



ORIGINAL RESEARCH ARTICLE

HERBAL DENTIFRICES: AN ORTHODONTICS ASPECT

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ABSTRACT

Oral diseases continue to be a major health problem world-wide. Oral health is integral to general well-being and relates to the quality-of-life that extends beyond the functions of the craniofacial complex. The standard Western medicine has had only limited success in the prevention of periodontal disease during orthodontic treatment and in the treatment of a variety of oral diseases. Hence, the search for alternative products continues and natural phytochemicals isolated from plants used in traditional medicine are considered to be good alternatives to synthetic chemicals. The botanicals in the Ayurvedic material medica have been proven to be safe and effective, through several hundred to several thousand years of use. The exploration of botanicals used in traditional medicine may lead to the development of novel preventive or therapeutic strategies for oral health. The present scientific evidence based review is focused on the possible role of Ayurveda in the management of various orofacial disorders.

Keywords: Orthodontics, Ayurveda, Herbal toothpaste

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INTRODUCTION

Orthodontic treatments aim to achieve three most essential objectives structural balanced, functional efficiency and esthetics harmony.^[1] While achieving these goal, maintaining the periodontal health of the orthodontic patient is essential. It was well documented in the literature that supragingival plaque control in orthodontic patients become more difficult with fixed nature of orthodontic appliances.^[2] Hence the prevalence of gingival inflammation within the orthodontic patients in increased, also significant increase in incidences of dental caries and their mild variant known as white spot lesions.^[3]

To address the increased plaque accumulation and associated problems, there is a need for increasing the awareness among the orthodontic patients. Increasing education and technique for instruction are the different ways to achieve that goals. Improving homecare products themselves may be another effective way to address this problem.^[4]

Current urban lifestyle awareness to use herbal-based dental health care product and their use in maintaining oral health is on the rise, and it is true even for patients undergoing orthodontic treatment. Such herbal-based dental health care had a history

of more than 1200 years and they are originated from "Ayurveda".^[5]

Ayurveda is the traditional method of alternate medicine which is popular in the Indian subcontinent. In Ayurveda, various herbal combinations for maintaining the oral hygiene had been briefly described. Based on knowledge, that available from Ayurveda various dentifrices formulations are available in the market. Most of them claiming advantages of formulation in maintaining oral hygiene.^[5]

In current scenario hundreds of dentifrices are available, and it is become essential to verify the efficiency of these dentifrices by clinically in a patient undergoing fixed orthodontic treatment. The present study was conducted to verify the effectiveness of various herbal-based dentifrices in orthodontic patients.

MATERIAL AND METHODS

Study Design:

A cross-sectional study was designed to evaluate the influence of Ayurveda dentifrices on plaque growth in orthodontic patients over the period of 4 week. A group of eighty participants aged between 14-25 years were selected. All of them undergoing routine orthodontic bonding procedure for treatment of various types of malocclusion. Before the study was started all participants received a thorough oral prophylaxis. Afterward,

standard bonding procedure were followed with no excess composite flashed around brackets. Gingival index and Plaque index was



Fig 1. Disclosing Agent

Inclusion criteria: To be included in the study, participants should have

1. Baseline plaque score < 1-1.9.
2. Good general health.
3. All of them were a regular attendee of toothbrush and dentifrices.

Exclusion criteria: The exclusion criteria include

1. Smaller clinical crown height of tooth,
2. Participants undergone any recent systemic antibiotic therapy,
3. History of aggressive periodontitis/early onset periodontitis, acute necrotizing ulcerative gingivitis (ANUG), a gross oral pathology that affects daily oral hygiene protocol.

A total of 80 patients were present at the time of initial but based on inclusion and

noted with the help of Disclosing Agent (Plak-Check, Vishal Dental Product) (Figure. 1).

exclusion criteria only 67 participants were eligible to participate in the study.

Control group dentifrices (Non-herbal dentifrice [n = 16]) and experimental group tooth (herbal dentifrice [n = 64]), total no of 80 Dentifrice were purchased. Control group dentifrices was a Colgate Strong Teeth dentifrices, and experimental group include a Dabur Babool, Dabur Meswak, Dabur Red and Vicco Vajradanti (Figure 2).

Then eighty black plastic pouches were used, in each pouch out of eighty dentifrices a randomly selected dentifrice was placed. All pouches with dentifrices were collectively placed in the single container to avoid operator bias. A blindly selected pouch is provided to participants on their bonding visit, participant where instructed to bring used dentifrices pouch after four weeks. All patients were instructed to perform brushing twice a daily, at least 5 minutes by using horizontal scrub brushing technique and dentifrices provided to them. For brushing, the same toothbrush which having soft, multi-tufted toothbrush was prescribed. During study period use of dental floss or tooth picks for interdental cleaning prohibited.

After four weeks, dentifrices name was noted, and participants were assigned to the

respected group according to dentifrices they used for four weeks. Distribution of participants shown in Table no. 1. At the end

of study Plaque and Gingival index was calculated.



Fig 2. Dentifrices Used for Study

Table 1. Distribution Group according to toothpaste

Groups	Non- Herbal Tooth Paste	Herbal Tooth Paste			
		Dabur Babool	Dabur Meswak	Dabur Red	Vicco Vajradanti
Brand Name	Colgate Strong teeth	Babool	Meswak	Red	Vajradanti
N	12	13	15	14	13
Total	12	55			

n= number of subjects participated

Statistical analysis: The data obtained from the study were compiled, tabulated, and subjected to statistical analysis. Data obtained were analyzed using Statistical Package for the Social Sciences version 21 manufactured by IBM Corporation -Armonk, New York, US. Student paired t-test, and unpaired t-test was applied to assess between-group differences.

A $P \leq 0.05$ had been considered as statistically significant.

