

Merits of Oil Pulling Therapy in the Management of Xerostomia and Stomatopyrosis in Burning Mouth Syndrome

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ABSTRACT

Introduction: Burning Mouth Syndrome (BMS) is a condition which is characterised by xerostomia, stomatopyrosis, dysgeusia and primarily affects the women of perimenopausal age. Despite the plethora of trials that have been going on since decades for management of this condition, there seems to be no definitive cure till date, which is mainly attributed to the ambiguity of this condition. Oil pulling is a simple, ancient technique which can be used as an adjunctive or supplemental therapy in a number of conditions, including BMS.

Aim: To assess the efficacy of oil pulling therapy using sesame oil on xerostomia and stomatopyrosis in patients suffering from primary BMS.

Materials and Methods: This is a prospective study conducted at I.T.S. Dental College, Greater Noida, Uttar Pradesh, India, between

April 2016 to April 2017 and included a total of 25 patients. On the basis of the detailed case history and complete haemogram, patients clinically diagnosed with primary BMS were advised oil pulling therapy once daily for a period of three months and symptoms of xerostomia and stomatopyrosis were assessed at the end of every month using Visual Analog Scale (VAS).

Paired t-test was applied. The level of significance was set at $p < 0.05$. The software used for analysis was SPSS software version 16.0.

Results: All patients showed a statistically significant improvement in symptoms of both xerostomia and stomatopyrosis at the end of three months when compared with the baseline values ($p < 0.05$).

Conclusion: Oil pulling therapy using sesame oil is found to be a simple yet effective modality with no harmful side effects, which can be advised to patients of BMS.

Keywords: Adjunctive therapy, Dry mouth, Oral dysaesthesia, Oral psychosomatic disorders

INTRODUCTION

Burning mouth syndrome is sometimes also referred to as stomatopyrosis, stomatodynia, glossopyrosis, glossodynia, or oral dysaesthesia. However, the term "syndrome" is considered more precise because of the concurrence of other subjective symptoms, including dry mouth (subjective xerostomia), altered taste perception (dysgeusia) and burning sensation of the oral tissues (stomatopyrosis) [1].

BMS is a chronic and exasperating condition, primarily affecting the perimenopausal women, in a ratio of 7:1 when compared to men [2,3]. It may affect any part of the oral cavity; however, the most often affected site is the anterior two-thirds and tip of the tongue [4]. The prevalence of BMS varies from 0.7 to 15% in the general population [5-8].

BMS can be classified into three types, based on the pattern of symptoms. Type 1 is characterised by symptoms which are not present upon waking, but they progress in severity with the day and become most severe in the evening. Type 2 patients suffer with burning symptom when they wake up with and which is present throughout the day. Type 3 patients complain of intermittent symptoms in nonspecific locations [9]. Based on aetiology, BMS can broadly be classified into primary and secondary. Primary BMS is said to be present when there is no aetiology that is associated with the symptoms of the condition. Secondary BMS is a condition wherein an aetiological factor is present that can be attributed to the presence of symptoms of xerostomia, stomatopyrosis and/or dysgeusia [10].

Treatment of BMS is ambiguous and multifaceted. A large number of trials have been done and the best evidence that exists is

regarding the efficacy of topical and systemic clonazepam [11]. Hormone replacement therapy, other medications and therapeutic noninvasive neuromodulation are some of the methods which may be provided for efficient treatment for BMS [11].

However, despite the availability of multitude of treatment options, there is no definitive cure which can be established and usually the patients lose all hope during the course of treatment when they are shunned from one clinician to the other, thereby worsening the condition even further.

In this harrowing condition, oil pulling is one therapy which can turn out to be a boon for these patients. It is a therapy which has been engraved in our ancient Ayurvedic literature, such as Charaka Samhita, where it has been referred to as Kavala or Gandusha. It is a simple therapeutic procedure that can be advised to the patients in which oil is swished in the oral cavity for a particular period of time and then expelled out to achieve health benefits.

The concept of oil pulling technique is not new. Ever since its introduction, it has been used extensively for multiple benefits such as prevention of dental caries, bleeding gums, halitosis, dryness of mouth and throat, cracked lips and for strengthening teeth, gums and jaws [12].

Oil pulling therapy can be carried out with a number of virgin edible oils such as coconut, sunflower or sesame oil. The sesame plant (*Sesamum indicum*) is known to have a number of nutritional qualities and health effects and is considered as a boon by many health practitioners and researchers [13].

