



Short Communication

Evaluation of *Irimedadi Taila* as an adjunctive in treating plaque-induced gingivitis

Shweta Patil ^a, Siddhartha A. Varma ^{b,*}, Girish Suragimath ^b, Keshava Abbayya ^b, Sameer A. Zope ^b, Vishwajeet Kale ^b

^a School of Dental Sciences, Krishna Institute of Medical Sciences Deemed University, Karad, Dist.- Satara, Maharashtra state, 415110, India

^b Department of Periodontology, School of Dental Sciences, Krishna Institute of Medical Sciences Deemed University, Karad, Dist.- Satara, Maharashtra state, 415110, India

ARTICLE INFO

Article history:

Received 19 January 2017

Received in revised form

10 June 2017

Accepted 13 June 2017

Available online 12 October 2017

Keywords:

Gingivitis

Irimedadi taila

Plaque

ABSTRACT

Ayurvedic drugs have been used since ancient times to treat diseases including periodontal diseases. Oral rinses made from ayurvedic medicines are used in periodontal therapy to control bleeding and reduce inflammation. To evaluate the efficacy of herbal preparation (*Irimedadi taila*) on reduction of plaque induced gingivitis. A total of 100 volunteers with clinical signs of mild to moderate gingivitis were selected and assigned to Group A (only scaling done) and Group B (scaling along with the use of *Irimedadi taila*). After recording the clinical parameters, the patients were instructed to use 2–3 drops of *Irimedadi taila* and gently massage the gums twice daily in Group B and oral hygiene instructions were given to all patients. Plaque and gingivitis assessment were carried out using the plaque index (Silness and Loe, 1964), Gingival index (Loe and Silness, 1963), and modified sulcular bleeding index (Mombelli et al.) at baseline and at 21 days post treatment. Statistically analysis was carried out using the student's paired *t* test for intra group comparison and unpaired *t* test for inter group comparison. Results showed that *Irimedadi taila* is effective in reducing gingival index and gingival bleeding index scores in comparison to scaling alone and the values are statistically significant with $p < 0.0001$. *Irimedadi taila* is effective in treatment of plaque induced gingivitis and can be effectively used as an adjunct to mechanical therapy. © 2017 Transdisciplinary University, Bangalore and World Ayurveda Foundation. Publishing Services by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

Periodontal diseases are among the most common infectious diseases affecting mankind and can lead to destruction of the periodontal ligament, cementum, gingiva and alveolar bone. Dental plaque is the primary etiological factor in gingival and periodontal diseases [1]. Thus, control of dental plaque holds the key to halt the progression of periodontal diseases. Plaque control measures include both mechanical (toothbrushes, interdental brushes, floss) and chemical methods (mouthwashes) [2]. However, a majority of population does not possess the degree of

motivation and skill to effectively use the mechanical means of plaque control, therefore emphasizing the importance of adjunctive chemical plaque control [3].

Chemotherapeutic formulations provide chemically significant benefit in the reduction of plaque-induced gingivitis. Chlorhexidine is considered as the gold standard anti-plaque agent and has been serving the dental profession since a long time. However, it has certain unpleasant side effects like tooth staining, taste disturbance, etc [2].

Herbal formulations are more appealing because they work without alcohol, artificial preservatives, flavors or colors. Herbal products have shown promising results with minimal side effects. Also, the presence of naturally occurring phytochemicals has an additional effect on inflammatory pathways and antioxidant potential, making them eligible to be used as effective anti-gingivitis agents. These herbal ingredients are abundantly available, easily

* Corresponding author.

E-mail: siddhartha_varma@yahoo.co.in

Peer review under responsibility of Transdisciplinary University, Bangalore.

accessible, economically feasible and culturally acceptable. They possess minimal side effects and hence can be recommended for long term use [4].

Several natural herbs such as green tea, *tulsi*, *ajwain*, turmeric, *neem*, cranberry, aloe vera, pot marigold; *triphala* etc., have been effectively used in reducing plaque accumulation and gingival inflammation [5–12]. The major strength of these products is little or no incidence of side effects. *Irimedadi taila* is one such product which is less explored in treating gingival and periodontal diseases.

