

International Journal of Research in Health and Allied Sciences

Journal home page: www.ijrhas.com

Official Publication of "Society for Scientific Research and Studies" [Regd.]

ISSN: 2455-7803

Index Copernicus value [ICV] = 68.10;

ORIGINAL RESEARCH

A comparative study to analyse effects of herbal and non-herbal toothpastes on plaque and gingivitis

Insha Shehri¹, Sheeba Nissar², Karuna³

¹M.D.S Private consultant, Department of Periodontics & Implantology, Jammu and Kashmir,

²M.D.S Private consultant, Department of Periodontics & Implantology, Delhi),

³M.D.S Department of Periodontics & Implantology, Shree bankey Bihari Dental college, Ghaziabad,

ABSTRACT:

Background: Plaque induced gingivitis is the second most common oral disease after dental caries. In an effort to enhance the efficacy of mechanical tooth-cleaning procedures, antimicrobial agents have been added to dentifrices. Various chemical agents have been used in toothpastes and mouth rinses and a few have been shown to reduce dental plaque formation.⁵ Due to an increased awareness of indigenous medical practices in various parts of the world, the use of "herbal" medicine has engendered interest and facilitated the growth of complementary and alternative therapies in health care promotion. **Aim of the study:** To analyse effects of herbal and non-herbal toothpastes on plaque and gingivitis. **Materials and methods:** The study was conducted in the Department of Periodontics of the dental institution. For the study, a total of 50 patients were selected in the age range of 25-50 years. The participants were randomly grouped into two groups, Group 1 and Group 2. Each patient in both the groups were given a unlabeled toothpaste tube. Only an independent investigator was aware about the participants of the group and contents of the pastes. Group 1 used commercial herbal dentifrice Dabur Red containing the following: Pudina satva, Tomar beej and laung ka tel. The Group 2 used Pepsodent containing- calcium carbonate, water, sorbitol, sodium lauryl sulfate, hydrated silica, flavor, magnesium aluminum silicate, sodium monofluorophosphate, potassium nitrate, benzyl alcohol, sodium silicate, cellulose gum, triclosan, and sodium saccharin. **Results:** We observed that both the groups had significant improvement in mean plaque index over 30 days. The result in improvement of plaque index in both the groups is comparative and is statistically significant. We observed that significant improvement in mean GI of the patients was observed in both the groups. The results were statistically significant. **Conclusion:** Within the limitations of the present study, it can be concluded that herbal and non-herbal toothpastes are effective in minimizing gingivitis and plaque removal. Any toothpaste can be used with a toothbrush using proper toothbrush movements to achieve good oral hygiene.

Keywords: Herbal dentifrices, herbal toothpaste, plaque, index

Received: 29 May, 2020

Revised: 6 June, 2020

Accepted: 7 June, 2020

Corresponding author: Dr. Insha Shehri M.D.S Private consultant, Department of Periodontics & Implantology, Jammu and Kashmir, India

This article may be cited as: Shehri I, Nissar S, Karuna. A comparative study to analyse effects of herbal and non-herbal toothpastes on plaque and gingivitis. Int J Res Health Allied Sci 2020; 6(3):98-101.

Introduction:

Plaque induced gingivitis is the second most common oral disease after dental caries. It is thought to affect at least 75% of the population worldwide.¹ Gingivitis begins in the child hood and its prevalence increases with age. It has been reported that plaque induced gingivitis is seen in dentate individuals of all age group. Self-performed mechanical plaque removal is a proven

method of controlling plaque and gingival disease.² However, tooth brushing and flossing are difficult tasks and depend on individual dexterity. Thus, many patients might not be able to completely remove plaque on all teeth surfaces. Mechanical plaque control is a time-consuming procedure, and some individuals may lack motivation for maintaining good oral hygiene. In an effort to enhance the efficacy of mechanical tooth-

cleaning procedures, antimicrobial agents have been added to dentifrices.^{3, 4} Various chemical agents have been used in toothpastes and mouth rinses and a few have been shown to reduce dental plaque formation.⁵ Due to an increased awareness of indigenous medical practices in various parts of the world, the use of “herbal” medicine has engendered interest and facilitated the growth of complementary and alternative therapies in health care promotion. Herbal ingredients have been present in oral care products, more commonly in South Asian countries, for some time.⁶ Hence, the present study was conducted to analyse effects of herbal and non-herbal toothpastes on plaque and gingivitis.

