

Oil pulling as an adjunct to scaling and root planing: A Clinico-Microbial study

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ABSTRACT : Oil pulling is an Indian folk remedy with both systemic and dental benefits ranging from strengthening of teeth, gums and jaws, preventing decay, oral malodor and bleeding gums. However, there is limited scientific data illustrating the role of oil pulling as an adjunct to Scaling and root planing. The aim of this study was to evaluate the anti-plaque effect of sesame oil pulling and its influence on plaque induced gingivitis as compared to chlorhexidine mouth wash. Forty patients with plaque induced gingivitis were treated with scaling and root planing following this randomly twenty patients performed oil pulling procedure for 14 days (test) and twenty patients used Chlorhexidine mouthwash for 14 days (control). Plaque scores using Plaque index by Silness and Loe 1967, Gingival Index by Loe and Silness 1963 and Colony forming unit counts of bacteria were assessed at baseline and after 14 days. Furthermore patient acceptance from either group was evaluated using a questionnaire.

Conclusion: The oil pulling therapy showed a reduction in the plaque index scores, gingival index scores, and total colony counts of aerobic microorganisms in the patients with plaque-induced gingivitis in adjunct with scaling and root planing .

KEYWORDS - Oil pulling, Plaque-induced gingivitis, Scaling & Root planing, Sesame oil

I. INTRODUCTION

Gingivitis is one of the most commonly found oral diseases. It is the initial stage of periodontal disease that occurs due to the colonization of plaque microorganisms on the tooth. Antibacterial mouthrinses like Chlorhexidine are used as an adjunct to mechanical plaque control. Chlorhexidine is considered as the “gold standard” but there are a few disadvantages associated with the long term use like altered taste sensation, staining of the teeth, altered taste sensation¹. There is a requirement for a long term, home based remedy which is also economical.

Oil pulling or oil swishing, is a traditional Indian folk remedy that involves swishing oil in the mouth for oral and systemic health benefits. Oil pulling has been used extensively as part of alternative medicine for many years to prevent decay, oral malodor, bleeding gums, dryness of the throat, and cracked lips and for strengthening teeth, gums, and the jaw. Oil pulling therapy can be done using edible oils like sunflower or sesame oil. Sesame oil is considered to be the queen of oil seed crops because of its beneficiary effects.

For oil pulling therapy, a tablespoon (or teaspoon for children between 5-15 years of age) of sesame oil is given in the mouth and is sipped, sucked, and pulled between the teeth for 10 to 15 minutes. The viscous oil turns thin and milky white. This oil should not be swallowed as it contains bacteria and toxins. Oil pulling therapy should preferably done on an empty stomach in the morning, followed by brushing of the teeth .

Limited literature or scientific proof is available to accept oil pulling therapy as a preventive adjunct to scaling and root planing. Therefore, the aim of the present, clinical study was to clinically evaluate the anti-plaque effect of sesame oil pulling and its influence on plaque induced gingivitis as compared to chlorhexidine mouth wash.

II. MATERIAL AND METHODS

2.1 Subject Selection

The study included forty systemically healthy patients with plaque induced gingivitis, who were referred for treatment to the Department of Periodontology, MGV's KBH Dental college and hospital, Nashik. Patients were included in the study after having signed an informed consent. Patients were randomly divided equally into two groups which were Test group consisting of Scaling and root planing plus Oral hygiene measures along with sesame oil pulling (SOP) and Control group consisting of Scaling and root planing plus oral hygiene measures along with Chlorhexidine mouthwash(CHX) .

Materials used

1. Sesame oil sachets containing 10 ml per sachet
2. CHX mouthwash bottles of 100 ml

Inclusion Criteria:

1. Subjects with plaque induced gingivitis
2. Subjects having at least 20 permanent natural teeth

Exclusion Criteria:

1. Use of antibiotics or mouthwash in the past 3 months
2. Pregnancy/lactating women
3. Smokers (past and current)
4. Children below age of 15 years.