Irimedadi taila is an Ayurvedic oil used for a famous procedure called oil pulling or gargling. Oil pulling is an ancient Ayurveda procedure that involves swishing oil in the mouth for oral and systemic health benefits. The ingredients in the *taila* are as follows: *Yashti*, *Trijatha*, *Manjishta*, *Gayatri*, *Lodhra*, *Katphala*, *Kshirivrikshatwak*, *Irimedadi twak*, *Musta*, *Agaru*, *Shvetachandana*, *Rakta chandana*, *Karpoora*, *Jati*, *Takkola*, *Mamsi*, *Dhataki*, *Gairika*, *Mrinala*, *Mishi*, *Vaidedi*, *Padma-kesara*, *Kumkuma*, *Laksha*, *Samanga*, *Manjishta*, *Brihati*, *Bilvapatra*, *Suradruma*, *Shaileya*, *Sarala*, *Sprikka*, *Palasha*, *Rajani*, *Daruharidra*, *Priyangu*, *Tejani*, *Pradhakaleya*, *Pushkara*, *Jaya*, *Vyaghri*, *Madana*, *Tila taila* [13]. *Taila* is prepared by boiling with prescribed *kasayas* (decoction) and *kalkas* of drugs according to the formula. This process ensures absorption of the active therapeutic properties of the ingredients used [14]. *Irimedadi taila* is indicated in almost all *danta rogas* including stomatitis, glossitis, aphthous ulcers, dental caries, pyorrhea, gingivitis, stains removal and hyperemia of gums [15–17].

However, not many studies are conducted to evaluate the efficacy of *Irimedadi taila* on dental plaque and gingivitis. Hence, the present study was undertaken to evaluate the clinical efficacy of *Irimedadi taila* in reduction of plaque-induced gingivitis using modern parameters.

2. Material and methods

2.1. Patient material

The present study was a single blinded randomized clinical trial. The research protocol was approved by the Institutional Ethics Committee (KIMSDU/ICMR/STS/2015). Participants were informed about the purpose and design of the investigation and written informed consent was obtained. The patients for this study were selected from the Outpatient Department of Periodontology, School of Dental Sciences, Karad and the study period was from April to August 2015.

2.2. Selection criteria

The subjects in the age group of 20–45 years diagnosed with plaque-induced gingivitis and fulfilling the following criteria were selected for the study; minimum of 20 teeth present with no visible signs of untreated caries, presence of bleeding on probing and patients who have not received any periodontal therapy during the past 6 months. Subjects on antibiotics coverage or any other drugs within last 3 months, pregnant women and lactating mothers and medically compromised patients were excluded. Subjects with adverse habits like tobacco users in smoke or smokeless form and history of alcohol consumption were excluded. Subjects with periodontal pockets of 4 mm or more, those with partial dentures or clinically unacceptable restorations or bridges, orthodontic appliances and those with a known history of allergy to chemical or any herbal products were also excluded.

2.3. Study design

The study comprised of 100 patients who were randomly divided into two groups by using a coin toss method as follows:

Group A: (n = 50) Patients treated by oral prophylaxis.

Group B: (n = 50) Patients treated by oral prophylaxis along with the usage of *Irimedadi taila* as an adjunctive.

2.4. Clinical assessment

Prior to oral prophylaxis, patient's periodontal status was recorded using the following standard parameters: Plaque index, Gingival index and Gingival bleeding index.

After recording the clinical parameters in selected patients by a single blinded calibrated examiner, a thorough oral prophylaxis was carried out using ultrasonic scaler. All the patients were advised same set of oral hygiene instructions. The clinical parameters were reassessed on 21st day by the same blinded examiner.

2.5. Usage of *Irimedadi taila*

Patients in Group B were instructed to take 4/5 drops of *Irimedadi taila* (Shree Shanker Pharmacy, Ahmedabad) on the index finger tip and to massage over gums of both the arches for 2 min. After using *Irimedadi taila*, patients were advised to use lukewarm water for rinsing. Patients were instructed to use the herbal *taila* for 21 days and were asked to report immediately if they felt any discomfort in using the *taila* during the course of the study.

