International Journal Dental and Medical Sciences Research
Volume 3, Issue 4, July-Aug 2021 pp 40-44 www.ijdmsrjournal.com ISSN: 2582-6018

Effectiveness of A Herbal Toothpaste In Comparison With A Non-Herbal Tooth Paste in Patients with Gingivitis- A Randamized Control Trial

[1]B. Ruparani, [2]Sheema Shahed, [3]Ashritha ravali, [4]M. Ramakanth
[1]*Professor, Department of periodontics and implantology,MNR dental college and hospital*
[2,3,4]*PostgraduateStudent Department of periodontics and implantology, MNR dental college and hospital,sangareddy*
Corresponding Author: Sheema Shahed

Submitted: 01-07-2021 Revised: 10-07-2021 Accepted: 13-07-2021

ABSTRACT:Gingivitis is defined as inflammation of the gingiva. Prevalence of gingivitis is apparent globally. It effects nearly 85% of the world population. Being one of the most common oral infections it needs to be treated in its initial stages, if ignored it might lead to periodontal destruction. Personal care by various mechanical procedures are effective methods for controlling gingivitis. It condenses with good oral hygiene such as longer and more frequent brushing, flossing or by using antiseptic mouth rinses. In recent times, there has been increased research done on plant-based products. Hiora is one such herbal tooth dentifrice for the treatment of gingivitis. Hence, this study was aimed to evaluate the effectiveness of an herbal toothpaste (HIORA) in comparison with a non- herbal toothpaste (COLGATE) in patients with gingivitis. MATERIALS AND METHODS: A total of 50 patients were examined for plaque Index, Bleeding index and gingival index and assigned a plaque, bleeding and gingival score. They were randomly assigned to use either herbal Hiora toothpaste (test group) or Colgate toothpaste (control group). The patients were instructed to use for 3 months. Evaluation done at baseline and at 3 months. RESULTS: Analysis of plaque scores, bleeding scores showed a reduction in plaque index, bleeding index and gingival index after using herbal toothpaste when compared to non-herbal toothpaste**.**
CONCLUSION: Brushing with Herbal toothpaste gave significant results when compared to non-herbal toothpaste**.**
KEYWORDS: Anti-microbial, Bleeding gums, Gingivitis, Herbal and non-herbal dentifrices, Periodontitis.

I. INTRODUCTION

Periodontal disease ranges from gingival inflammation (gingivitis) to loss of tooth-supporting tissues (periodontitis). Gingivitis is a non-destructive condition that causes inflammation and bleeding of gingiva (gums). It is the second major dental disease after dental caries. The evolution of gingivitis is believed to be due to plaque or biofilm and attributed to various other sources- locally and systemically. Dental Plaque, a diverse community of microorganism found on tooth as a biofilm deposit is a major factor of concern and its presence on teeth can be unesthetic pathogenic in nature which is considered a culprit for dental caries, gingivitis, periodontal problem, and halitosis [1]. Chronic gingivitis tends to progress to periodontitis but not all gingivitis progress to periodontitis, its progress can be attributed to social conducts and oral hygiene habits and systemic well-being. With good oral hygiene it is reversible but if not controlled it causes destruction of supporting tooth structures. Several mechanical aids have been practiced worldwide to remove and control plaque gingivitis including tooth brushes, dental floss, mouth rinses dentifrices [2]. Mechanical plaque removal is one of the most accepted methods of controlling plaque and gingivitis [3]. Various chemical agents have been used along to supplement mechanical aids. Several chemical preventive agents have proven beneficial effects in the control of plaque and to reduce or prevent oral disease. Hence, various chemical formulations were tried in dentifrices [4]. Antimicrobials, mainly triclosan and chlorhexidine have been added in dentifrices and mouth washes but some of these substances show undesirable side effects such as tooth staining and altered taste [1], hypersensitivity reactions and in worst cases systemic effects.

In recent times, there has been an upsurge in demand for organic products, people showed greater interest due to its non-invasive, environmentally friendly and less chemical

International Journal Dental and Medical Sciences Research
Volume 3, Issue 4, July-Aug 2021 pp 40-44 www.ijdmsrjournal.com ISSN: 2582-6018

exposure. Dentistry advanced to incorporate these features into its products, among such products are herbal toothpastes which are either single or multicomponent preparations for better oral health. It aids in healing and are effective in controlling microbial plaque in gingivitis and periodontitis thereby improving immunity. Some of the major constituents of Himalaya herbal paste- Hiora (toothpaste for inflamed and spongy gums) used in this study include Babbula, Amla- anti-germ effect and stimulates immune response, Lavanga-helps in strengthening gums, Nimba- aids in gingival care, Triphala- exhibits astringent action and keeps the