The following clinical parameters were assessed at baseline and at 14 days:

1. Plaque Index (PI) of Loe and Silness 1967
2. Gingival Index (GI) Of Silness and Loe 1963
3. Total colony count-colony forming units
4. A common, self-administered questionnaire to evaluate patient acceptance (After 14 days follow up)

All clinical measurements were made at four sites per tooth: mesio-facial, mid-facial, disto-facial, palatal/lingual by the same examiner.

2.2 Study Design

The study performed was a randomized clinical trial. Each subject was assigned a specific number and simple random sampling was done using a table of random numbers. All subjects were treated with Scaling and root planing with ultra-sonic instrumentation and appropriate oral hygiene instructions were given followed by measurements of baseline Plaque scores and Gingival index scores. The test group was instructed to perform oil pulling with sesame oil, one tablespoon of sesame oil on an empty stomach first thing in the morning for the next 14 days. The sesame oil sachets were provided to them. The Control group were instructed to rinse with 0.2% CHX mouthwash for 30 seconds, twice a day for next 14 days. Chlorhexidine mouth wash was provided to them. At baseline all subjects were instructed to wash their mouth with physiological saline (0.85% NaCl).This saline is collected in a sterile container and is serially diluted and plated in Mueller hinton Agar plates. The plates were incubated aerobically at 37°C for 48hrs. After this incubation period the number of colonies present in 1ml of the saline was calculated by the formulae

$$\text{Number of bacteria/ml} = \text{Number of colonies} \times \text{dilution} \times \text{Amount plated}$$

The participants of both the groups were instructed to brush their teeth as per their daily home oral hygiene schedule. The pre and post procedural values of the plaque and gingival index scores and the total colony forming unit count were compared. At the end of 14 days, patient acceptance of Oil pulling as well as Chlorhexidine mouthwash from either group was evaluated using a common, self administered questionnaire.

