The Effect of Triphala and Chlorhexidine Mouthwash on Dental Plaque and Gingival Inflammation

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Abstract

Introduction: Mechanical removal of plaqueby means of brushing and flossing is time-consuming and is also technique sensitive. Hence, effective plaque control of 100% may not be rendered always by these techniques. Adjuncts in the form of medication or mouthwashes are always recommended to assist tooth brushing in plaque control. The use of herbal mouthwashes has been a boon to control the oral health-related problems. Triphala is one of the best-known combinations used for various ailments in Ayurveda. The present study is thus aimed at comparing chlorhexidine and triphala,asan anti-plaque agent, and for treating gingivitis among adult patients.

Materials and Methods: A total of 210 patients were randomly divided into three groups:

Group 1: Chlorhexidine (0.2%)

Group 2: Triphala (0.6%)

Group 3: Control group with no mouthwash.

The examinations were done at baseline, 7 days, and 15 days using the gingival index and plaque index.Chi-square test was used to compare the inter- and intra-group findings usingSPSS 20.0 (Chicago, U.S.A).

Results: Even though a higher percentage of patients showed greater improvement with Group 2 intervention than Group 1, the difference was not found to be statistically significant after 7 days of observation. After 15 days, the Group 2 patients showed lesser plaque accumulation compared to Group 1, yet this difference was not found to be statistically significant. With respect to gingivitis, even though more patients were showed improvement with respect toGroup 2 than Group 1 after 7 days and 15 days of observation, the difference was not found to be significant. Overall, the intervention with triphala provided better results than with chlorhexidine, but this was not statistically significant.

Conclusion: Triphala and chlorhexidine help as an adjunct to toothbrushing for the control of plaque and resultant gingivitis. Triphala can be used as a substitute to avoid the side effects of the long-term use of chlorhexidine.

Keywords: Chlorhexidine, gingivitis, plaque, triphala.

Introduction

The Indian distribution of medical and dental care is uneven in nature with limited accessibilityto especially dental treatments for the population concentrated in the rural areas. The financial burden coupled with lack of knowledge and interest regarding oral health is an essential contributing factor to the occurrence of oral diseases. Home-based care as a part of maintenance and prevention stands out to be the only effective way out [1]. Dental caries and gingivitis are universal problems that have a higher prevalence across the globe. Loeet al. stated that accumulation of microbial plaque results in the development of gingivitis and its removal and control results in resolution of the lesions inhumans [2].The presence of the local irritating factor,plaque, renders the gingival tissue in a constant state of inflammation resulting in gingivitis, characterized by bleeding from gums, swelling and, at times in severe cases, pus discharge. This,when left untreated, can proceed to periodontitis [3, 4, 5]. Mechanical removal of plaque by means of brushing and flossing is time-consuming and is also technique sensitive. Hence, effective plaque control of 100% may not be rendered always by these techniques. Adjuncts in the form of medication or mouthwashes are always recommended to assist toothbrushing in plaque control. Conventionally, chlorhexidine is used as an antiplaque agent, but it has its own drawbacks related to staining of teeth and also resistance developed by the microbes after prolonged usage [4]. Herbal mouthwashes have the ability to sustain themselves and to avoid the complications. The use of herbal mouthwashes has been a boon to control the oral health-related problems. Triphala is one of the best-known combinations used for various ailments in Ayurveda [1]. Triphala

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mouthwash is formulated with traditional botanicals and essential oils to freshen the breath. Triphala is a traditional Ayurvedic formulation consisting of three fruits: Amla, Harada, and Behada. Triphala mouthwash is sweetened with xylitol, which does not promote tooth decay.Its use as an agent for controlling plaque and its resultant effect on gingivitis has been very limitedly explored, and few literature evidences are available with respect to the same. The present study is thus aimed at comparing chlorhexidine and triphala,asan anti-plaque agent, and for treating gingivitis among adult patients.

Materials and Methods

At the start of the study, ethical clearance was obtained from the Institutional Review Board of M.C.E Society, Azam Campus, Pune. The participants were recruited from those who reported to the Outpatient Department of MA Rangoonwala College of Dental Sciences and Research Centre, Pune.

