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Comparative Evaluation of Different Herbal Mouthwash with Chlorhexidine on Plaque and Gingivitis

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ABSTRACT

Introduction: Due to several drawbacks of Chlorhexidine (CHX), search for an alternative and the potentially safe anti-plaque agent has led to the emergence of alternative products.

Objectives: This study was done to assess the efficacy of green tea and Triphala herbal mouth wash over CHX mouthwashes on gingival health of healthy individuals.

Methods: This study consisted of a total of 45 participants with 15 in each group; group I: chlorhexidine, Group-II-green tea and Group -III with Triphala mouth wash. All healthy participants in the age group of 20-25 years received complete supragingival scaling at baseline. All the groups are advised to use particular mouth rinse for 14 days' and gingival index and plaque index was recorded at baseline and after 14 days. The obtained data were subjected to statistical analysis.

Results: CHX showed lower gingival and plaque score after 14 days, while green tea had comparable results with chlorhexidine. But Triphala mouth was had lower values compared to the other two groups.

Conclusion: Herbal (green tea and Triphala) mouthwashes can prove to be effective alternatives to CHX with minimal side effects.

Key Words: Chlorhexidine, Gingival Status, Green Tea, Herbal Mouthwash, Plaque status, Triphala

INTRODUCTION

Dental caries and periodontal diseases two most common dental disease caused by dental plaque which is a complex microbial community. ¹ Thus, plaque control should be an essential part of oral hygiene measures. Tooth-brushing, when performed correctly, results in effective plaque control. However, mechanical plaque control methods have some inherent limits.² Therefore, chemical plaque control methods such as the use of mouthwash have been recommended as an additional therapeutic approach.³ To date Chlorhexidine (CHX), is considered the most efficient anti-plaque agent, but with some limitations. ^{4,5,6} Hence, search for an alternative to CHX mouthwash has led to the introduction of various herbal products in dentistry which are without any major side effects.⁶ Natural herbs when used in

mouthwashes, have shown significant advantages over the chemical ones.^{7,8}

Green tea (*Camellia sinensis*) is one of the most commonly consumed beverages worldwide containing several bioactive chemicals, and it is particularly rich in flavonoids which include catechins. Catechins present in green tea contain epigallocatechin gallate (EGCG), epicatechin, epicatechin gallate, and epigallocatechin. Green tea also contains carotenoids; tocopherols; ascorbic acid (Vitamin C); minerals such as Se, Cr, Zn or Mn; and certain phytochemical compounds. The most plentiful polyphenolic compound EGCG is thought to contribute to the beneficial effects of tea. Green tea with active chemical ingredients possesses diverse pharmacological properties which are linked to lower incidence of some pathological conditions including dental caries, oral

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cancer, obesity, cardiovascular diseases, and stroke. Hence, green tea was used in our study to test its effectiveness.⁹

Triphala has been used in Ayurveda in the Indian Method of Medicine, which is a Rasayana Drug; a mixture of three herbal products, i.e., *Terminalia bellirica*, *Terminalia chebula*, and *Embilica officinalis*, has been shown to exhibit strong antioxidant, anti-inflammatory, immunomodulatory, analgesic, anti-metastatic properties, astringent, etc.¹⁰

The present study was done to compare the effectiveness of herbal (green tea and Triphala) mouth with that of CHX on plaque accumulation, gingivitis.

MATERIALS AND METHOD

The present study was conducted in the Department of Periodontology. Ethical clearance for the present study was obtained from the Institutional Ethical Committee. Total of 60 healthy patients in the age group of 20-25 years of both the genders was included in the study. Samples were divided into 3 test group with 20 samples in each group; group-1 chlorhexidine, group-2: green tea, and group-III: Triphala mouth was. The inclusion criteria were healthy individuals who willing to participate in the study. Exclusion criteria were, subjects with underlying medical conditions, smoking or tobacco habit, wearing orthodontic appliances, malaligned teeth, subjects with chronic or aggressive periodontitis and who are not willing to participate. For sample distribution, the random allocation sequence was generated by one of the investigators employing random number table method.

All participants were advised to rinse mouth daily after brushing with one of the 3 mouth rinses for 14 days. Plaque and the gingival score was recorded for all participants at baseline and after 14 days of mouth rinse using Plaque Index (PI) described by Silness and Loe in 1964 and Gingival Index (GI) described by Loe and Silness in 1963 to assess gingival status. The subjects were asked not to eat or drink anything for the next half an hour to achieve the effect of the mouthwash. Blinding: The blinding and concealment were controlled by a third person (pharmacist of dental college) who distributed mouthwashes in plain plastic bottles of the same size identified as Group A Group B, and Group C.

Method of preparation of green tea mouthwash

Commercially available green tea was freshly prepared each time by mixing green tea powder with plain water and boiled and used as a mouth rinse.