Fig 1: Colony forming units

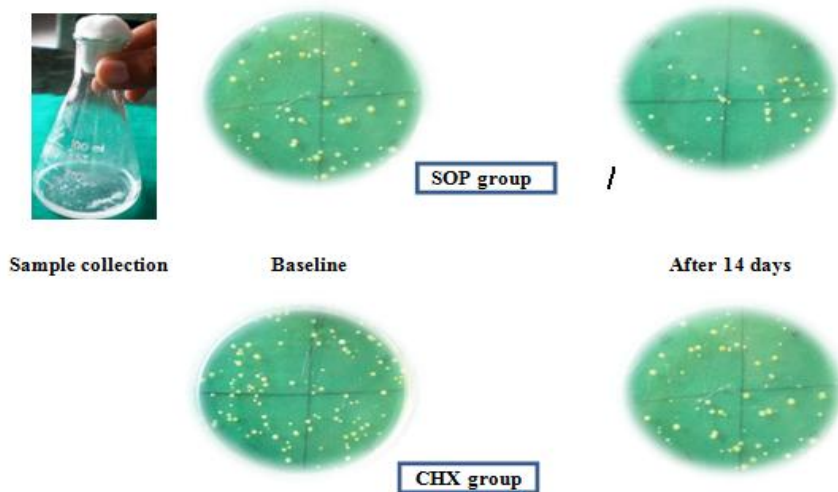


Fig 2: Gingival Index

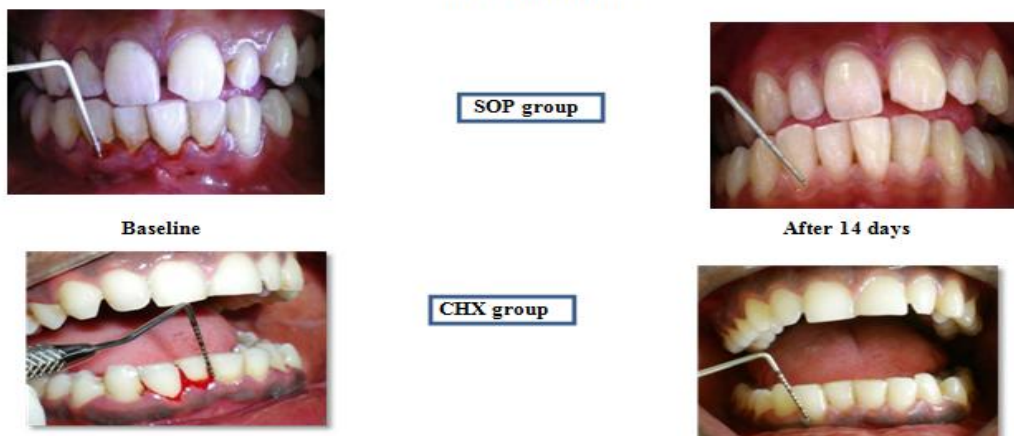


Fig 3: Plaque Index



QUESTIONNAIRE

YES/NO & COMMENT

1. HOW MANY TIMES IN A DAY DO YOU HAVE TO USE THE GIVEN SAMPLE?
2. IN THE LAST 14 DAYS HAVE YOU EVER FORGOTTEN TO USE THE GIVEN SAMPLE?
3. DID YOU EXPERIENCE ANY ALTERED TASTE AFTER USING THE SAMPLE?
4. IS THERE ANY TINGLING/BURNING SENSATION IN THE MOUTH AFTER USING THE SAMPLE??
5. HAVE YOU EXPERIENCED ANY PROBLEM WITH THE TASTE OF THE MEDICATION?
6. ANY EFFECT YOU HAVE FELT ON MOUTHBREATH AFTER USING THE GIVEN SAMPLE??
7. WOULD YOU LIKE TO CONTINUE TO PERFORM THE PROCEDURE AS PART OF YOUR ORAL HYGIENE REGIMEN?

Fig 4: Questionnaire used to evaluate patient acceptance

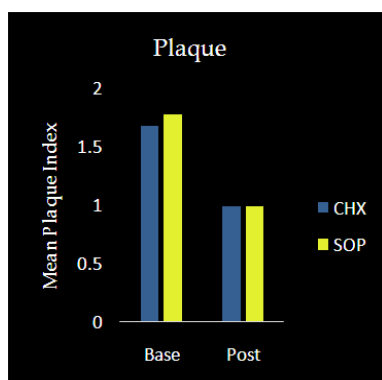
III. RESULTS:

Table (1) shows the mean scores of Plaque index, Gingival index and Colony forming unit count at baseline and after 14 days follow up. Mean scores of Plaque Index was 1.86 for the test group and 1.68 for the control group while the Gingival Index score for the test group and the control group was 1.63 and 1.57 mm respectively. Colony forming units were 11.9K CFU/ml for the test group and 12.1K CFU/ml for the control group. Results showed that the Plaque score reduced to 0.9 in test group and 0.88 in control group as depicted in the Graph (1), whereas the Gingival Index score was seen to reduce to 0.76 in test group and 0.87 in control group as depicted in Graph (2). Colony forming units were also reduced to 66K CFU/ml and 71K CFU/ml in both test group and control group respectively as depicted in Graph (3).

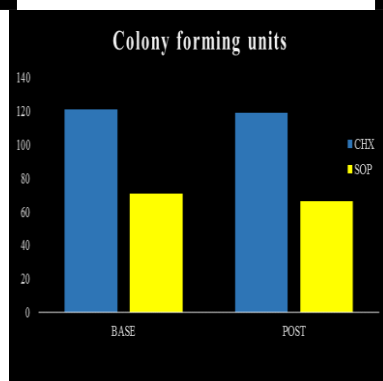
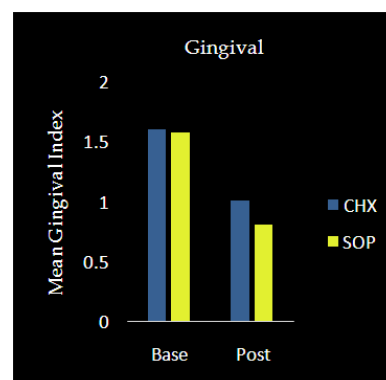
Table 1. Mean scores of Plaque Index, Gingival Index and Colony forming units at baseline and after 14 days follow up

