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Original Article

Comparative evaluation of oil pulling and chlorhexidine mouthwash in halitosis: A randomized controlled trial

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Abstract

Background : Halitosis is an unpleasant malodour from the oral cavity that might be due to systemic origin or oral issues origin. Oil pulling in addition to offering several oral health benefits has also beneficial effects on overall health. The present study aims to evaluate the efficacy of oil pulling when compared to the chlorhexidine mouthwash usage.

Methodology : It was a parallel design, single centre, double blinded randomized controlled trial of 15 days duration. The control group received Chlorhexidine mouthwash (Hexidine mouthwash) and study groups were provided with sesame oil. Halitosis was assessed by arbitrary 0-5 scale for organoleptic odor assessments. Gingivitis was evaluated using Löe and Silness index and plaque with Silness and Löe index.

Results : The mean organoleptic scores at baseline, 15 days post intervention were 4.01 and 1.30 for chlorhexidine. The mean organoleptic scores at baseline, 15 days post intervention were 2.32 and 1.11 for sesame oil pulling group.

Conclusion : It can be concluded that oil pulling is useful in reducing halitosis, plaque and gingivitis.

Keywords : Halitosis, oil pulling, chlorhexidine, mouthwashes

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INTRODUCTION

Halitosis is characterized by unpleasant odours arising consistently from the oral cavity. With up to 50% of people worldwide assessing themselves as having frequent or constant incidents of malodor, it is a common complaint of many adults (1). The origin of halitosis may be related both to systemic and oral conditions, but a large percentage of cases, majorly related to an oral cause. Halitosis is often caused by food debris and biofilm buildup on the teeth and tongue. The odour arising from the oral cavity is caused by the oral microbial putrefaction of the debris, resulting in the production of volatile sulfur compounds (VSCs). Systemic conditions also produce volatile compounds which are excreted through exhaled air, contributing to halitosis (1). For oral diseases, mechanical removal of biofilm with microbes is the first step in control of halitosis. Dentrifices and oral rinses have long been used to reduce halitosis via chemotherapeutic reduction. The most common active ingredients included in these products are triclosan, essential oils, cetylpyridinium chloride (CPC) and CHX (2). Zinc, another active ingredient in mouthwash, has been shown to be efficiently by decreasing bacterial breakdown of proteins, thus inhibiting VSC production (3).

Chlorhexidine is one of the most popularly tested antimicrobial agent for its efficacy in the treatment of oral bad breath (4). It has been shown to be successful in decreasing the microbial load, but it has disadvantages of tooth staining (5) (6).

Oil pulling is claimed to improve oral health. It came into sight and popularity by Dr F Karach (7). Oil pulling is mentioned in the ayurvedic text Charak Samhita and Sushruta Samhita as ‘Kavala Graha’ or ‘Kavala Gandoosha’. In Gandoosha mouth is completely filled with oil so that gargling is difficult while in Kavala Graha comfortable lesser quantities of oil is used so that gargling is possible (8).

The aim of the present study is to compare the efficacy of oil pulling and use of chlorhexidine mouthwash on halitosis.

MATERIALS & METHODS

It was a parallel design, single centre, double blinded randomized controlled trial of 15 days duration. The sample was selected from the dental camps in and around of Chennai. The participants were informed about the study and written consent was. Sample Size of 65 subjects was calculated with (α) of 0.05, power (β) of 80% and minimum expected difference between the two means of 0.1 (9). Assuming possible losses of 20%, the numbers was adjusted to 15 subjects per group. A total of 300 participants were screened, out of which 65 subjects were included. The criteria for halitosis diagnosis was the presence or absence of halitosis after tooth brushing, mouth rinsing, eating or drinking for at least 1 hour prior to the examination and to rinse with water at least 10 minutes before the examination to protect xerostomia effect and not to talk for at least 5 minutes. The subjects were ramdomized into two groups by a lot method. After baseline examination and saliva collection, the participants in both the groups were provided with mouthrinse. The control group received Chlorhexidine mouthwash (Hexidine mouthwash) and study groups were provided with sesame oil. The test materials were provided in opaque containers to Group 1: Chlorhexidine mouthwash, Group 2: Oil. The investigator and patient were blinded for the test material. They were advised to use 10 ml twice daily for 15 days.

Initial evaluation was done after the first 7 days. At the end of the experiment, oral hygiene instructions and oral prophylaxis were given to all the participants. Single trained and calibrated investigator did the data collection at baseline and 15 days using arbitrary 0-5 scale for organoleptic odor assessments. Gingivitis was evaluated using Löe and Silness index (1963) and plaque with Silness and Löe index (1964) and at last 5ml of the subjects’ unstimulated saliva was collected in 10ml glass vials which were then sealed using rubber septum and incubated at 37°C for 24 hours.

