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Topical Sesame Seed and Pumpkin Seed Oils have Therapeutic and Prophylactic Role in the Management of Recurrent Aphthous Stomatitis

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Abstract **Background:** Recurrent aphthous stomatitis (RAS) is a major oral health problem, where its etiopathogenesis is not well understood. Accordingly, its therapy whether topical or systemic can induce clearance, but the relapse rate is high. **Objective:** To evaluate the efficacy and prophylactic effects of topical Sesame seed oil in comparison with Pumpkin seed oil in the management of recurrent aphthous stomatitis. **Patients and Methods:** This is a single, blinded, clinical, therapeutic, comparative study where 45 patients with early onset RAS were recruited in Center of Dermatology -Baghdad Teaching Hospital, Baghdad, Iraq from April 2018-October 2019. Full history and clinical examination were done for each patient and patients were divided into 2 groups: Group A (20 patients) used crude Sesame seed oil twice daily. Group B (25 patients) was instructed to use Pumpkin seed oil in a similar way to Group A. Short term assessment of each patient of both groups was done to evaluate the therapeutic effect of drug by using oral clinical manifestation index (OCMI). A long term assessment was done for each patient to evaluate the prophylactic effect of drug by using OCMI before, after 1, 2 and 3 months of therapy. **Results:** The patients enrolled in this study were 30 males (66.6%) and 15 females (33.3%), with male to female ratio were 2:1. Their ages ranged between 9-60 (36.33 ± 11.06) years. The mean of OCMI in Group A started to decline directly after 4 days of therapy and went to its lower level after 8 days of therapy, and it was statistically significant (P value <0.05). The change in the mean of OCMI of Group B after 8 days of therapy was also statistically significant (P value <0.05). The difference in the response rates after 4 and 8 days between Group A and B was statistically not significant (P value >0.05). Both groups showed statistically significant prophylactic effect after 1, 2 and 3 months from starting therapy. No significant side effects were noticed in both groups as both oils are edible oils. **Conclusion:** Sesame and pumpkin seed oils had a statistically significant effective therapeutic and prophylactic action against RAS. No local or systemic side effects were observed during the course of therapy. These two edible oils will give new hope for management of these chronic recurrent oral ulcers.

Keywords Sesame seed oil, Pumpkin seed oil, Edible oils, Recurrent aphthous stomatitis

1. Introduction

Recurrent aphthous stomatitis (RAS) is one of most common cause of oral ulceration that associated with a major health problem as it affects at least 20% of population all over the world [1]. There are many varieties of RAS like minor, major and herpetiform. Minor ulcers (80%) are less than one centimeter in diameter; usually heal within 2 weeks without scarring. Major ulcers (10%) usually one centimeter or more in diameter, take 10 - 40 days to heal and may leave scars, while herpetiform ulcers (10%) are cluster of dozens of smaller ulcers [2]. There are many theories that have been suggested to explain its etiopathogenesis but the proper cause is still not fully explained [3].

The prognosis of this disease could not be predicted, still some patients might get remission either as a result of therapy or spontaneously [4]. A large number of therapies both topical and systemic have been used in treatment of RAS, including topical, intralesional and oral steroid [3], tetracycline, [5] topical honey, [6] lactic acid 5% mouthwash, [7,8] BCG vaccine, [9] nigella sativa oil, [10] oral dapsone and oral zinc sulfate, [11] oral colchicine, [12] oral isotretinoin, [13] oral thalidomide, [14] oral clofazmine [15] and others.

Recently, an Iraqi study showed that Pumpkin seed oil has an effective therapeutic and prophylactic effect in management of RAS, as Pumpkin seed oil is rich source of

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vitamins, minerals and antioxidants, in addition it has good anti-inflammatory action. [16]

Sesame oil contains Sesamin (0.4-1.1%), sesamolin (0.3-0.6%) and traces of sesamol that contribute to the unique therapeutic properties of sesame oil. [17] In addition, sesame contains ample amounts of oleic, linoleic, palmitic and stearic acid which together comprise 96% of the total fatty acids. [18]

Sesame oil and its lignan sesamol had shown to have potent anti-inflammatory agents as they have an excellent protective effect against endotoxin-associated inflammatory damage because they inhibit the release of inflammatory mediators. Sesamol also inhibits endotoxins from binding to its receptor; thus reduces inflammatory transcription factor NF-κB activation. [19] Sesame oil has also a high content of unsaturated fatty acids (palmitic, stearic, oleic and linoleic acids), well as well presence of lignans (sesamin, asarinin, sesamolin, and sesamol) and gamma-tocopherol. All these compounds may be responsible for the pharmacological activities, since several studies have demonstrated that fatty acids reduce the levels of prostaglandins and leukotrienes. [20] Vitamin E, a fat soluble antioxidant, protects the body from harmful oxidizing compounds. Sesame seed oil contains gamma tocopherols along with sesaminol and sesamin which possesses Vitamin E like activity. [21]

So, the aim of the present work is to evaluate the efficacy and prophylactic actions of topical Sesame seed oil in comparison with Pumpkin seed oil in the management of RAS.