The effect of oil pulling has been evaluated on a number of oral conditions; however, this is the first study which determines the effectiveness of this therapy on BMS. The purpose of this study

was to assess the efficacy of oil pulling therapy using sesame oil on symptoms of xerostomia and stomatopyrosis in patients with primary burning mouth syndrome.

MATERIALS AND METHODS

It is a prospective study conducted at I.T.S. Dental College, Greater Noida, Uttar Pradesh, India, between April 2016 to April 2017 with a total of 25 patients. All patients who reported to the Department of Oral Medicine and Radiology with complaints of xerostomia and stomatopyrosis since one month or more and were not undergoing any medication for the symptoms were approached with a patient information sheet. Detailed case history was recorded for all patients and a complete haemogram was done.

The study was approved by the Institutional Ethical Committee and an informed consent was obtained from all the patients.

Inclusion Criteria

Patients with complaints of unexplained burning sensation in the mouth and persistent dryness in the mouth for one month or more were included in the study.

Exclusion Criteria

Patients with any known underlying systemic disease, any mucosal lesion attributing to the symptoms, patients allergic to any content of the oil (enrolled patients to be dropped out in case of any allergy), patients with moderate to severe gag reflex and patients who disagreed to continue with the study after first intraoperative oil pulling (instructional demonstration of the process) were excluded from the study.

Each participant was given sachets of oil on a monthly basis. The sachets of sesame oil were obtained from VV & Sons Edible Oils Ltd., Tamil Nadu. Each patient was recalled on a monthly basis for a total period of three months and improvement in symptoms of xerostomia and stomatopyrosis was evaluated on VAS with the range of values from 0 to 10 [14].

Procedure of Oil Pulling Therapy

Each participant was instructed to consume one sachet with 10 mL oil, once daily, for a period of three months. Patients were told to perform this procedure before brushing teeth in the morning. Patients were given instructions to open the sachet and directly transfer all of its contents into the mouth, keep the oil in the mouth and keep swishing it for 10-15 minutes, without ingesting the oil and to spit the oil after swishing. They were told to not eat or drink anything for at least half an hour after the procedure.

The symptoms of xerostomia and stomatopyrosis were measured on VAS at each visit. The values at the end of three months were compared with the baseline values for all patients.

STATISTICAL ANALYSIS

Paired t-test was applied on the data and the values at the end of every month were compared with the baseline values for each symptom. The confidence interval was set at 95%. The p-value < 0.05 was considered significant and < 0.001 was considered highly significant. The data was analysed using SPSS software version 16.0.

RESULTS

A total of 25 patients participated in the study, out of which 20 (80%) were females and 5 (20%) were males. The mean age of occurrence was 43 years with standard deviation of 5.074.

A comparative analysis was done between the VAS scores of each monthly visit with the baseline values for xerostomia [Table/Fig-1,2]. It was observed that the mean VAS score reduced with each month of therapy. It was observed that the difference between the VAS score at the end of first and second months and at baseline was

	Mean VAS Score	Total number of patients	Standard Deviation	Mean difference (Baseline v/s monthly value)	p-value
Baseline	4.36	25	1.551	-	-
Month 1	3.40	25	1.225	0.960	0.05
Month 2	2.36	25	1.150	2.000	0.03
Month 3	0.84	25	0.850	3.520	<0.001

[Table/Fig-1]: Comparative analysis of monthly visit with baseline values for xerostomia with comparison (p-value) between the baseline value and monthly visits.

	Mean VAS Score	Total number of patients	Standard Deviation	Mean difference (Baseline v/s monthly value)	p-value
Baseline	4.36	25	1.604	-	-
Month 1	4.08	25	1.412	0.280	0.06
Month 2	3.12	25	1.453	1.240	0.04
Month 3	2.00	25	1.291	2.360	0.02

[Table/Fig-2]: Mean difference between baseline values and follow up visits for stomatopyrosis with comparison (p-value) between the baseline value and monthly visits.

statistically significant ($p=0.05$ and 0.03 respectively). The difference at the end of therapy, i.e., three months was statistically highly significant ($p<0.001$).

It was seen in case of stomatopyrosis that the difference in VAS scores at the end of first visit and the baseline values was statistically insignificant ($p=0.06$). However, at the end of second and third months, the difference became statistically significant ($p=0.04$ and 0.02 respectively).

DISCUSSION

The practice of oil pulling therapy is not widely known by the patients and clinicians and its efficacy in burning mouth syndrome lacks substantial amount of clinical research. This is the first study in which the efficacy of oil pulling therapy using sesame oil has been observed and evaluated in symptoms of xerostomia and stomatopyrosis.