Inclusion criteria

- 25 age-matched healthy adolescents,
- Should have at least 24 permanent teeth with gingival probing depth < 3 mm and
- Gingival and plaque index score = 1 in more than 10% of the sites

Exclusion criteria

- History of antibiotics for past 3-4 weeks,
- Wearing orthodontic appliances, prosthesis,
- Smokers and participants with deep-fissured tongue

Organoleptic assessment:

The participants were asked to keep their mouths completely closed for 3 min, breathing only through the nose. After the time had elapsed they were instructed to release the air slowly through the mouth from a distance of 10 cm from the examiner's nose. Asking the participant to lick his wrist and smell it after it has dried constituted the self-assessment part. The intensity ratings of 0 to 5 score, as proposed by Rosenberg and McCulloh was used (10).

Score 0 = No odor present

Score 1 = Barely noticeable odor

Score 2 = Slight but clearly noticeable odor

Score 3 = Moderate odor

Score 4 = Strong offensive odor

Score 5 = Extremely foul odor

RESULTS

Comparision of organoleptic scores, plaque score and gingival score at baseline, 15 days post intervention were analysed comparatively using independent t test. The mean value of organoleptic scores, plaque score and gingival score at baseline, 15 days post intervention were tabulated with standard deviation.

Table 1: Comparision of organoleptic scores, plaque score and gingival score at baseline

	Chlorhexidine Mean (SD)	Oil Mean (SD)	P value
Organoleptic score	4.01(0.61)	2.32(0.31)	<0.001
Plaque score	1.67(0.11)	1.21(0.21)	
Gingival score	1.10(0.27)	1.01(0.32)	

Table 2: Comparision of organoleptic scores, plaque score and gingival score after 15 days post intervention

	Chlorhexidine Mean (SD)	Oil Mean (SD)	P value
Organoleptic score	1.30(0.667)	1.11(0.31)	<0.001
Plaque score	1.59(0.31)	1.18(0.61)	
Gingival score	1.55(0.19)	1.21(0.34)	

DISCUSSION:

The present trial was done to evaluate the effectiveness of Chlorhexidine and oil pulling in reducing halitosis of oral origin. Subjects with moderate to severe halitosis were included in the trial. Chlorhexidine di-gluconate is the most widely studied and is considered as gold standard for gingiva. The most commonly prescribed concentration is 0.2% hence, this was considered in the study (11). In the present study, chlorhexidine significantly reduced the mean, organoleptic, gingival and plaque scores from baseline to day 15.

Study by Sharath et al in 2011 showed that the oil pulling therapy has similar effectiveness like chlorhexidine against halitosis and organisms which are associated with halitosis. Sesame oil has the following advantages over chlorhexidine: no staining, no lingering after taste, and no allergy. Sesame oil is five to six times cost-effective than chlorhexidine and is readily available in the household. There are no disadvantages for oil pulling therapy except for the extended duration of the procedure compared with chlorhexidine.

Extensive studies with larger samples, varying time periods, and longtime follow-up should be carried out to establish the efficacy of oil pulling therapy in prevention of halitosis. The exact mechanism of action of oil pulling therapy is still not clear and we are currently carrying out research in this area. More studies with sesame oil can open new doors in the field of research in oral health care.

4 researchers in their study involving adolescents of age 16–18 years with plaque induced gingivitis, found statistically significant reduction in plaque and gingival indices because of oil pulling with coconut oil. The study observed decrease in gingival and plaque indices after 4 weeks which is similar to results produced by chlorhexidine di gluconate (12).

5 researchers in a randomized controlled pilot concluded that oil pulling with sesame oil is as effective as chlorhexidine to reduce halitosis and bacteria producing it. The subjects did oil pulling once daily for 10 min before tooth brushing for 2 weeks. Modified gingival index score, plaque index score, organoleptic breath assessment score, self assessment of breath score and BANA test scores reduced in both chlorhexidine and oil pulling groups (13)

To eliminate bias, the participants were instructed to follow their routine oral hygiene practices. Examination might have produced some bias in the study, as the participants might get over cautious and start following meticulous oral hygiene practices. But such a phenomenon might have occurred in all the groups.

CONCLUSION:

It can be concluded that oil pulling is useful in reducing halitosis, plaque and gingivitis. However, it may not have the efficacy of chlorhexidine and mouthrinses but with its no side effects & cost effectiveness, can be an effective & affortable to deal with halitosis. In a public health setting, where regular follow-ups are difficult due to lack of compliance on part of the patient, oil pulling can be safely prescribed to such patients for longer duration of time.

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Conflicts of interest

There are no conflicts of interest

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