2. Patients and Methods

This is a single blind therapeutic comparative study to evaluate the effectiveness of topical Sesame seed oil in treatment and prophylaxis of RAS in comparison with Pumpkin seed oil. Patients with RAS enrolled in this study were those who attended Baghdad Teaching Hospital - Centre of Dermatology in the period between March 2018 and December 2019.

Inclusion criteria: Patients with RAS in the present work were those with early onset ulceration (less than 3 days duration) and had little or no benefit obtained from other conventional therapy in previous attacks. Also they stopped their treatment at least two months before the present therapy. The diagnosis of RAS was based on history and clinical examination. History was obtained regarding age, gender, occupation, past medical history, drug history, smoking and alcohol intake, the recurrence rate and history of the same condition or other illness in the family. Also, they were asked about any aggravating factors including food, stress and trauma or associated symptoms. All patients were fully examined regarding shape, size and number of the lesions. Investigations were done for all patients regarding pathergy test, complete blood picture, ESR and HLA-B51 to exclude patients with Behcet's disease and other internal causes of oral ulcerations. All patients were seen by ophthalmologists, Neurologist and Rheumatologist whenever needed to exclude findings suggestive for Behcet's disease. Formal consent was taken from each patient and/or their parents before starting the trial after a full explanation for the nature of the disease, causes, prognosis, the drug, the method of treatment, duration of follow up and the possible side effects. The ethical approval was granted from the Scientific Committee of the Scientific Council of Dermatology, Iraqi Board for Medical Specializations.

Forty five patients with early onset oral ulcerations were enrolled in this study. The patients were divided into two groups:-

Group A: on topical Sesame seed oil and **Group B:** on topical Pumpkin seed oil.

Drug preparation: Both oils were ready made in Iraq-Mosul Factory, EMAD trade mark, kept in a clean and tight container till usage. Patients instructed to use both seeds oils topically using cotton piece and applied to the entire oral mucosa two times daily for 3 months. All patients instructed not take any other drug for their apthous ulcer during the course of the study, and to return if they developed drug side effects. An oral clinical manifestations index (OCMI) [16]. Table (1), for each patient was calculated before and during the therapy to assess the response to treatment.

Table (1). Oral clinical manifestation index

Type	Type Scoring
Minor ulcer	1
Herpetiform ulcer	2
Major ulcer	3
Number of ulcers/ attack	
1 – 3	1
4 – 6	2
7 – 9	3
9 – 12	4
More than 12	5
Duration of the attack	
1 – 4 days	1
5 – 8 days	2
9 – 12 days	3
More than 12 days	4
Frequency (attack/ date)	
0 – 2 weeks	5
3 – 4 weeks	4
5 – 6 weeks	3
7 – 8 weeks	2
More than 8 weeks	1
Associated symptoms	
Uncomfortable	1
Painful , but not interfere with eating or Swallowing	2
Interfere with solid feeding	3
Interfere with liquid feeding	4

Follow up:

Short term assessment (The therapeutic effect of drugs): An assessment was performed for each patient on day 4 and 8 from starting therapy using OCMI. Also, the size of each oral ulcer was recorded before starting therapy and on day 4 and 8 after starting therapy, then mean size of ulcers was calculated for each patient on each visit. The size of ulcer was measured depending on the largest diameter of the ulcer.

Long term assessment: The OCMI score was recalculated monthly for 3 months after starting the therapy to evaluate the prophylactic efficacy of both therapies and to record any local or systemic side effects.

Statistical analysis: The data were analyzed, and the paired t-test was used to compare the means of OCMI before, after 4 days and after 8 days of therapy of both groups. The response rate was estimated by calculating the percentage of change in the means of OCMI after 4 and 8 days of treatment from the baseline of mean of OCMI before treatment. Also paired t- test was used to compare the response rates after 4 and 8 days of therapy between the two groups included in this study. P-value of less than 0.05 was considered to be statistically significant.