However, a number of studies have been done and published on the effects of oil pulling therapy on various other conditions such as plaque formation, halitosis, gingivitis and cariogenic bacteria. All of these studies have talked about the effectiveness and benefits of this therapy with minimal side effects that are usually associated with other conventional therapies [15].

Saravanan D et al., conducted a study on 40 patients to evaluate the efficacy of oil pulling technique using sesame oil on plaque, gingivitis and colony forming bacteria. It was a case control study in which the 40 patients were equally divided and the results were assessed pre and post therapy for 45 days. It was observed that oil pulling therapy using sesame oil resulted in statistically significant decrease in plaque, gingival scores and the number of bacteria in the mouth [16].

Continuous swishing of oil within the oral cavity is known to activate enzymes which "pull" the toxins from the oral cavity. These toxins are expelled from the body as the patient spits the oil. During the process, the oil loses its viscosity and turns milky white. Retained yellow colour of the oil when expelled signifies that the oil has not been pulled enough [12].

The exact mechanisms of oil pulling are not known. It has been proposed that the viscosity of the oil can inhibit bacterial adhesion and plaque coaggregation [17].

Sesame (*S. indicum* L., pedaliaceae) is a very old cultivated crop and thought to have originated in Africa [18]. Chlorosessamone is a compound which is obtained from the roots of sesame and is known to have antifungal activity [19]. Sesame lignans have antioxidant and health enhancing activities [20]. These lignans include sesamin and

sesamol and high amounts of both of these lignans have been identified in sesame [21].

Both sesamin and sesamol have been reported to increase the hepatic mitochondrial activity and the rate of peroxisomal fatty acid oxidation [21]. Sesame seed consumption has also been reported in literature to increase plasma gamma tocopherol and enhanced vitamin E activity which is believed to prevent cancer and heart disease [22].

Sood P et al., compared the efficacy of oil pulling therapy using sesame oil against chlorhexidine and placebo on oral malodour. It was observed that oil pulling with sesame oil resulted in highly statistically significant results against placebo and equal efficacy as chlorhexidine in reducing oral malodor and the microbes causing it [23].

Two suggested mechanisms of oil pulling therapy include saponification and emulsification [24]. Oil, when combined with saliva, is known to undergo alkaline hydrolysis of fat, resulting in soap formation. The resultant oil thus acts as a cleanser, removing microbes and toxins.

Emulsification occurs when large globules of fat, when mixed with saliva and swished in the oral cavity, get dispersed into multiple tiny droplets, covering the mucosal surfaces with a much larger surface area. This mechanism may be associated with reduction of the symptomatic dryness and alleviation the burning sensation of the patient [25].

This is the first study in which the efficacy of oil pulling therapy using sesame oil has been evaluated in BMS. The results of our study are consistent with the above stated studies that have been done on other symptoms and conditions and have proved that the efficacy of oil pulling therapy on xerostomia and stomatopyrosis is statistically significant.

The simplicity of this therapy is what makes it compelling. Patients who are usually distressed because of the prevailing symptoms may find this therapy convincing because of not having the need to buy any expensive or complex products or medicines. No adverse effects have till date been reported to be associated with oil pulling therapy, if performed properly.

LIMITATION

The sample size was limited due to less number of patients with primary BMS. The symptoms of dysgeusia were not evaluated due to unavailability of superior methods than VAS such as electrogoniometry.

CONCLUSION

In this study, oil pulling therapy has proved to be an effective modality for management of xerostomia and stomatopyrosis in patients with primary BMS. These patients are usually psychologically distressed

due to the persistent discomfort in the mouth and a simple therapy like oil pulling therapy can work wonders on such patients. However, further research is required to ascertain this therapy as a mainstay treatment modality for the condition. Also, research needs to be done on the symptom of dysgeusia in BMS patients.