Preparation of Triphala (TRP) mouthwash

Triphala is available as a finely filtered powder form called churna. In our study, 6% Triphala mouthwash was prepared by dissolving sixty grams of pure Triphala churna in 1 litre of distilled water. To increase patient acceptance, 2 mL of

glycerin (sweetening agent) and 1 mL of Pudina Hara (flavouring agent) were added to the solution. Then the solution was boiled for 10 min, cooled and filtered.

The data obtained were subjected to statistical analysis using SPSS 20.0 with ANOVA test. Significance was assessed at 5% level of significance ($p < 0.05$).

RESULTS

Table 1 indicates the Plaque score at baseline and after 14 days. In group I plaque score was 1.712 ± 0.137 at baseline and 1.062 ± 0.061 after 14 days, similarly, 1.523 ± 0.245 , 1.534 ± 0.225 at baseline and 1.165 ± 0.167 , 1.243 ± 0.117 after 14 days' form green tea and Triphala mouth wash respectively. There was a reduction in plaque score from baseline to after 14 days in all the tested groups.

Table 2 indicates the gingival score at baseline and after 14 days. In group I gingival score was 2.112 ± 0.237 at baseline and 1.152 ± 0.161 after 14 days, similarly 2.083 ± 0.125 , 2.085 ± 0.183 at baseline 1.345 ± 0.056 , 1.536 ± 0.152 after 14 days' form green tea and Triphala mouth wash respectively. There was a reduction in gingival score from baseline to after 14 days in all the tested groups. There was a significant reduction of the gingival score with chlorhexidine compared to other groups.

DISCUSSION

The present study was conducted to determine the effectiveness of green tea and Triphala mouth rinse with chlorhexidine on plaque accumulation, gingival health. Mehta et al. compare the efficacy of a commercially available homeopathic mouthwash with chlorhexidine on plaque status, gingival status, and salivary *Streptococcus mutans* count. They concluded that Freshol was found to be better than chlorhexidine in reducing the salivary *mutans streptococci* count.¹¹

Khobragade et al. determine and compare the antibacterial efficacy of indigenous herbal mouthwash with 0.2% chlorhexidine gluconate. After the use of herbal mouthwash as well as 0.2% chlorhexidine gluconate, there was a significant reduction in both clinical and microbiological parameters.¹²

Deshmukh et al. evaluated the efficacy of probiotics, herbal and chlorhexidine (CHX) mouthwashes on gingival health of healthy individuals. They found that there were no significant difference in the efficacy of CHX, HiOra regular and probiotic mouthwashes on plaque accumulation, gingival health and oral hygiene status.¹³ Mani et al. did a meta-analysis on mouthwash war; Chlorhexidine vs. Herbal mouth rinses and concluded that only two studies favor the use of herbal products and four studies favor the use of chlorhexidine.¹⁴

Singh et al. compared and evaluated the effects of commercially available green tea mouthwash with chlorhexidine mouthwash on gingivitis. There was a reduction in the gingivitis scores of the participants using green tea mouthwash as compared to chlorhexidine mouthwash and distilled water.⁹ Similar finding were seen in our results.

Prabakar et al. compared the effectiveness of probiotics, green tea, and CHX- and fluoride-containing dentifrices on oral microbial flora. All the tested groups displayed antimicrobial activity by bringing about a substantial decrease in the mean *S. mutans* and *Lactobacillus* colony counts at the 30th day of follow-up.¹⁵ Shah et al. compared the efficacy of probiotic and chlorhexidine oral rinses in orthodontic patients. They concluded that probiotics are as effective as chlorhexidine as an adjunctive chemical plaque control agent.¹⁶ Penmetsa et al. assessed the effectiveness of two herbal types of mouthwash in comparison with Chlorhexidine mouthwash on gingivitis. They concluded that Triphala to be superior in the reduction of gingival inflammation, plaque, and bleeding compared to that of *A. vera*. However, the results of our study also indicated that Triphala was comparably effective.¹⁰

The present study showed a reduction in plaque and gingival score with herbal and chlorhexidine mouth rinse. Green tea showed comparable results with chlorhexidine.

The drawback of our study was a smaller sample size and only 3 products were evaluated. Further studies are required on larger samples size.

CONCLUSION

This study, suggest that herbal alternatives like green tea can prove to be effective or alternative to chlorhexidine in improving oral health. Triphala is also effective in the reduction of plaque and gingivitis.

Conflict of interest: Nil

Source of funding: Self

Authors Contribution

1. Shreyas N Shah - editing
2. Ravi S - investigation
3. Madhumala R- data collection
4. Sharma S-- manuscript writing
5. Ganesh NS- editing
6. Manovijay B - analysis
7. Jayachandran D- evaluation

REFERENCES

1. Marsh PD. Dental plaque as a biofilm and a microbial community – implications for health and disease. BMC Oral Health 2006;6(Suppl 1):S14.