ANOVA test was used to compare the mean of OCMI, the mean size of ulcer and symptoms after treatment between these two groups. The data analysis was done using Statistical Package for Social Sciences (SPSS) version 24.

3. Results

Forty five patients were enrolled in this study; 30 males (66.6%) and 15 females (33.3%), with male to female ratio was 2: 1. Their ages ranged between 9-60 years with a mean ± SD of 36.33 ± 11.06 years. All investigations for all patients were negative.

The therapeutic effect of drugs:

► The effect on OCMI scores:

Group A (Sesame seed oil): In this group (20 patients), 12 males and 8 females; their ages ranged between 12-60 years with a mean ± SD of 37.75 ± 11.97 years. The OCMI before therapy ranged from 7–16 with a mean ± SD of 12.7 ± 3.6. The mean started to decline significantly to a lower level within 4 days of treatment to be 3.9 ± 2.45. While after 8 days of treatment a significant lower level of data was recorded, the mean was: 0.8 ± 1.2 with a $P < 0.001$ which was statistically highly significant (Table-2).

Group B (Pumpkin seed oil): In this group (25 patients), 18 males and 7 females; their ages ranged between 9-60 years with mean ± SD of 27.48 ± 11.97 years, the OCMI before therapy ranged between 7 and 16 with a mean ± SD 12.4 ± 3.7, the mean started to decline significantly to a lower level within 4 days of treatment to be 3.2 ± 2.2. While after 8 days of treatment a significant lower level of data was recorded, the mean was 1.8 ± 1.2 with a $P < 0.05$ which was statistically significant (Table-2).

The difference in response rate between both groups was statistically not significant ($p = 0.578$) at 4 days of treatment, and after 8 days of therapy ($p = 0.549$) (Table-3).

► The effect on mean size of ulcers:

Group A (Sesame seed oil): The mean size of oral aphthous ulcers in this group before therapy ranged between 5-10 mm with a mean ± SD of 8.33 ± 1.91 mm, the mean started to decline significantly to a lower level within 4 days of therapy to be 3.06 ± 3.11 and continued to decline till the 8th day of the course of therapy to be 0.36 ± 0.66 with a $P < 0.05$ (Table-4).

Group B (Pumpkin seed oil): The mean size of oral aphthous ulcers in this group before therapy ranged between 3-10 mm with a mean ±SD of 6.20 ± 2.67 mm, the mean started to decline significantly to a lower level within 4 days of therapy to be 3.72 ± 2.33 and continued to decline till the 8th day of the course of therapy to be 0.80 ± 0.85 with a $P < 0.05$ (Table-4).

The difference in response rate between both groups in size of ulcer at day 4 and day 8 was statistically not significant ($p = 0.335$), ($p = 0.132$). (Table-5).

Table 2. The effect of Sesame oil and Pumpkin oil on OCMI of the ulcers

		Sesame oil			**Pumpkin oil**	
	Range	Mean	SD	Range	Mean	SD
At day 0	7 – 16	12.7667	3.62637	7 - 16	12.4500	3.70305
At day 4	0 – 6	3.9667	2.45628	0 - 6	3.2500	2.23678
At day 8	0 – 4	.8000	1.29721	0 - 4	1.8000	1.22546
P value	**P=0.000 P<0.001 HS**			**P=0.002 P<0.05 Significant**		

Table 3. The significance of response rates on OCMI between both groups

Sesame oil % vs Pumpkin oil %	**P-value**	**Sig**
Difference in score 0 & 4	0.383	NS*
Difference in score 0 & 8	0.578	NS*
Difference in score 4 & 8	0.549	NS

*P>0.05 Non significant

Table 4. The effect of Sesame oil and Pumpkin oil on size of ulcers

	Sesame oil			Pumpkin oil		
Mean size of Ulcer	Range	Mean	SD	Range	Mean	SD
At day 0	5 - 10 mm	8.3333	1.91785	5 - 10 mm	8.0500	1.93241
At day 4	0 - 8 mm	3.0667	3.11762	0 -8 mm	3.7200	2.33053
At day 8	0 – 2mm	0.3667	0.66868	0 – 2mm	0.8000	0.85145
P value	P=0.001 P<0.05 Significant			P=0.008 P<0.05 Significant		

Table 5. The significance of response rates size of ulcers between both groups

Sesame oil % vs Pumpkin oil %	Sesame oil %	P-value	Sig
Difference in score 0 & 4	At day 0	0.998	NS
Difference in score 0 & 8	At day 4	0.335	NS
Difference in score 4 & 8	At day 8	0.132	NS