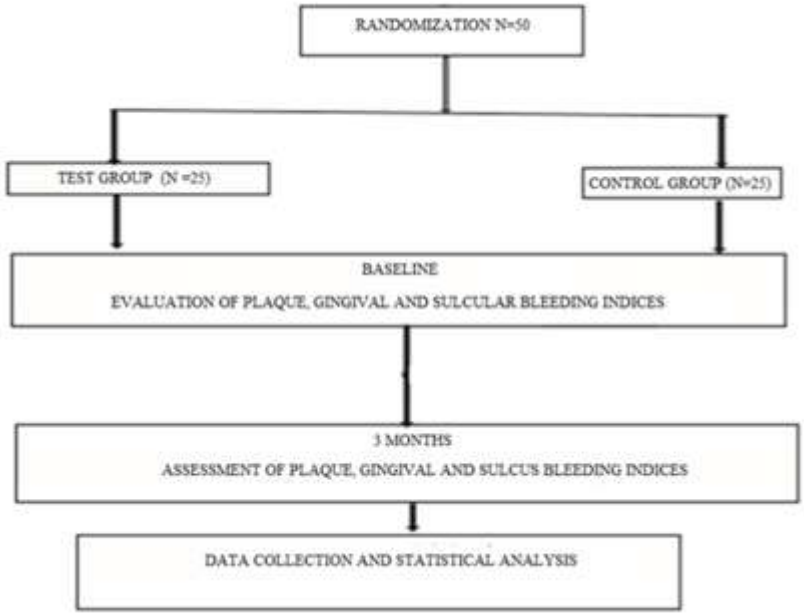

Table1: schematic diagram of study design.

gingiva tight and prevents influx of pathogens and has anti-haemorrhagic properties, Tulasi- freshness and anti-inflammatory effect. They together act on periodontal pathogens by production of proteolytic enzymes (Bromelain and Papain) help reduce plaque formation.

II. METHODOLOGY:

This was a single blinded, randomized control trial. Subjects for the study were recruited from patients reporting to department of periodontics MNR dental college and hospital, saggared. The study was conducted over a period of 3 months; informed consent was taken prior to the participation in the study and ethical clearance from the college was obtained.

A sample size of 50 (25 for each group) were assigned, patients who satisfied the inclusion criteria were made a part of the study. The inclusion criteria established was systemically healthy individuals with gingivitis, Age ≥ 18 years, minimum of 14 teeth present and those who agreed to comply with the study visits were included in the study.

Exclusion criteria included presence of established destructive periodontal disease (Russel's index score≥ 2) use of antibiotics in the previous 3 months, smokers, use of any mouth rinses in the previous 3 months or underwent oral prophylaxis previously in the past 3 months, allergic to any of the herbal ingredients if any.

The subjects were randomly assigned to the control group (Colgate) and the test group (Hiora-herbal paste) the randomization was done via the coin toss method. Subjects were not aware of the dentifrice given to them. The paste was dispensed in a separate tube marked group A and group B of which they had no knowledge and were also not aware of the contents of the dentifrice to ensure proper blinding. Subjects belonging to group A received 90ml of Colgate (Palmolive India Ltd.) and subjects of group B received 90 ml of Hiora (Himalaya. Drug. co). The investigators did not perform any oral prophylaxis prior to the commencement of the study and no attempt was made to amend the oral hygiene practices of the subjects under study. A brief case history was documented and baseline parameters were recorded for Oral Hygiene Index (Greene and vermillion)

International Journal Dental and Medical Sciences Research
Volume 3, Issue 4, July-Aug 2021 pp 40-44 www.ijdmsrjournal.com ISSN: 2582-6018

[5], Plaque Index (silness and Loe.H) [6] Gingival Index (Loe.H. and Silness) [7] and Sulcus Bleeding Index (Muhleman.H. R & son. S) [8].

The subjects were instructed to use roughly around 12 mm of toothpaste to standardize the quantity of paste used every time they brushed, the subjects were advised to brush twice a day (morning and night) for approximately 2 mins for 3 months. The parameters where again recorded at 3 months. There were no drop outs in the study.

III. STATISTICAL ANALYSIS:

Intergroup and Intragroup comparisons were done using paired t-test. All statistical tests employed a level of significance of $p \leq 0.05$. The statistical data was charted and graphed by Microsoft Word version 2016.