RESULTS

All 67 enrolled subjects in this study completed the study for the entire duration of four week. After complication of study, it was observed that there was no significant difference seen in scores between all groups ($P < 0.05$). The result described in Table 2.

Proximal surfaces scored highest as compared to the buccal and lingual surface.

Table 2. Plaque and Gingival Index in different groups

Surfaces		Dabur Babool		Dadur Meshwak		Dabur Red		Vicco Vajrandanti		Colgate Strong teeth	
		PI	GI	PI	GI	PI	GI	PI	GI	PI	GI
Anterior	Buccal	0.63±0.45	38±29	0.85±0.06	30±22	0.6±0.47	33±24	0.65±0.68	37±23	1.11±0.52	32±18
	Proximal	0.99±0.57	58±26	1.41±0.07	67±36	1.11±0.49	61±22	1.61±0.19	58±27	1.3±0.45	64±26
	Lingual	0.93±0.57	51±26	0.78±0.44	47±35	0.76±0.35	50±39	0.68±0.23	57±33	0.45±0.34	60±36
Posterior	Buccal	0.77±0.43	32±24	0.71±0.55	37±24	0.37±0.47	21±27	0.78±0.51	49±32	0.84±0.66	38±25
	Proximal	1.11±0.55	56±33	1.01±0.69	55±23	1.12±0.51	63±24	1.1±0.68	71±16	1.31±0.61	69±28
	Lingual	0.81±0.47	61±31	0.94±0.25	71±22	0.81±0.53	71±32	0.78±0.36	68±26	0.85±0.47	51±21
Total		0.87±0.51	49±28	0.95±0.54	51±29	0.80±0.47	50±28	0.93±0.44	57±26	0.98±0.51	52±26

PI= Plaque index, GI=Gingival Index

DISCUSSION

Plaque accumulation and gingivitis are common problems in orthodontic patients and a major concern for an orthodontist. Various herbal medicine is mentioned in Ayurvedic literature, which can be used for the treatment of gingivitis. The present study evaluated the plaque- inhibiting effects of herbal and non-herbal dentifrices in orthodontic patient’s Intergroup comparison using cross over design were chosen. By using

this design variation in tooth brushing and plaque formation among participant was eliminated [6].

Bjorn Ogaard et.al [7] conducted a study to evaluate the plaque-inhibiting effect of a dentifrice containing stannous fluoride pyrophosphate on patients undergoing orthodontic treatment with fixed appliances. They concluded that no statistically significant improvement in the gingival condition and no side effects was observed. Similar to the Bjorn

Ogaard et. al's study, a double-blind cross over design was applied on. Result from this shows correlations in result with our study.

A similar study was conducted by B.Amoian et.al^[8] on Calendula extract toothpaste to evaluated effects on the plaque index and bleeding in gingivitis. 40 subject was participated in the study. All of them were instructed to brush their teeth thrice a days by using Bass technique for brushing tooth Calendula extract toothpaste. At the end of study plaque and gingival index was calculated. They were observed the significant decreased in plaque and gingival index.

In this study Bass method of brushing was not used because it is not indicated in orthodontic patients. Which might the reason for deviation in result when we compared this study. Similarly frequency of brushing also variable as compared to our study.

The orthodontic appliance will make difficult to compare plaque index score for different area or surfaces. Hence, a more simple and objective form was used in this study. All patient which having smaller clinical crown height was eliminated to avoid the bias of orthodontic appliance placement when appliance closer to the gingiva. Same method was used by Bgaard et.al^[7]

This study compared herbal dentifrices with Non-Verbal dentifrices. All of the dentifrices were found to be useful in

effectively controlling plaque accumulation. Also, the plaque and gingival index after a period of 4 week show no significant difference. The difference in scores of all the dentifrices was found to be statistically less significant at 5% level of significance.

By comparing the mean between the groups, it can be concluded that the difference in mean of the group was slightly less than that in Colgate Strong Teeth (0.98 ± 0.51), but the difference between the Herbal dentifrices group was not statistically significant ($P > 0.05$), and thus superiority cannot be claimed. Herbal dentifrices shows plaque index 0.87 ± 0.51 , 0.95 ± 0.54 , 0.80 ± 0.047 , 0.93 ± 0.44 for Dabur Babool, Dabur Meswak, Dabur Red and Vicco Vajradanti Respectively. However, it can be said that Dabur Meswak was as effective as that of the control group in controlling score of plaque index and gingival index.

The previous study has shown that Ayurvedic Dentifrices are effective in controlling plaque inhibition in the same manner does other dentifrice did. A similar pattern was observed during this study.

The strength of the study was its cross-sectional design with the double-blinded designed study. The drawback of the study is that it a relatively small sample size of each group, and thus it showed a statistically less significant difference between the groups. The

second drawback was the open-labeled design nature of the study. Despite these disadvantages, this study demonstrated the role of Ayurvedic herbs in the management of Orthodontic patients. Further research can be carried out in larger sample size to evaluate further these results.

Also, there is scope for further studies to determine the duration of the plaque-inhibiting effect of these herbal dentifrices and also the frequency of brushing. Synergic effects of herbal formulations, it may not be possible to interpret the action of each ingredient. Which will helpfull to determine the therapeutic effect of each ingredient of herbal dentrifices. Answers to such questions could lead to evidence-based plaque and caries control regimens by the use of Ayurvedic herbs in orthodontic patients.

CONCLUSION

From this observation, it can be concluded that Herbal and non-herbal dentifrice are effective in controlling plaque and gingival index score during orthodontic treatment. Both the groups showed a similar effect in treating gingivitis. A polyherbal combination of herbs mentioned in Ayurveda for oral hygiene has a potential for management of gingivitis during orthodontic treatment.

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