2.6. Statistical analysis

All statistical procedures were performed using Statistical Package for Social Sciences (SPSS) 20.0 software (IBM, Armonk, NY, United States of America). Tests applied were paired *t* test and unpaired *t* test.

3. Results

General characteristics

In total, 100 patients with plaque-induced gingivitis were included with 50 participants in each group. Mean ages of the participants in Group A were 22.5 ± 3.4 years (27 males and 23 females) and in Group B were 23.8 ± 1.8 years (21 males and 29 females), respectively.

The results showed a significant reduction in Plaque index, Gingival index and Gingival bleeding index scores among both the groups A and B with $p < 0.0001$ (Table 1). Further, on inter-group comparison, group B showed a statistically significant reduction in all periodontal parameters with $p < 0.0001$ (Table 2). However, relatively reduction in the mean plaque scores was more in group A.

Table 1

Intra-group comparison of Plaque index, Gingival index and Gingival bleeding index scores before and after treatment (Paired *t* test).

| | Before | After | <i>p</i> value |
|--------------------------------|---------------|--------------|----------------|
| Plaque index | | | |
| Group A | 1.39 ± 0.37 | 0.908 ± 0.36 | <0.0001 |
| Group B | 1.044 ± 0.414 | 0.77 ± 0.27 | <0.0001 |
| Gingival index | | | |
| Group A | 1.33 ± 0.41 | 1.006 ± 0.39 | <0.0001 |
| Group B | 1.14 ± 0.38 | 0.77 ± 0.26 | <0.0001 |
| Gingival bleeding index | | | |
| Group A | 25.50 ± 8.74 | 19.78 ± 6.81 | <0.0001 |
| Group B | 23.3 ± 5.26 | 16.54 ± 4.75 | <0.0001 |

Table 2

Inter-group comparison of mean differences of Plaque index, Gingival index and Gingival bleeding index (unpaired *t* test).

| | Group A Mean difference | Group B Mean difference | <i>p</i> value |
|-------------------------|----------------------------|----------------------------|----------------|
| Plaque index | 0.482 ± 0.01 | 0.274 ± 0.144 | 0.0001 |
| Gingival index | 0.324 ± 0.02 | 0.37 ± 0.12 | 0.0088 |
| Gingival bleeding index | 5.72 ± 1.93 | 6.76 ± 0.51 | 0.0004 |

Along with statistically significant reduction in index scores, clinically the condition improved from moderate gingivitis to mild gingivitis. Therefore, *Irimejadi taila* as an adjunct is effective in reducing Gingival index and Gingival bleeding index scores in comparison to scaling alone.

4. Discussion

Dental caries and periodontal diseases are the two most common diseases that are primarily caused by dental plaque. Chemical plaque control is generally considered as an adjunct to mechanical oral hygiene practices wherein agents are commonly delivered in toothpaste or mouthrinse vehicles. Ayurvedic drugs since ancient times are being used to control bleeding and reduce inflammation and treat periodontal diseases. *Irimejadi taila* is one such medicine which is less explored to assess its dental health benefits. Hence, the present study assessed and compared the efficacy of *Irimejadi taila* in reduction of plaque-induced gingivitis.

Irimejadi taila was dispensed in small quantities in a container and given to all the patients. The patients were recalled after every week with the containers to assess the usage of *taila* and were provided with refill as and when required till the 21st day. Reinforcement of advantages of *taila* over other products helped in motivating them to continue usage of *taila* thereby, ensuring patient compliance during the study period.

In the current study, significant reduction in Gingival index and Gingival bleeding index scores were observed among patients who used *Irimejadi taila*, which is effective in enhancing gingival health in comparison to scaling alone. No adverse effects were reported during the course of our study. These results are similar to a study done by Rao et al., where *Irimejadi taila* was effective in improving periodontal status in more than 80% of the study subjects [17]. Concurrent results were observed in a study done by Mali G V et al. who concluded that *Irimejadi taila* is equally effective to chlorhexidine gluconate as an adjunct to mechanical plaque control to prevent plaque accumulation and gingivitis [18]. Studies by Parwani et al., Aspalli et al., Rahmani et al. and Deshmukh et al. who compared the anti-plaque and anti-gingivitis effect of herbal mouthwashes showed similar results to our present study proving them to be equally effective to chlorhexidine mouthwash [8,19–21].