Group Parameters	Test group (SOP)				Control group (CHX)			
	Baseline	14 days follow up	Mean difference	Percentage difference	Baseline	14 days follow up	Mean difference	Percentage difference
Plaque index	1.86	0.9	0.96	51.6%	1.68	0.88	0.8	47.61%
Gingival index	1.63	0.76	0.87	53.37%	1.57	0.87	0.7	44.58%
Colony forming units	11.9K CFU/ml	66K CFU/ml	53K CFU / ml	44.5%	12.1K CFU/ml	71K CFU/ml	58.9K CFU/ml	41.3%

Graph No.1: Comparison of plaque scores



Graph No.2: Comparison of Gingival Index scores



Graph No.3: Comparison of Colony forming units

Patient acceptance: As represented in Fig (4) patient acceptance was evaluated through a survey in the form of a questionnaire that contained common questions for both the test group and the control group on topics ranging from burning sensation to altered taste. As depicted in fig (5) around 80% of patients from control group (CHX) complained of burning sensation while none of the patients in test group had any such discomfort. Altered taste was also highlighted by 60% patients of control group (CHX) as opposed to only 20% patients of test group (SOP) who basically complained of the oily-bland taste rather than any taste alteration or altered taste. Even where compliance was concerned 80% patients of test group (SOP) showed better compliance as opposed to 60% with the control group patients (CHX). The probable reason could be the once daily format for oil pulling. Finally 60% of patients on Oil pulling –test group were willing to continue the regimen but we cannot advocate the same for Chlorhexidine users-control group.

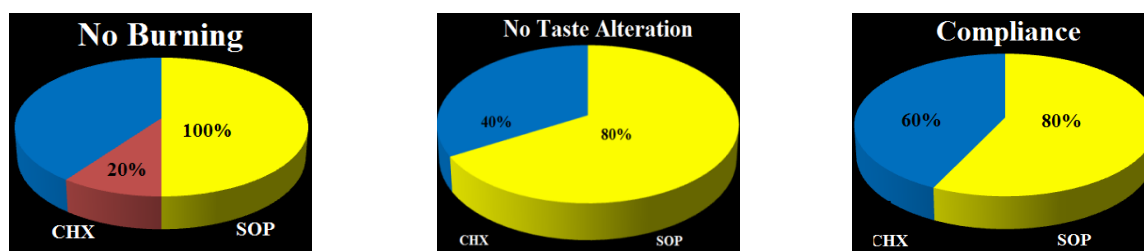


Fig 5: Representation of results of patient acceptance

IV. DISCUSSION:

Oil pulling is a folk remedy which is not widely practised, furthermore it lacks scientific basis. Through this study we can evaluate if oil pulling can be developed as an oral hygiene habit through its effect on plaque, gingivitis and mouth residing bacteria.

The evaluation in this study included both clinical and microbiological assessment as well as patient acceptance survey. Clinical assessment was based on the Plaque Index given by Silness and Loe and Gingival Index given by Loe and Silness. Microbiological assessment aimed at the total colony count of aerobic microorganisms in the pre and post procedural sample of both test and control group. Various oils can be used for performing oil pulling like sesame oil, coconut oil, sunflower oil. We have used sesame oil in this study. In this study, oil pulling therapy has been as equally effective as chlorhexidine against plaque-induced gingivitis. As depicted in Table No (1) For the test group the mean difference in plaque scores showed a reduction of 51.6% as opposed to 47.61% for control group and the mean difference in gingival scores of test group was 53.37% as opposed to 44.58% for the control group. The colony forming units of the test group had reduced and it showed a mean difference of 44.5% while in the control group the showed a reduction of 41.3% compared to the initial scores. Patient acceptance survey revealed that 60% of patients were willing to continue oil pulling as part of their daily oral hygiene regimen.