Inclusion criteria

The following criteria were included in this study:
• Healthy patientsabove 18 years of age
• No presence of active dental caries
• Presence of gingivitis
• Patients who had not received any form of therapy for the same complaint for the past 3 months

Table 1: Demographic data of the participants

	Number	Percentage
Age		
18- 30 years	70	33.3
31- 40 years	50	23.9
41- 50 years	70	33.3
51 and above	20	9.5
Religion		
Hindu	123	58.6
Muslims	80	38.1
Christians	7	3.3
Gender		
Male	134	63.8
Female	76	36.2
Level of education		
Graduate	100	47.6
Post graduate	20	9.5
Primary schooling	90	42.9

• Patients who were willing to provide a written informed consent.

Exclusion criteria

The following criteriawere excluded from this study:
• Patients with systemic illnesses
• Patients with active carious lesions
• Presence of only mild gingivitis
• Patients with partial dentures
• Patients below 18 years of age and those not ready to provide a written informed consent for participation in the study.
There were a total of 210 patients recruited for the study andwere randomly divided into threegroups of 70 patients in each:
Group1: Chlorhexidine group (0.12% concentration)
Group2: Triphala mouthwash (Himalaya company) (0.6% concentration)
Group3: Control group with no mouthwash.

Methodology

The plaque score of all the participants in the three groups was recorded (Sillness and Loe1964) [6]. The baseline scores of the gingival index (Loeand Sillness1963) [7]were recorded for all the patients and they were categorizedinto moderate and severe gingivitis. Oral prophylaxis was carried out. Group 1 patients were asked to use chlorhexidine mouthwash(Colgate companyand 0.12% concentration) twice daily. Group 2 patients were asked to use triphalamouthwash (0.6% concentration),and Group 3 patients were kept as controls with no mouthwash. An evaluation of the patients was made at 7 days and 15 days. The plaque and gingival index of the patients were recorded again during the follow-up.The data collected were entered into Microsoft Excel and cleaned. SPSS 20.0 (Chicago, USA) was used for statistical analysis. Chi-square test was carried out for comparison. All P <0.05 was considered to be statistically significant.

Result

Table 1 shows the overall demographic data of the participants. Table 2 shows the distribution of the participants of all the three groups based on the baseline scores of plaque index and gingival index. There were more participants whose plaque score was in the range of poor across all the three groups. Furthermore,higher percentage of

patients had severe gingivitis compared to the moderate amount of gingivitis. After 7 days(Table 3), when the patients were examined again, there was a higher percentage with plaque scores falling in the range of goodand fair compared to the baseline. There were comparatively more patients in Group 3 with a higher amount of plaque accumulation compared to the other two groups. Furthermore, more patients had mild to moderate gingivitis compared to the baseline. The Group 3 patients showed higher percentage in the moderate and severe gingivitis range. After 15 days(Table 4), when the comparison was carried out, there was not much difference observed between the Groups1and2 patients. When the scores were compared for Group 1 for the threeobservations, we observed thatthere was a statistically significant improvement in the number of Group 1 patients after 7 days and 15 dayswith respect to lower plaque accumulation ($\chi2= 9.1429$, P=0.002497). However,no difference was seen between 7 days and 15 days observations.With respect to Group 2, there were more patients who showeda significant decrease in plaque accumulation compared to the baseline after 7 days,and this was statistically significant ($\chi2= 137.5$, P$\leq$ 0.00001). There was no difference between the observations of 7 and 15 days.When the gingivitis was compared for Groups1 and2; after 7 days with baseline, there was a significant improvement,and this difference was found to be statistically significant, respectively. There was no difference between the observations of day 7 and 15 in both the groups.Intergroup comparison was made between the plaque scores for Groups 1and 2. Even though higher percentage of patients showed greater improvement with Group 2 intervention than Group 1, the difference was not found to be statistically significant after 7 days of observation ($\chi2=2.2952$, P= 0.317392). After 15 days, the Group 2 patients showed lesser plaque accumulation compared to Group 1. There were higher patients in Group 1 whose plaque score was in the range of fair compared to the Group 2, yet this difference was not found to be statistically significant. With respect to gingivitis, even though more patients were showed improvement with respect toGroup 2 than Group 1 after 7 days and 15 days of observation, the difference was not found to be significant ($\chi2= 1.3984$, P=0.236984; $\chi2=1.02$, P=0.31251). There

was comparatively higher percentage of people showing improvement in both the interventional groups than the controls with no intervention at 7 days and 15 days of observation. Overall, the intervention with triphalaprovided better results than with chlorhexidine, but this was not statistically significant.