*P<0.05 Significant

Table 6. The prophylactic effect of Sesame oil and Pumpkin oil on OCMI scores during course of therapy

	Sesame oil			Pumpkin oil		
OCMI score	Range	Mean	SD	Range	Mean	SD
At day 0	7 - 16	12.7667	3.62637	7 - 16	13.4500	3.10305
At month 1	0 - 10	2.9667	3.16754	0 - 10	2.7500	3.85084
At month 2	0 - 8	2.6333	2.65854	0 - 13	4.3500	5.44131
At month 3	0 - 8	3.4333	2.64814	0 - 13	5.8000	5.09489
P value	P=0.000 P<0.001 Significant			P=0.006 P<0.05 Significant		

The prophylactic effect of drugs:

Both groups showed statistically significant effect on the OCMI of ulcers after 1, 2 and 3 months from starting therapy (P = 0.004 P < 0.05) (Table-6).

In addition, using the independent t test, both seeds oils showed statistically significant prophylactic effect with non-significant difference between both groups after 1, 2 & 3 months from starting therapy (Table-7)

Table 7. The significance of prophylactic effect on OCMI score between Sesame oil & Pumpkin oil

OCMI score	P-value	Sig
At day 0	0.383	NS
At month 1	0.173	NS
At month 2	0.331	NS
At month 3	0.223	NS

4. Discussion

Despite numerous clinical trials, no medication gives completely reliable cure [4]. A large number of therapies both topical and systemic have been used in treatment of RAS, including topical, intralesional and oral steroid [3], tetracycline, [5] topical honey, [6] lactic acid 5% mouthwash, [7,8] BCG vaccine, [9] nigella sativa oil, [10] oral dapsone and oral zinc sulfate, [11] oral colchicine, [12] oral isotretinoin, [13] oral thalidomide, [14] oral clofazmine [15] and others. Recently, an Iraqi study showed that Pumpkin seed oil has an effective therapeutic and prophylactic effect in management of RAS, as pumpkin seed oil are good source of vitamins, minerals and anti-oxidants, so it has many pharmacological actions like antimicromial, antioxidant and anti-inflammatory effects. [16]

This study encouraged us to perform the present work using sesame seed oil to be compared with pumpkin seed oil in management of RAS.

Sesame oil contains Sesamin (0.4-1.1%), sesamolin (0.3-0.6%) and traces of sesamol contribute to the unique properties of sesame oil. [17] Also sesame contains ample amounts of oleic, linoleic, palmitic and stearic acid which together comprise 96% of the total fatty acids. [18] These active ingredients have many pharmacological actions mainly anti-inflammatory [18,19] antioxidants [20,21] effects. The results of the present work showed that both therapies are effective as therapeutic and prophylactic agents in controlling RAS.

The effect of both therapies on OCMI was statistically significant after 4 and 8 days of therapy and remained statistically significant throughout the three months course of therapy.

Sesame seed oil was slightly better than Pumpkin seed oil especially at day8 of therapy and remained better at 2 and 3 months of prophylactic course.

No local or systemic side effects were noticed because both oils are edible food.

The mechanism of action of sesame seed oil in treatment of RAS cannot be clearly explained, but probable mechanisms of action may be through its anti-inflammatory, [18,19] and antioxidant actions [20,21] which are

comparable to actions of pumpkin oil.

So in conclusion Sesame seed oil is a safe and effective therapeutic and prophylactic agent in management of RAS and its action was comparable to the effects of pumpkin oil.

REFERENCES

[1] Jurge S, Kuffer R, Scully C, Porter SR. Number VI recurrent aphthous stomatitis. Oral diseases. 2006 Jan; 12(1): 1-21.

[2] Riera Matute G, Riera Alonso E. Recurrent aphthous stomatitis in Rheumatology. Reumatol Clin. 2011; 7(5): 323-8.

[3] Andrews's diseases of the skin, Clinical dermatology. Belenguer I, Chaven M, Scully C. Philadelphia. WB Saunders Company. 12th ed. 2016; 34: 803-12.

[4] Compilato DO, Carroccio AN, Calvino FR, Di Fede G, Campisi G. Haematological deficiencies in patients with recurrent aphthosis. Journal of the European Academy of Dermatology and Venereology. 2010 Jun; 24(6): 667-73.