Amith, Ankola and Nagesh² showed that oil pulling therapy with sunflower oil significantly reduced plaque scores after 45 days. In this study, there was a significant reduction in the plaque index and modified gingival index scores after oil pulling therapy. There was a considerable reduction in the colony count of microorganisms but it was not statistically significant. This could be due to the fact that normal oral flora was also counted and mean values were assessed for the total colony count. Hence, in this study, oil pulling therapy was very effective against plaque-induced gingivitis both in the clinical and microbiological assessment.

Chlorhexidine “The gold standard” mouthwash was used as the control in this study to assess and compare the effect of oil pulling therapy on plaque-induced gingivitis. Axelsson and Lindhe have shown that chlorhexidine mouthwash is effective in the reduction of plaque and gingivitis.³ Menendez and Santos have shown that chlorhexidine is very effective against the formation of dental plaque.^[4,5] Salehi and Momeni Danaie have compared the antibacterial effects of persica mouthwash with the standard chlorhexidine on streptococcus mutans and showed that the chlorhexidine still remained the gold standard.⁶ Arweiler, et al. and Lorenz compared the efficacy of two commercially available chlorhexidine mouthrinses on the development of dental plaque, plaque re-growth, and gingivitis and showed that there was no statistically significant difference between both commercially available mouthrinses with respect to plaque inhibition.^[7,8]

Sesame oil is obtained from the seeds of the plant *Sesamum indicum* (Pedaliaceae family) largely by pressing methods. Sesame oil is relatively high in unsaponifiable substances, which contains sesamin, sesamol and sesamol, not found in other fats. Sesamol is a potent antioxidant, not freely available in the oil and is formed as a result of hydrolysis of sesamol. Sesame oil has increased polyunsaturated fatty acids and the lipid peroxidation is reduced thereby reducing free radical injury to the tissues.^[8-11]

A study conducted by Asokan et al (2008) showed a definitive reduction in *Streptococcus mutans* count in plaque and saliva after oil pulling therapy. So oil pulling therapy has shown to reduce the incidence of dental caries.¹² Another study by Asokan et al (2009) showed that oil pulling therapy was very effective against plaque induced gingivitis both in clinical and microbiological assessment.¹³ Asokan et al (2011) has also demonstrated that the emulsification process of oil started in five minutes after oil-pulling therapy. The emulsification was a result of the agitation of the oil in the mouth because of the swishing process and this process may be responsible for the formation of a soapy layer. The emulsification process could alter the adhesion of the bacteria on the tooth surface, remove the superficial worn-out squamous cells and improve oral hygiene. Thus indicating a possible saponification and emulsification process during oil-pulling therapy, which enhances the cleansing action of the sesame oil during oil-pulling therapy. These mechanisms could have been the reason for the reduction of plaque scores and colony count of the microorganisms in this study.¹⁴

Sesame oil has the following advantages over chlorhexidine: no staining, no lingering after-taste, and no allergy. Sesame oil is 5 to 6 times more cost effective than chlorhexidine and is readily available in most households. There are no disadvantages for oil pulling therapy except for the extended duration of the procedure compared with chlorhexidine. Though oil pulling therapy cannot be used as a treatment adjunct as of now, it can be used as a preventive home therapy to maintain oral hygiene. Extensive studies with larger samples, varying time periods, and long follow-up times should be carried out to establish the efficacy of oil pulling therapy in prevention of plaque-induced gingivitis. More studies with sesame oil can open new doors in the field of research in oral health care.¹⁵

V. CONCLUSION:

Gingivitis when left untreated can progress to a more destructive form of periodontal disease. An effective modality of prevention which can arrest the disease progression and ensure healthy tissues is important. From the results obtained it can be concluded that Oil Pulling has a significant effect on plaque and gingivitis. Hence if practiced daily it can be developed into a healthy oral hygiene habit. Present study being a preliminary intervention has certain limitations like short sample size and short duration of evaluation. Further studies are needed to support Oil Pulling as an adjunct to Scaling and root planing. A household remedy like oil pulling which saves time and money and enhances general health needs exploration. Thus we can promote awareness among people of the long lost practice of oil pulling which is a good preventive home therapy in developing countries like ours.

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