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Evaluation of antiplaque and antigingivitis effect of herbal mouthwash in treatment of plaque induced gingivitis

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Abstract

Introduction: 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. The aim of this clinical study is to verify the efficacy of herbal mouthwash containing *Pilu*, *Bibhitaka*, *Nagavalli*, *Gandhapura taila*, *Ela*, *Peppermint satva*, and *Yavani satva* on reduction of plaque and gingivitis.

Materials and Methods: 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 herbal mouthwash). After recording the clinical parameters, the patients were instructed to use herbal mouthwash 15 ml for 30 s twice daily after food 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), Gingival bleeding index (Ainamo and Bay, 1975) at baseline and at 21 days of the herbal mouthwash use. Statistically analysis was carried out using the student's *t*-test for normally distributed data.

Results: Our results showed that herbal mouthwash was effective in treatment of plaque induced gingivitis in Group B when compared with the Group A.

Conclusion: Herbal mouthwash is effective in treatment of plaque induced gingivitis and can be effectively used as an adjunct to mechanical therapy with lesser side-effects.

Keywords: Antiplaque, antigingivitis, herbal mouthwash

Introduction

Periodontal diseases affect the supporting tissues of the teeth. Gingivitis, the mildest form of periodontal disease is generally caused by insufficient oral hygiene^[1]. Gingivitis is characterized by inflammation and bleeding of the gums. The main cause of gingivitis is plaque that forms on the surface of teeth and gums. As a main stay to maintain oral hygiene, mechanical plaque control measures are used. Mechanical plaque control techniques are time consuming and require motivation and skill to be performed well; hence, antimicrobial agents have been employed extensively as an adjunct to mechanical cleaning. Several antimicrobial chemical agents such as chlorhexidine, metronidazole etc., have been used. However, these artificial drugs have unpleasant side-effects; so researchers are trying to pay more attention to herbal drugs. Phytotherapy has a long history and has been used world-wide. Plants and plants isolates demonstrates effects that are immune enhancing, anti-inflammatory, anti-cancer etc. (Lee, 2005)^[2]. Development in alternative medicine research has led to many mouthrinses and tooth-pastes based on plant extracts (Ozaki *et al.* 2006)^[2]. The aim of this clinical study is to verify the efficacy of herbal mouthwash containing *Pilu*, *Bibhitaka*, *Nagavalli*, *Gandhapurataila*, *Ela*, *Peppermint satva*, *Yavani satva* on reduction of plaque and gingivitis.

Methodology

Inclusion criteria

- Healthy patients 20-45 years.
- Minimum of 20 teeth should be present in the dentition, no visible signs of untreated caries.
- Patient diagnosed with mild to moderate type of gingivitis.

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- Patient with bleeding on probing present, clinically.
- Patient who had not received any periodontal therapy for the past 6 months.
- Patient willing to give the informed consent and willing to comply with the study were selected.

Exclusion criteria

Subjects taking antibiotics or any other drugs within last 3 months.

- Pregnant women and lactating mothers.
- Medically compromised patients.
- Smokers.
- Patients who had periodontal pockets in excess of 4 mm.
- No partial dentures or clinically unacceptable restorations or bridges.
- Patient with orthodontic appliances.
- Patient with a known history of allergic to chemical or any herbal products.

Materials used

Materials used were herbal Mouthwash (HiOra[*HiOra Mouthwash Regular- Manufactured by the Himalaya Drug Company Makali, Bangalore 562123 (India).]), each gram of HiOra * mouthwash containing Pilu (*Salvadora persica*) - 5.0 mg, Bibhitaka (*Terminalia bellerica*) - 10 mg, Nagavalli (*Piper betel*) - 10 mg, Gandhapura taila - 1.2 mg, Ela - 0.2 mg, Peppermint satva - 1.6 mg, Yavanisatva - 0.4 mg. Other materials used were Mouthmirror, Williams's periodontal probe, explorer, and ultrasonic scalers.

Group distribution

Patients were randomly assigned to Group A and Group B and an informed consent was obtained from all the patients.

Group A: Patients were treated by scaling alone without the

use of herbal mouthwash.

Group B: Patients were treated by scaling along with the usage of herbal mouthwash.

Clinical parameters

Prior to scaling, patient was subjected to assessment of the following clinical parameters.

Plaque index (Silness and Loe, 1964)

Gingival index (Loe and Silness, 1963)

Gingival bleeding index (Ainamo and Bay, 1975).

After recording the clinical parameters in selected patients, a thorough scaling was carried out using ultrasonic scalers in Group A and Group B. The recording of clinical parameters was carried out by main investigator and treatment was carried out by co-investigator. The clinical parameters were assessed on day '0' and 21st day.