Materials and methods:

The study was conducted in the Department of Periodontics of the dental institution. Ethical clearance for the study was approved from the ethical clearance committee of the institute before starting the study. For the study, a total of 50 patients were selected in the age range of 25-50 years. Completely edentulous and partially edentulous patients (teeth less than 20) and patients with severe periodontitis were excluded from the study. An informed written consent was obtained from each participant after explaining them the complete protocol of the study. The participants were randomly grouped into two groups, Group 1 and Group 2. Each patient in both the groups were given a unlabeled toothpaste tube. Only an independent investigator was aware about the participants of the group and contents of the pastes. Group 1 used commercial herbal dentifrice Dabur Red containing the following: Pudina satva, Tomar beej and laung ka tel. The Group 2 used Pepsodent containing- calcium carbonate, water, sorbitol, sodium lauryl sulfate, hydrated silica, flavor, magnesium aluminum silicate, sodium monofluorophosphate, potassium nitrate, benzyl alcohol, sodium silicate, cellulose gum, triclosan, and sodium saccharin. All participants were instructed to brush their teeth for 3 min 2 times a day for 30 days

with Bass method using the given toothpaste and brush. Verbal and written instructions were given to all subjects about the use of dentifrices. The plaque index (PI) and gingival bleeding index (GI) of all teeth were recorded by a single trained examiner on days 0 and 30. For PI, the values of two sites were averaged for each participant. The amount of plaque was scored using two-tone disclosing solution and Turesky's (1970) modification of the Quigley, Hein (1962) index (PI), and Gingival index scoring (GI) by Silness and Loe (1963). Oral cavity was examined for any adverse reaction on hard and soft tissues by the same examiner. Dentifrices tubes were collected from all subjects after completion of the study and weighed before and after trial to find the quantity used.

The statistical analysis of the data was done using SPSS version 11.0 for windows. Chi-square and Student’s t-test were used for checking the significance of the data. A p-value of 0.05 and lesser was defined to be statistical significant.

Results:

Table 1 shows comparison of PI between group 1 and 2. We observed that both the groups had significant improvement in mean plaque index over 30 days. The result in improvement of plaque index in both the groups is comparative and is statistically significant (p<0.05). [Fig 1] Table 2 shows the comparison of GI between group 1 and 2. We observed that significant improvement in mean GI of the patients was observed in both the groups. The results were statistically significant.

Table 1: Comparison of PI between group 1 and 2

| Groups | Mean Plaque Index (Mean ± SD) | | p-value |
|----------------|-------------------------------|-----------|---------|
| | Day 0 | Day 30 | |
| Group 1 (n=25) | 2.65±0.29 | 1.78±0.39 | 0.02 |
| Group 2 (n=25) | 2.59±0.63 | 1.83±0.32 | 0.01 |

Fig 1:

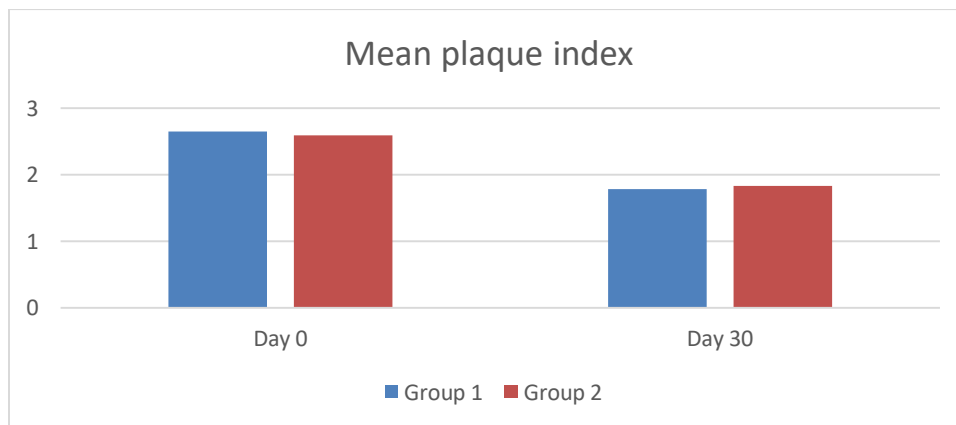
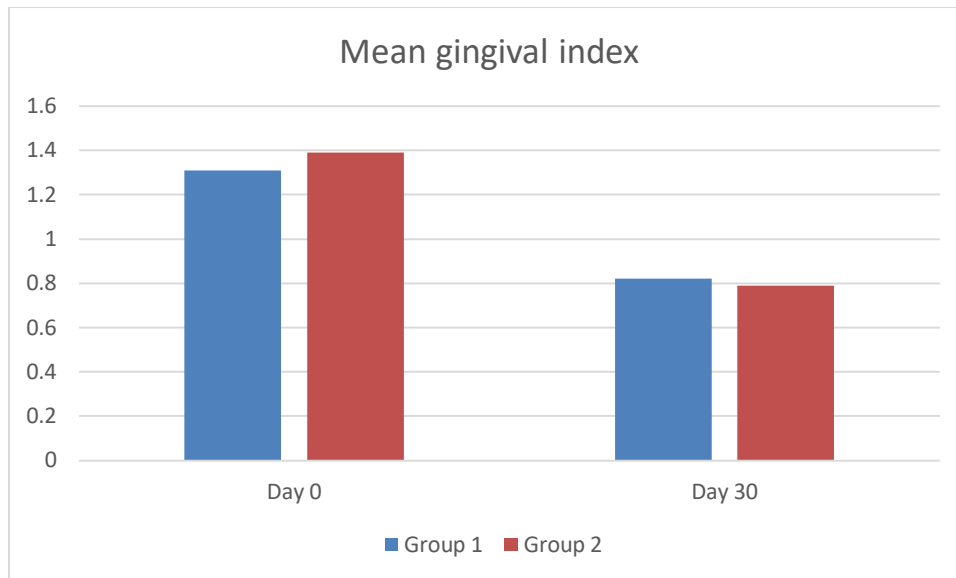