GROUP	N	MEAN	Std Deviation	Change%	P value
OHIS					
CONTROL					
Baseline	25	2.65	0.67	23.77%	0.0006
3months	25	2.02	0.54		HS*
TEST					
Baseline	25	3.11	1.04	50.48%	0.0001
3 months	25	1.54	0.62		HS*
PLAQUE INDEX					
CONTROL					
Baseline	25	2.31	0.68	19.48%	0.02
3months	25	1.86	0.51		S*
TEST					
Baseline	25	2.31	0.72	45.88%	0.0001
3 months	25	1.25	0.28		HS*
GINGIVAL INDEX					
CONTROL					
Baseline	25	2.49	0.49	5%	1
3months	25	2.36	0.37		NS*
TEST					
Baseline	25	2.31	0.72	48.05%	0.0001
3 months	25	1.20	0.28		HS*
SULCULAR BLEEDING INDEX:					
CONTROL	25	2.53	0.56	15.01%	0.002
Baseline	25	2.15	0.43		S*
3months					
TEST	25	2.86	0.29	47.55%	0.0001
Baseline	25	1.5	0.36		HS*
3 months					

*p ≤ 0.005- statistically significant *NS- not significant *HS- highly significant

Table2: Intragroup comparisons of OHIS PI, GI, SBI at baseline and 3 months in test and controls

IV. RESULTS:

A total of 50 participants were enrolled in the study and data was recorded from all the patients at baseline and at 3 months. There were 34 females and 16 males included in the study.

Oral hygiene index scores: At baseline there was no statistical difference that was recorded between the 2 groups. On intragroup comparison, there was highly significant reduction in oral hygiene scores of test and control groups at 3 months. The control group shows 23.77% reduction in OHI scores whereas test group shows a marginal reduction of 50.48% on use of Hiora paste for 3 months. Between group comparison showed significant difference (p=0.0006). The controls showed a significantly higher reduction. However, both pastes showed improvements in oral hygiene scores.

Plaque index: At baseline plaque index showed similarity between the 2 groups. On intragroup comparisons, a reduction of 19.48% for control group whereas 45.88% reduction seen in test group at 3 months indicating extreme

International Journal Dental and Medical Sciences Research
Volume 3, Issue 4, July-Aug 2021 pp 40-44 www.ijdmsrjournal.com ISSN: 2582-6018

significance value of (p=0.0001). The controls showed a significantly higher reduction.

Gingival index: the scores recorded for both the groups at baseline differed less. Control group showed negligible changes and score for significance was non-significant(p=1) but test group showed a reduction of 48.05% on regular use of the herbal paste for 3 months with high significance of (p=0.0001)

GROUP	MEAN± S. D	CHANGE%	P value
OHIS Control Test	 0.63 ± 0.698 1.57 ± 1.180	 23.77% 50.48%	 0.94 Not significant
PLAQUE INDEX Control Test	 0.45 ± 0.652 1.06 ± 0.770	 19.48% 45.88%	 0.133 Significant
GINGIVAL INDEX control Test	 0.13 ± 0.468 1.11 ± 0.770	 5% 48.05%	 0.0002 Highly significant
SULCULAR BLEEDING INDEX Control Test	 0.38 ± 0.570 1.36 ± 0.765	 15.01% 47.55%	 0.40 Not significant

Table:3 intergroup comparisons of OHI, PI, GI, SBI. At baseline and at 3 months in test and control

Sulcular bleeding index: with little statistical difference between the 2 groups at baseline group A showed a reduction of 15.01% and group B showing 47.55% reduction with highly significant result (p=0.0001).

Inter group comparisons analysed that both group A and B improved oral hygiene status, a significant difference in scores of plaque and gingival indices indicates an improvement in gingivitis inducing parameters.

None of the volunteers for the study reported any adverse reaction or discomfort during the trials and reported usage of paste even after the completion of study with satisfaction.

V. DISCUSSIONS

In recent times, there has been a renewed interest in using herbal based products. In theindigenous systems of medicine, different components of different plants have been used in medicinal preparations to clean teeth or to treat oral diseases including periodontal disease [9-13]. Herbal-based toothpastes are as effective as the conventionally formulated dentifrice in the control of plaque and gingivitis [12]. it is important that clinical trials verify the efficacy of any new product, instead of simply assuming that the product is efficient based on laboratory studies [13]. The active ingredients of Colgate and many other commercial non-herbal toothpastes include triclosan and PVM/MA copolymer as an antimicrobial. At bacteriostatic concentrations these antimicrobials prevents essential amino acid uptake, while at bactericidal concentrations, triclosan destroys the integrity of cytoplasmic membrane and causes leakage of its essential cellular components however in case of herbal paste as in Hiora the natural ingredients present produce proteolytic enzymes (Bromelain and Papain) that reduce plaque formation by disruption of periodontal pathogens, they are also known to have anti-inflammatory effects and can be used for wound healing.

