA, Knopfi RU. Quality specific taste impairment following the application of chlorhexidine mouthrinses. *J Clin Periodontol.* 1988;15:43-8.

9. Haq MW, Batool M, Ahsan SH, Sharma G. Efficacy of anti-plaque mouthwashes: A five-day clinical trial. *Gen Dent.* 2011;59:110-5.

10. Loe H, Schiott CR. The effect of mouthrinses and topical application of chlorhexidine on the development of dental plaque and gingivitis in man. *J Periodont Res* 1970;5:79-83.

11. Garg J, Rg SM, Sinha S, Ghambhir S, Abbey P, Jungio MP. Antimicrobial Activity of Chlorhexidine and Herbal Mouthwash Against the Adherence of Microorganism to Sutures After Periodontal Surgery: A Clinical Microbiological Study. *Cureus.* 2022;14(12):e32907.

12. Prasad KA, John S, Deepika V, Dwijendra KS, Reddy BR, Chincholi S. Anti-Plaque Efficacy of Herbal and 0.2% Chlorhexidine Gluconate Mouthwash: A Comparative Study. *J Int Oral Health.* 2015;7(8):98-102.

13. Parwani SR, Parwani RN, Chitnis P J, Dadlani HP, Sai Prasad SV. Comparative evaluation of anti-plaque efficacy of herbal and 0.2% chlorhexidine gluconate mouthwash in a 4-day plaque re-growth study. *J Indian Soc Periodontol* 2013;17:72-7.

14. Gill S, Kapoor D, Singh J, Nanda T. Comparison of Antiplaque Efficacy of Commercially Available HiOra (Herbal) Mouthwash with Listerine Mouthwash: A Clinical Study. *J Periodontol Implant Dent.* 2017;9(2): 53-7.

Cite this article as:

Stephens J, Peters M, Kapoor S, Srivastava R. Comparison of the Efficacy of Two Different Mouthwashes in Gingivitis Patients: A Clinical Study. *Int Healthc Res J.* 2023;7(3):OR6-OR10. <https://doi.org/10.26440/IHRJ/0703.06594>

AUTHOR AFFILIATIONS: (*Corresponding Author)

1. Dental Practitioners, Colombo, Sri Lanka
2. M. Pharm, Consultant pharmacist, Indore, Madhya Pradesh, India
3. Srivatava Dental Hub, Bhagalpur, Bihar, India

Source of support: Nil, **Conflict of interest:** None declared

Contact Corresponding author at: editor[dot]ihrj[at]gmail[dot]com