Table 2: Comparison of GI between group 1 and 2

| Groups | Mean Gingival Index (Mean + SD) | | p-value |
|----------------|---------------------------------|-----------|---------|
| | Day 0 | Day 30 | |
| Group 1 (n=25) | 1.31±0.12 | 0.82±0.11 | 0.02 |
| Group 2 (n=25) | 1.39±0.30 | 0.79±0.16 | 0.05 |

Fig 2:



Discussion:

In the present study, we observed that herbal and non-herbal toothpastes are significantly effective in improving the gingival health and reducing plaque on the teeth. On comparing both the toothpastes, this can be inferred that both toothpastes are effective similarly. The most important modality in gingival health is by efficiently using toothbrush movements for proper removal of plaque from the tooth surface. The results were compared with previous studies. Tatikonda A et al investigated the effectiveness of herbal toothpaste (Dabur Red) in controlling plaque and gingivitis, as compared to conventional (non-herbal) dentifrice (Pepsodent). In this study, 30 subjects aged 35–43 years with established gingivitis and at least 20 natural teeth, and having a probing depth <3 mm were investigated. After the washout period, plaque and gingival index (PI and GI, respectively) scores were assessed at days 0 and 30. Differences between groups were compared with Mann–Whitney U test and the mean scores of PI and GI by Wilcoxon test. At the end of 30 days of the study, there was statistically significant difference between both the groups for plaque and gingival scores. After 30 days of trial, both test and control groups showed effective reduction of plaque and gingivitis, which was statistically significant. No adverse reactions to dentifrices products were observed during the trial. It was concluded that herbal dentifrice was as effective as non-herbal dentifrices in the control of plaque and

gingivitis. Al-Kholani AI et al evaluated and compared the effectiveness of antimicrobial dentifrices with herbal extracts and conventional toothpaste with no antimicrobial action for improvement of oral hygiene and reduction of gingival inflammation. 48 volunteers with chronic marginal gingivitis were randomly divided into three groups. Groups 1 and 2 received herbal extract dentifrices. Group 3 used a conventional dentifrice. Subjects were asked to use the allocated dentifrice, three times a day, for 42 days. Values of Patient Hygiene Performance, Approximal Plaque, Gingival, and Sulcular Bleeding indices were assessed at baseline, after 14, 28 and 42 days. Oral hygiene (tooth brushing with dentifrices for 42 days) led to a significant decrease in plaque accumulation on smooth and approximal tooth surfaces, reduction of gingival inflammation and gingival sulcus bleeding. Final indices values in both herbal test groups were significantly lower compared to those at baseline and those after 42 days in the conventional group. They concluded that continuous application of herbal tooth paste provided significant improvement of oral hygiene level in patients with gingivitis.^{7, 8} Mehta V et al studied effects of herbal dentifrice compared to conventional dentifrice on plaque and gingival inflammation. MEDLINE, Cochrane Central Register of Controlled Trials, and major journals were explored for studies up to September 30, 2017. A comprehensive search was designed and the articles