Usage of mouthwash

After recording of clinical parameters by the main investigator, patients in Group B were instructed to use herbal mouthwash 15 ml for 30 s twice daily after food that is after breakfast and dinner in order to reduce the bias following brushing in both groups and more over the mouthwashes serve as a popular and simple delivery method that eliminates the bacteria and rinse the food debris from the mouth thereby preventing plaque formation. Oral hygiene instructions were given to all patients.

The results showed that there was a significant reduction in plaque scores, gingival index scores, and gingival bleeding index scores both in the Group A and the Group B following scaling. However, a greater reduction in Plaque index scores, gingival index scores, and Gingival bleeding scores were seen in Group B compared with the Group A.

Table 1: Inter group comparison of plaque index, gingival index, and gingival bleeding index

	Group A	Group B	Mean difference	P value
Plaque index	1.132±0.35	0.66±0.216	0.471	<0.0001 h
Gingival index	0.896±0.311	0.724±0.2	0.173	<0.0014 h
Gingival bleeding index	38.597±16.562	23.802±18.647	14.795	<0.0001 h

Discussion

The chemical plaque control is generally considered to be an adjunct to mechanical oral hygiene practices: Agents being most commonly delivered in toothpaste or mouthrinse vehicles^[3]. The evaluation of antiplaque agents or formulations typically uses a step-by-step series of clinical study protocols, often supported by laboratory tests, finally culminating in the home-use study (Addy 1995 and Addy and Moran 1997)^[3, 4]. The classic experiments of Loe *et al.*, (1965)^[5] demonstrated that accumulation of microbial plaque results in the development of gingivitis and its removal and control results in resolution of the lesions in humans, thereby plaque proving as the microbial etiology of the disease as mentioned by Page (1986)^[6]. Research centers and World Health Organization prepare lots of programs to make use of plant extracts^[7]. Finding plants that have antimicrobial effects and using them as mouthwash have advantages, such as a decreased side-effects and also they are more economical. 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.^[8] Dee *et al.*, (1999) evaluated 35 different Indian spices traditionally used. Evidence shows that the herbs such as *Bibhitaka* (*T.*

bellerica) one of the ingredients of highly praised Ayurvedic compound triphala, used both, internally as well as externally has many of the properties such as astringent, laxative, used in treatment of skin diseases, respiratory diseases etc.,^[9] *Nagavalli* (*P. betle*) shows the antioxidant, anti-inflammatory, antiplatelet, antimicrobial etc.,^[10] *Pilu* (*S. persica*) shows antioxidant activity^[11], peppermint that contain menthol activates cold-sensitive TRPM8 (family of Transient receptor potential ion channels, M stands for melastatin) receptors in the skin and mucosal tissues, and is the primary source of the cooling sensation that follows the topical application of peppermint oil also used as a flavoring agent in tooth pastes, ice creams, confectionaries, chewing gums etc.,^[12] *Ela* is an effective gargle in bad odor of the oral cavity and dental ailments. The paste is also beneficial in the skin diseases, chronic ulcers, and pruritus. *Ela* oil is used with great benefit in toothache due to infections,^[13] *Gandhapura taila* has analgesic, anti-inflammatory effect used in treatment of joint pains. Here, a first attempt has been made to use these herbal plants in the form of herbal mouthwash. This study was carried out to see the efficacy of herbal plant mouthwash containing *Pilu* (*S.persica*), *Nagavalli*, *Gandhapura taila*, *Ela* (*Cardamomum*), *Peppermint satva*, and *Yavani satva* in treatment of gingivitis as an adjunct to scaling. Earlier studies

shows evidence of usage of herbal mouthwashes such as Turmeric, ^[14] neem, ^[15] and triphala,^[8] compared to chlorhexidine showed a significant reduction in plaque indices scores, gingival indices scores, and gingival bleeding index scores as in the present study with a value of plaque index (PI) <0.0001, gingival index (GI) <0.0014 and gingival bleeding index (GBI) <0.0001. The effectiveness of herbal mouthrinse likely was due to the ingredients such as *Bibhitiki*, *Pilu*, *Gandhapura tailum*, which has antimicrobial, anti-inflammatory property. Moreover, the ingredients *Ela*, *Nagavelli* it has an added effect on reducing the oral malodor. Though chlorhexidine was developed in 1950, which is still considered one of the most effective antiplaque agents in dentistry. However, long-term usage is limited by its disagreeable taste and propensity to stain the teeth brown ^[16]. Therefore, a new formulation with similar or superior efficacy and possible with less side-effects and long effect need to be investigated. This herbal mouthwash showed no adverse effects and no staining of teeth with the usage of mouthwash. Limitations of the study were it was dependent on the patient compliance and the study was of short duration.

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