Irimejadi taila has *Gayatri* (*Acacia catechu*), *Manjishtha* (*Rubia cordifolia*), *Til* oil (*Sesamum indicum*), Clove (*Syzygium aromaticum*), *Arimaedah* (*Acacia farnesiana*/Casia flowers) and many other ingredients. *Gayatri* has been proven for its astringent and bactericidal properties; *Manjishtha* acts as an astringent, analgesic, anti-inflammatory blood purifier; clove is an analgesic, anti-caries and antimicrobial agent; *til* oil acts as anti-plaque and anti-gingivitis agent [18,22,23]. The oil of cassia flowers contain benzaldehyde; salicylic acid, methyl salicylate, benzyl-alcohol aldehyde and essential oil all of which are responsible for its astringent, demulcent and alterative action therefore useful in controlling bleeding gums [24,25].

The improvement in gingival health in Group B might have been due to these ingredients present in the *Irimejadi taila*. In addition to

the benefits of herbal contents in the *Irimejadi taila*, use of finger for massaging the gum results into increased keratinization and improved gingival blood flow thereby contributing to reduction in gingival inflammation [26]. However, the exact mechanism of action of the *Irimejadi* ingredients on gingival health needs to be explored.

The Ayurvedic *taila* used in the study was effective in improving gingival health; however, the common feedback obtained from the patients was about the bitter taste which could pose a problem towards their compliance in long-term usage. Thus, the possibility of adding some flavoring or sweetening agents without compromising on the chemical properties of the ingredients has to be explored.

5. Limitations

The limitations of the study are a small sample size with short follow-up period and lack of microbiological investigations to support the clinical findings. Further longitudinal studies with larger sample size are necessary to see the long-term effects of *Irimejadi taila*. Similarly, further clinical trials are required to check for its minimum inhibitory concentration, substantivity and its effects on systemic health.

6. Conclusion

Within the limits of this clinical study, it can be concluded that *Irimejadi taila* is effective in controlling plaque-induced gingivitis when used as an adjunct to mechanical plaque control measures. Furthermore, it can serve as a natural alternative for patients who wish to avoid alcohol, and other side effects associated with chlorhexidine mouthrinse.

Sources of Funding

None.

Conflict of interest

None.

References

- [1] Page RC, Kornman KS. The pathogenesis of human periodontitis: an introduction. *Periodontol* 2000;1997(14):9–11.
- [2] Malhotra R, Grover V, Kapoor A, Saxena D. Comparison of the effectiveness of a commercially available herbal mouthrinse with chlorhexidine gluconate at the clinical and patient level. *J Indian Soc Periodontol* 2011;15(4):349–52.
- [3] Kaur H, Jain S, Kaur A. Comparative evaluation of the anti-plaque effectiveness of green tea catechin mouthwash with chlorhexidine gluconate. *J Indian Soc Periodontol* 2014;18:178–82.
- [4] Rao NJ, Subhas KR, Kumar KS. Role of Phytotherapy in gingivitis; a review. *Int J Pharmacol* 2012;8:1–5.
- [5] Yates R, Shearer BH, Huntington E, Addy M. A method to compare four mouthrinses: time to gingivitis level as the primary outcome variable. *J Clin Periodontol* 2002;29:519–23.
- [6] Slot DE, Lindeboom R, Rosema NA, Timmerman MF, van der Weijden GA. The effect of 0.12% chlorhexidine dentifrice gel on plaque accumulation: a 3-day non-brushing model. *Int J Dent Hyg* 2007;5:45–52.
- [7] Mali AM, Behal R, Gilda SS. Comparative evaluation of 0.1% turmeric mouthwash with 0.2% chlorhexidine gluconate in prevention of plaque and gingivitis: a clinical and microbiological study. *J Int Soc Prev Community Dent* 2012;16:386–91.
- [8] Parwani SR, Parwani RN, Chitnis PJ, Dadlani HP, Saiprasad SV. Comparative evaluation of anti-plaque efficacy of herbal and 0.2% chlorhexidine gluconate mouthwash in a 4day plaque regrowth. *J Indian Soc Periodontol* 2013;17:72–7.
- [9] Chatterjee A, Saluja M, Singh N, Kandwal A. To evaluate the antigingivitis and antipalque effect of an *Azadirachta indica* (neem) mouthrinse on plaque induced gingivitis: a double-blind, randomized, controlled trial. *J Indian Soc Periodontol* 2011;15:398–401.