were independently screened for eligibility by two reviewers. Randomized controlled clinical trials, in which oral prophylaxis was undertaken before the intervention was introduced into the oral cavity using toothbrush were included. Where appropriate, a meta-analysis (MA) was performed and standardized mean differences (SMDs) were calculated. Ten articles out of 1378 titles were found to meet the eligibility criteria. A MA showed that for plaque intervention the SMD was 2.14; 95% confidence interval (CI): 0.88–3.41, $P = 0.0009$; test for heterogeneity: $P < 0.00001$, $I^2 = 96\%$ in favor of conventional dentifrice; and for gingival inflammation, the SMD was 1.37; 95% CI: 0.49–2.26, $P = 0.002$; test for heterogeneity: $P < 0.00001$, $I^2 = 94\%$ which also was in favor of conventional dentifrice. Subgroup analysis for plaque intervention and gingival inflammation in case of long-term (more than 4 weeks and up to 6 months) and short-term effects (minimum of 4 weeks) of herbal dentifrice showed no difference when compared to conventional dentifrice. They concluded that there is no high-quality evidence to support or abnegate the anti-plaque and anti-gingivitis effects of the herbal dentifrice. Sunitha J et al compared the antimicrobial effect of few herbal dentifrices against cariogenic organism such as *Streptococcus mutans* and *Lactobacillus acidophilus*. This study was an in vitro model using the well method of microbial culture. Colgate total was used as the positive control and distilled water as the negative control. Dentifrices were prepared in 1:1 dilution using sterile distilled water. The standard strains were inoculated and incubated for 4 h. They were then lawn cultured. Wells were made using a standard template, and the dentifrices were placed in these wells Kruskal-Wallis test and Mann-Whitney test were used for statistical analysis. In case of *S. mutans*, the maximum antimicrobial effect among the six dentifrices was shown by Babool followed by Colgate Herbal. For *L. acidophilus*, the antimicrobial zone exhibited by all the six dentifrices were similar to the positive control. They concluded that Babool and Colgate Herbal have more inhibitory effect against *S. mutans* than the other dentifrices of the group. Dabur Red, Colgate Herbal, and Himalaya are efficient against *L. acidophilus*.^{9, 10}

Conclusion:

Within the limitations of the present study, it can be concluded that herbal and non-herbal toothpastes are effective in minimizing gingivitis and plaque removal. Any toothpaste can be used with a toothbrush using proper toothbrush movements to achieve good oral hygiene.

References:

1. Papapanou P.N. Epidemiology of periodontal diseases: an update. *J Int Acad Periodontol.* 1999;1:110–116.
2. Addy M., Moran J., Wade W. Chemical plaque control in the prevention of gingivitis and periodontitis. In: Lang N.P., Karring T., editors. *Proceedings of the First European Workshop on Periodontology.* Quintessence Publishing; London: 1994. pp. 244–257.
3. Owens J., Addy M., Faulkner J. An 18 week home-use study comparing the oral hygiene and gingival benefits of triclosan and fluoride toothpastes. *J Clin Periodontol.* 1997;24:626–631.
4. Al-Kholani AI. Comparison between the efficacy of herbal and conventional dentifrices on established gingivitis. *Dent Res J.* 2011;8(2):57–63.
5. Hosamane M, Acharya AB, Vij C, Trivedi D, Setty SB, Thakur SL. Evaluation of holy basil mouthwash as an adjunctive plaque control agent in a four day plaque regrowth model. *J Clin Exp Dent.* 2014;6(5):e491–e496. doi: 10.4317/jced.51479.
6. Abhishek KN, Supreetha S, Sam G, Khan SN, Chaithanya KH, Abdul N. Effect of Neem containing Toothpaste on Plaque and Gingivitis--A Randomized Double Blind Clinical Trial. *J Contemp Dent Pract.* 2015 01;16(11):880–883.
7. 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. doi:10.4103/2231-0762.146220
8. Al-Kholani AI. Comparison between the Efficacy of Herbal and Conventional Dentifrices on Established Gingivitis. *Dent Res J (Isfahan).* 2011;8(2):57-63.
9. Mehta V, Shetiya SH, Kakodkar P, Janakiram C, Rizwan SA. Efficacy of herbal dentifrice on the prevention of plaque and gingivitis as compared to conventional dentifrice: A systematic review and meta-analysis. *J Indian Soc Periodontol.* 2018;22(5):379-389. doi:10.4103/jisp.jisp_100_18
10. Sunitha J, Ananthalakshmi R, Jeeva JS, Jeddy N, Dhakshininamoorthy S, Muthu Meenakshi RM. Antimicrobial effect of herbal dentifrices: An in vitro study. *J Pharm Bioallied Sci.* 2015;7(Suppl 2):S628-S631. doi:10.4103/0975-7406.163575