REFERENCES

- [1] Nakazono PA, Nogueira AV, de Alencar Júnior FG, Massucato EM. Burning mouth syndrome: a discussion about possible aetiological factors and treatment modalities. *Braz J Oral Sci.* 2015;8(2):62-66.
- [2] Tourne LPM, Friction JR. Burning Mouth Syndrome. *Critical review and proposed clinical management. Oral Surg Oral Med Oral Pathol.* 1992;74:158-67.
- [3] Cavalcanti DR, Birman EG, Migliari DA, Silveira FRX. Burning mouth syndrome: clinical profile of Brazilian patients and oral carriage of *Candida* species. *Braz Dent J.* 2007;18:341-45.
- [4] Evans RW, Drage LA. Burning mouth syndrome. *Headache.* 2005;45:1079-81.
- [5] Bergdahl M, Bergdahl J. Burning Mouth Syndrome: prevalence and associated factors. *J Oral Pathol Med.* 1999;28:350-54.
- [6] Savage NW, Vucicevic-Boras V, Barker K. Burning mouth syndrome: clinical presentation, diagnosis and treatment. *Austr J Dermatol.* 2006;47:77-85.
- [7] Lipton JA, Ship JA, Larach-Robinson D. Estimated prevalence and distribution of reports orofacial pain in the United States. *J Am Dent Assoc.* 1993;124:115-21.
- [8] Tammiala-Salonen T, Hiidenkari K, Parvonen T. Burning mouth in a Finnish adult population. *Community Dent Oral Epidemiol.* 1993;21:67-71.
- [9] Abetz LM, Savage NW. Burning mouth syndrome and psychological disorders. *Aust Dent J.* 2009;54(2):84-93.
- [10] Sunil A, Mukunda A, Gonsalves MN, Basheer AB, Deepthi K. An overview of burning mouth syndrome. *Indian Journal of Clinical Practice.* 2012;23(3):145-52.
- [11] Jääskeläinen SK, Woda A. Burning mouth syndrome. *Cephalalgia.* 2017;37(7):627-47.
- [12] Tomar P, Hongal S, Jain M, Rana K, Saxena V. Oil pulling and oral health: a review. *IJSS Case Reports & Reviews.* 2014;3:33-37.
- [13] Asokan S. Oil pulling therapy. *Indian J Dent Res.* 2008; 19(2):169.
- [14] Haefeli M, Effering A. Pain assessment. *Eur Spine J.* 2006;15(1):S17-S24.
- [15] Shanbhag VK. Oil pulling for maintaining oral hygiene—A review. *J of Tit Complement Med.* 2017;7(1):106-09.
- [16] Saravanan D, Ramkumar S, Vineetha K. Effect of oil pulling with sesame oil on plaque-induced gingivitis: a microbiological study. *J Orofac Res.* 2013;3(3):175.
- [17] Asokan S, Rathana J, Muthu MS, Rathana PV, Emmadi P, et al. Effect of oil pulling on *Streptococcus mutans* count in plaque and saliva using Dentocult SM Strip mutans test: A randomized, controlled, triple-blind study. *J Indian Soc Pedod Prev Dent.* 2008;26(1):12.
- [18] Ram R, Catlin D, Romero J, Cowley C. Sesame: New approaches for crop improvement. *Advances in new crops.* Timber Press, Portland. 1990:225-28.
- [19] Hasan AF, Begum S, Furumoto T, Fukui H. A new chlorinated red naphthoquinone from roots of *Sesamum indicum*. *Biosci Biotechnol Biochem.* 2000;64:873-74.
- [20] Kato MJ, Chu A, Davin LB, Lewis NG. Biosynthesis of antioxidant lignans in *Sesamum indicum* seeds. *Phytochemistry.* 1998;47:583-91.
- [21] Sirato-Yasumoto S, Katsuta M, Okuyama Y, Takahashi Y, Ide T. Effect of sesame seeds rich in sesamin and sesamol on fatty acid oxidation in rat liver. *J Agric Food Chem.* 2001;49(5):2647-51.
- [22] Cooney RV, Custer LJ, Okinaka L, Franke AA. Effects of dietary sesame seeds on plasma tocopherol levels. *Nutri and Cancer.* 2001;39(1):66-71.
- [23] Sood P, Devi A, Narang R. Comparative efficacy of oil pulling and chlorhexidine on oral malodor: A randomized controlled trial. *J Clin Diagn Res.* 2014;8(11):ZC18.
- [24] Hebbar A, Keluskar V, Shetti A. Oil pulling—Unraveling the path to mystic cure. *J Int Oral Health.* 2010;2(4):11-15.
- [25] Asokan S, Rathinasamy TK, Inbamani N, Menon T, Kumar SS, Emmadi P, et al. Mechanism of oil-pulling therapy-in vitro study. *Indian J Dent Res.* 2011;22(1):34.

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FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: **May 26, 2017**

Date of Peer Review: **Aug 25, 2017**

Date of Acceptance: **Oct 12, 2017**

Date of Publishing: **Dec 01, 2017**