[5] Baccaglini L, Lalla RV, Bruce AJ, Sartori-Valinotti JC, Latortue MC, Carrozzo M. Urban legends: recurrent aphthous stomatitis. Oral Dis. 2011; 17: 755–70.

[6] Sharquie KE, Najim RA. Honey as a new skin tissue preservative. J. Pan-Arab League Dermatol. 2001; 12: 49-54.

[7] Sharquie KE, Al-Tammimy SM, Al-Mashhadani S, Hayani RK, Al-Nuaimy AA. Lactic acid 5 percent mouthwash is an effective mode of therapy in treatment of recurrent aphthous ulcerations. Dermatology online journal. 2006; 12(7).

[8] Sharquie KE, Al Mashhadani SA, Noaimi AA, Al-Hayani RK, Shubber SA. Lactic Acid 5% Mouthwash is an Effective Therapeutic and Prophylactic Agent in Treatment of Recurrent Aphthous Ulcer (Single blind placebo controlled therapeutic study. Iraqi Academic Scientific Journal. 2012; 11(3): 363-9.

[9] Sharquie KE, Hayani RK. BCG as a new therapeutic and prophylactic agent in patients with severe oral aphthosis. Clinical and experimental rheumatology. 2005; 23(6): 914.

[10] Sharquie KE, Al-Mashhaddani, Al-Nuaimy AA, Shubber SA. The Therapeutic and Prophylactic Efficacy of 5% lactic acid, 5% zinc sulphate mouth wash and Topical 100% Nigella Sativa Oil in Management of Recurrent Aphthous Ulcers. Thesis submitted to Iraqi Board for Medical Specializations in Dermatology and Venereology. 2006.

[11] Sharquie KE, Najim RA, Al-Hayani RK, Al-Nuaimy AA, Maroof DM. The therapeutic and prophylactic role of oral zinc sulfate in management of recurrent aphthous stomatitis (RAS) in comparison with dapsone. Saudi Medical Journal. 2008 May 1; 29(5): 734.

[12] Altenburg A, Zouboulis CC. Current concepts in the treatment of recurrent aphthous stomatitis. Skin Therapy Lett. 2008; 13(7): 1–4.

[13] Sharquie KE, Helmi RM, Noaimi AA, Kadhom MA, Al-Hayani RK. Therapeutic Role of Isotretinoin in the Management of Recurrent Aphthous Stomatitis (Single-Blind Controlled Therapeutic Study). Journal of Cosmetics, Dermatological Sciences and Applications. 2015 Feb 4; 5(01): 15.

[14] Aphthous Stomatitis. Mirowski G W and Nebesio C L. http://www.emedicine.com. Sep. 2004.

[15] De Abreu MA, Hirata CH, Pimentel DR, Weckx LL. Treatment of recurrent aphthous stomatitis with clofazimine. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2009; 108: 714–21.

[16] Sharquie KE, Noaimi AA, Latif T. Treatment of Recurrent Aphthous Stomatitis by 100% Topical Pumpkin Seed Oil. Journal of Cosmetics, Dermatological Sciences and Applications. 2017 Nov 9; 7(04): 324.

[17] Kumar CM, Singh SA. Bioactive lignans from sesame (Sesamum indicum L.): evaluation of their antioxidant and antibacterial effects for food applications. Journal of food science and technology. 2015 May 1; 52(5): 2934-41.

[18] Saydut A, Duz MZ, Kaya C, Kafadar AB, Hamamci C. Transesterified sesame (Sesamum indicum L.) seed oil as a biodiesel fuel. Bioresource Technology. 2008 Sep 1; 99(14): 6656-60.

[19] Hsu DZ, Chu PY, Liu MY. Sesame seed (Sesamum indicum L.) extracts and their anti-inflammatory effect. In Emerging Trends in Dietary Components for Preventing and Combating Disease. American Chemical Society; 2012 (335-341).

[20] Monteiro É, Chibli L, Yamamoto C, Pereira M, Vilela F, Rodarte M, de Oliveira Pinto M, da Penha Henriques do Amaral M, Silvério M, de Matos Araújo A, da Luz André de Araújo A. Antinociceptive and anti-inflammatory activities of the sesame oil and sesamin. Nutrients. 2014; 6(5): 1931-44.

[21] Nagendra Prasad MN, Sanjay KR, Prasad DS, Vijay N, Kothari R, Nanjunda Swamy S. A review on nutritional and nutraceutical properties of sesame. J Nutr Food Sci. 2012; 2(127): 2.

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