Discussion

The present study focused on the effectiveness of triphalaand chlorhexidine mouthwashes as an adjunct in reducing gingival inflammation and to control plaque in adult patients. It was a parallel single-blinded controlled study. All the literature, till date,havereported the mean effect in reduction of plaque and gingival scores, but we calculated the overall effect on the entire group of participants as a pilot run for a larger community-based trial. Sushruta Samhita states that triphala has hemostatic, anti-inflammatory, analgesic, and wound-healing properties. Haritaki is effective in gingival bleeding, ulcers,anddental caries. Amalaki is rich in Vitamin C that further assists in preventing and controlling gingival bleeding [8]. 0.12%chlorhexidine mouth rinse can provide an important adjunct to the prevention and control of gingivitis but it cannot be safely used for a longer duration of time and may develop complications like allergic reactions. Its effectiveness is due to its substantivity within the oral cavity,andit's both bacteriostatic and bactericidal activity [8]. Triphala has been found to be effective in inhibition of bacterial growth that is a part of dental plaque, very safely when absorbed on to the tooth surface [9]. The presence of free radicals helps to deliver this action. Similar to our findings, another study reported that the percentage change in the gingival index scores of groups with triphalaand chlorhexidine were not significant. However,contrary to our findings, there was a significant plaque reduction reported in the same study. According to an Indian study, triphalawas effective in reducing incipient dental caries as well as microbial growth, plaque,and gingivitis [10]. However,its effectiveness over chlorhexidine was not statistically significant, similar to our study findings. Compared to the commercial ones, triphalais much cheaper and can be easily usedover a long duration [11]. Studies report the significant difference post rinsing with chlorhexidine mouthwash compared to baseline, similar to our study findingswith respect to plaque reduction as well as gingivitis[12, 13]. We also observed that the mouthwash was well received since it was cheap and easily accessible and affordable to the patients. With lesser complications, long-term use of triphalacan be a common community intervention for prevention of plaque accumulation and gingivitis. Long-term studies are essential for establishing the different concentrations and the dose-response relationship of triphalawith respect to the periodontal tissues.

Conclusion

Within the limitations of the study, we can clearly state that:

1. Triphala and chlorhexidine help as an adjunct to toothbrushing for control of

Table 2: Distribution of the participants of all the 3 groups based on the baseline scores of plaque index and gingival index.

	Group1		Group 2		Column2		Total	
Plaque index	N	%	N	%	N	%	N	%
Good	0	0	0	0	0	0	0	0
Fair	34	48.6	32	45.7	34	48.6	100	47.6
Poor	36	51.4	38	54.3	36	51.4	110	52.4
							210	100
Gingival index								
Mild gingivitis	0	0	0	0	0	0	0	0
Moderate gingivitis	27	38.6	23	32.9	23	32.9	73	34.8
Severe gingivitis	43	61.4	47	67.1	47	67.1	137	65.2
							210	100

Table 3: Distribution of the patients based upon the plaque and gingival scores after 7 days of intervention

	Group1		Group 2		Group 3		Total	
Plaque index	N	%	N	%	N	%	N	%
Good	20	28.6	22	31.4	10	14.2	52	24.8
Fair	38	54.3	42	60	35	50	115	54.7
Poor	12	17.1	6	8.6	25	35.7	43	20.5
							210	100
Gingival index								
Mild gingivitis	50	71.4	56	80	42	60	148	70.5
Moderate gingivitis	20	28.6	14	20	25	35.7	59	28.1
Severe gingivitis	0	0	0	0	3	4.3	3	1.4
							210	100

Table 4: : Distribution of the plaque and gingival score based on observations after 15 days post intervention

	Group1		Group 2		Group 3		Total	
Plaque index	N	%	N	%	N	%	N	%
Good	56	80	60	85.8	12	17.1	128	60.9
Fair	14	20	10	14.2	35	50	59	28.1
Poor	0	0	0	0	23	32.9	23	11
							210	100
Gingival index								
Mild gingivitis	59	84.3	63	90	44	62.9	166	79.1
Moderate gingivitis	11	1.6	7	10	23	32.9	41	19.5
Severe gingivitis	0	0	0	0	3	4.3	3	1.4
							210	100

plaque and resultant gingivitis

2. 0.6% of triphalais as effective as 0.12% of

chlorhexidine

3. The mouthwash being cheap and easily

available can be a substitute for chlorhexidine.

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