In our study the comparison of a herbal toothpaste -Hiora to a non-herbal toothpaste - Colgate was assessed in gingivitis via specific indices that included OHIS gingival index, plaque index, sulcular bleeding and herbal dentifrice proved to have a significant intragroup reduction as well as inter group reduction in the parameters measured which can be attributed to known advantage of herbal products over defence mechanism and antimicrobial properties compared to its non-herbal counter parts. The present study has proved that herbal dentifrices do not cause any adverse effects on the oral cavity and are effective

in reduction of plaque and gingivitis, as that of fluoridated non-herbal dentifrice. [4,13] Several studies have proven the medicinal values of herbal products. Hence, medicated herbal toothpastes can be safely used to control plaque and gingivitis. This is in agreement with the report by Ozaki et al.5(28.4% and 36.3% reduction respectively). However, in contrast to our study carried out by de Oliveira et al [14] found slightly lower efficacy of herbal product on gingivitis and gingival bleeding compared to the conventional one.

[1] Kuldeep Singh et al carried out a similar study that assessed the efficacy of (dantkari) an herbal paste in comparison to non-herbal and found it more efficient in maintenance of oral hygiene and gum bleeding and reduces debris and calculus effectively.

[11] Aravind et alin their study over the effects of herbal paste (Dabur Red) over non herbal paste in controlling plaque and gingivitis found a statistically significant difference between both the groups for plaque and gingival score and concluded that herbal dentifrice was as effective as non-herbal dentifrices in the control of plaque and gingivitis. Hence, natural products with added benefits can be effectively advised for regular use. Further long-term studies are required to prove their effectiveness.

VI. CONCLUSION:

After a 3-month trial, both test and control groups showed improvement in oral hygiene status as well as bleeding status of gingiva but herbal pastes showed greater and effective reduction of plaque and gingivitis, which was statistically significant. No adverse reactions to dentifrices products were observed during the trial. It can be concluded that clinically, herbal dentifrices are more effective dentifrices in the control of plaque and gingivitis.

REFERENCES:

[1]. Cowan MM. Plant products as antimicrobial agents. Clin Microbiol Rev. 1999; 12:564-582.
[2]. Nanayakkara V, Ekanayake SL. Use of traditional medicine for oral conditions in rural srilanka. Int Dent J. 2008; 58:86-90.
[3]. Pilapitiya U. Traditional medicine. Reg Health Forum. 1996; 1:51.
[4]. George J, Hegde S, Rajesh KS, Kumar A. The efficacy of a herbal-based toothpaste in the control of plaque and gingivitis: a clinic-biochemical study. Indian J Dent Res. 2009; 20:480-482.
[5]. Greene JC, Vermillion Jr. The simplified oral hygiene index. J Am Dent Assoc. 1964 Jan;68:7-13.
[6]. . Silness J, Loe H.. Periodontal Disease in Pregnancy II. Correlation Between Oral Hygiene and Periodontal Condition. Acta Odontol Scand. 1964;February;22:21-35.
[7]. Loe H, Silness J.. Periodontal disease in pregnancy. I. Prevalence and severity. Acta Odontologica Scandinavica. 1963;21:533–51.
[8]. Mhlemann,H.R.&Son,s.Gingival bleeding a leading symptom in initial gingivits. Helvetica odonto-logicaacta,15:107-113(1971)
[9]. Ozaki F, Pannuti CM, Imbronito AV, et al. Efficacy of a herbal toothpaste on patients with established gingivitis e a randomized controlled trial. Braz Oral Res. 2006; 20:172-177
[10]. Kuldeep Singh et al, Comparative studies between herbal toothpaste (dantkanti) and non-herbal tooth paste. International Journal of Dental Research.2016;53-56.
[11]. Tatikonda A, Debnath S, Chauhan VS, Chaurasia VR, Taranath M, Sharma AM. Effects of herbal and non-herbal toothpastes on plaque and gingivitis: A clinical comparative study. J Int Soc Prev Community Dent. 2014;4(Suppl 2): S126-S129.
[12]. George J, Hegde S, Rajesh KS, Kumar A. The efficacy of a herbal-based toothpaste in the control of plaque and gingivitis: A clinic-biochemical study. Indian J Dent Res. 2009; 20:480–2.
[13]. Mazumdar M, Chatterjee A, Majumdar S, Mahendra C, Patki PS. Evaluation of the safety and efficacy of complete care herbal toothpaste in controlling dental plaque, gingival bleeding and periodontal diseases. J Homeop Ayurv Med. 2013; 2:1–5.
[14]. De Oliveira SM, Torres TC, Pereira SL, Mota OM, Carlos MX. Effect of dentifrice containing Aloe vera on plaque and gingivitis control. A double-blind clinical study in humans. J Appl Oral Sci. 2008; 16:293–6.