2. Harris NO, Garcia-Godoy F, Nathe CN. Primary Preventive Dentistry. 8th ed. USA: Pearson; 2013.
3. Aneja KR, Joshi R, Sharma C. The antimicrobial potential of ten often used mouthwashes against four dental caries pathogens. Jundishapur J Microbiol 2010;3(1):15–27.
4. Farah CS. Mouthwashes. Aust Prescr. 2009;32:162–164.
5. Malhotra R, Grover V, Kapoor A, Saxena D. Comparison of the effectiveness of a commercially available herbal mouth rinse with CHX gluconate at the clinical and patient level. J Ind Soc Periodontol 2011;15:349–352.
6. Nagappan N, John J. Antimicrobial efficacy of herbal and CHX mouth rinse- A systematic review. J Dent Med Sci 2012;2(4):5–10.
7. Amruthesh S. Dentistry and Ayurveda- III (basics - ama, immunity, Ojas, rasas, etiopathogenesis and prevention.) Ind J Dent Res 2007;18:112–119.
8. Khairnar MR, Karibasappa GN, Dodamani AS, Vishwakarma P, Naik RG, Deshmukh MA. Comparative assessment of Cranberry and CHX mouthwash on streptococcal colonization among dental students: A randomized parallel clinical trial. Cont Clin Dent. 2015;6(1):35–39.
9. Singh O, Reddy VK, Pradhan D, Sharma L. Comparative evaluation of green tea and chlorhexidine mouthwashes on gingivitis: A randomized controlled trial. J Ind Assoc Public Health Dent 2019;17:269-274
10. Penmetsa GS, Vivek B, Bhupathi AP, Sudha Rani P, Subbareddy B V, Ramesh M V. Comparative Evaluation of Triphala, *Aloe vera*, and chlorhexidine mouthwash on gingivitis: A randomized controlled clinical trial. Contemp Clin Dent 2019;10:333-337.
11. Mehta S, Pesapathy S, Joseph M, Tiwari PK, Chawla S. Comparative evaluation of a herbal mouthwash (Freshol) with chlorhexidine on plaque accumulation, gingival inflammation, and salivary *Streptococcus mutans* growth. J Int Soc Prev Comm Dent 2013; 3(1): 25–28.
12. Khobragade VR, Vishwakarma PY, Dodamani AS, Jain VM, Mali GV, Kshirsagar MM. Comparative evaluation of indigenous herbal mouthwash with 0.2% chlorhexidine gluconate mouthwash in the prevention of plaque and gingivitis: A clinico-microbiological study. J Indian Assoc Pub Heal Dent 2020;18:111-117.
13. Deshmukh MA, Dodamani AS, Karibasappa G, Khairnar MR, Naik RG, et al. Comparative Evaluation of the Efficacy of Probiotic, Herbal and Chlorhexidine Mouthwash on Gingival Health: A Randomized Clinical Trial. J Clin Diagn Res 2017;11(3): ZC13-ZC16.
14. Manipal S, Hussain S, Wadgave U, Duraiswamy P, Ravi K. The Mouthwash War - Chlorhexidine vs. Herbal Mouth Rinses: A Meta-Analysis. J Clin Diagn Res 2016;10(5): ZC81–ZC83.
15. Prabakar J, John J, Arumugham IM, Kumar RP, Sakthi DS. Comparing the effectiveness of probiotic, green tea, and chlorhexidine- and fluoride-containing dentifrices on oral microbial flora: A double-blind, randomized clinical trial. Contemp Clin Dent 2018;9:560-569.
16. Shah SS, Nambiar S, Kamath D, Suman E, Unnikrishnan B, et al. Comparative Evaluation of Plaque Inhibitory and Antimicrobial Efficacy of Probiotic and Chlorhexidine Oral Rinses in Orthodontic Patients: A Randomized Clinical Trial. Inter J Dent 2019:1964158.

Table 1: Plaque score at baseline and after 14 days

Group	Baseline score	After 14 days	Amount of reduction	P
Group -1: Chlorhexidine	1.712±0.137	1.062±0.061	0.092±0.076	0.001
Group II: Green tea	1.523±0.245	1.165±0.167	0.358±0.078	0.001
Group III:Triphala	1.534±0.225	1.243±0.117	0.291±0.108	0.05

P=0.001

Table 2: Gingival score at baseline and after 14 days

Group	Baseline score	Final score	Amount of reduction	P
Group -1: Chlorhexidine	2.112±0.237	1.152±0.161	0.960±0.076	0.001
Group II:	2.083±0.125	1.345±0.056	0.738±0.069	0.001
Group III:	2.085±0.183	1.536±0.152	0.549±0.031	0.05

P=0.001