- [10] Khairnar MR, Karibasappa GN, Dodamani AS, Vishwakarma P, Naik RG, Deshmukh MA. Comparative assessment of cranberry and chlorhexidine mouthwash on streptococcal colonization among dental students: a randomized parallel clinical trial. *Contemp Clin Dent* 2015;6:35–9.
- [11] Ajmera N, Chatterjee A, Goyal V. Aloe vera: its effect on gingivitis. *J Indian Soc Periodontol* 2013;17:435–8.
- [12] Khairnar MS, Pawar B, Marawar PP, Mani A. Evaluation of *Calendula officinalis* as an anti-plaque and antigingivitis agent. *J Indian Soc Periodontol* 2013;17:741–7.
- [13] Bhaisajyaratnavali – Kaviraj Govinda Das Sen edited with Siddhipradahindi commentary by Prof. Sidhinandam Mishra. Chapter 61 “Mukharogadhikar”, *Irimedaditaila*, slok no. 129–133.
- [14] The ayurvedic pharmacopeia of India, Part: II, Vol: II, 1st ed. Dept. AYUSH, Govt. of India, New Delhi.
- [15] *Agnivesa's Charaka Samhita*: Vol. I. Sutra Sthana. Dr. Ramakaransharma Vaidya Bhagwandas.
- [16] Amruthesh S. Dentistry and ayurveda – IV: classification and management of common oral diseases. *Indian J Dent Res* 2008;19:52–61.
- [17] Boloor VA, Hosadurga R, Rao A, Jenifer H, Pratap S. Unconventional dentistry in India – an insight into the traditional methods. *J Trad Complement Med* 2014;4(3):153–8.
- [18] Mali GV, Dodamani AS, Karibasappa GN, Vishwakarma P, Jain VM. Comparative evaluation of arimedadi oil with 0.2% chlorhexidine gluconate in prevention of plaque and gingivitis: a randomized clinical trial. *J Clin Diagn Res* 2016;10(7):ZC31–4.
- [19] Aspalli S, Shetty VS, Devarathamma MV, Nagappa G, Archana D, Parab P. Evaluation of anti-plaque and antigingivitis effect of herbal mouthwash in treatment of plaque induced gingivitis: a randomized, clinical trial. *J Indian Soc Periodontol* 2014;18:48–52.
- [20] Rahmani ME, Radvar M. The antiplaque effects of *Salvadora persica* and *Padina* essential oil solution in comparison to chlorhexidine in human gingival disease; a randomized placebo controlled clinical trial. *Int J Pharmacol* 2005;1:311–5.
- [21] Deshmukh MA, Dodamani AS, Karibasappa G, Khairnar MR, Naik RG, Jadhav HC. 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):ZC13–6.
- [22] Devi Priya M, Siril EA. Traditional and modern use of Indian madder (*Rubiacordifolia* L.): an overview. *Int J Pharm Sci Rev Res* 2014;25:154–64.
- [23] Kothiwale SV, Patwardhan V, Gandhi M, Sohoni R, Kumar A. A comparative study of antiplaque and antigingivitis effects of herbal mouthrinse containing tea tree oil, clove, and basil with commercially available essential oil mouthrinse. *J Indian Soc Periodontol* 2014;18(3):316–20.
- [24] Nadakarni KM. *Materia medica*. 3rd ed. vols. I, II; 1976.
- [25] Pandey G. *Dravyagunavignyana*. 1st ed. vols. I, II; 1998.
- [26] Perry DA, Beemsterboer PL, Essex G. *Periodontology for the dental hygienist*. 4th ed. St. Louis, Missouri: Elsevier Saunders; 2014. p. 198.