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## ORIGINAL ARTICLE

# Pure Sesame Oil Versus Isotonic Sodium Chloride Solution as Treatment for Dry Nasal Mucosa

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### Abstract

**Background:** Topical application of sesame oil in cases of nasal dryness, nasal stuffiness, and nasal crusts was highly effective and safe with little or no side effects.

**Aim:** The aim of this work was to evaluate and compare pure sesame oil with isotonic sodium chloride solution (ISCS) in patients with dry nasal mucosa, nasal crusts, and nasal stuffiness.

**Patients and methods:** This research included 60 patients who visited Al-Azhar University Hospitals' otorhinolaryngology (ORL) outpatient clinics (Al-Husseini and Sayed Galal). All patients had a complaint of mucosal dryness, crusting, or stuffiness. Half of the participants were randomly assigned to receive just pure sesame oil for 14 days, whereas the other received ISCS. Visual analog scale was utilized to evaluate the patients' complaints before and after therapy. The findings were compared between endoscopically and questionnaire. Following a 14-day treatment period, the individuals were asked to rate their overall perceptions of the three symptoms: (a) nasal mucosa dryness, (b) nasal crusts, and (c) nasal stuffiness.

**Results:** This study had 60 patients, with a mean age of 34 and a sex ratio of 24 (40 %) females and 36 (60 %) males ranging in age from 18 to 60 years. Regarding mucosal dryness, nasal crusts, and nasal stuffiness, group I patients showed statistically significant changes between pretreatment and posttreatment ( $P = 0.001, 0.02, \text{ and } 0.004$ , respectively). Regarding nasal mucosa dryness, nasal crusts, and nasal stuffiness, statistically significant differences between group I and group II patients were found ( $P = 0.03, 0.02 \text{ and } 0.01$ , correspondingly).

**Conclusion:** Pure sesame oil is superior to ISCS in relieving symptoms of dry nose due to various causes.

**Keywords:** Pure sesame oil, Isotonic sodium chloride solution, Dry nose, Atrophic rhinitis

## 1. Introduction

Despite the fact that many individuals experience nasal dryness, there is no clear definition of dry nose. When the mucous membranes do not have enough moisture, a dry nose results. In addition to the purely subjective experience of a dry nose, other symptoms include stuffiness, pain, nasal blockage, nose bleeds, change or shift in scent, and apparent crusting of the inner nose.<sup>1</sup>

Your throat and lips can get dry when your nasal passages are drier than normal. The tissues in your nose become inflamed, clogged, and irritating when it becomes too dry, and this may cause sinus and nasal infections that can be brought on by either a virus or a bacterium.<sup>2</sup>

It was known 2500 years ago that individuals might have issues with their noses, including inflammation and dryness. The greatest remedy, according to the same source, was to trickle sesame oil into the patient's nostrils.<sup>2</sup>

Sesame oil was recognized by the Indian physician Susruta as a general treatment for a variety of nose issues, and this approach has been around for many centuries. Sesame oil has been advocated in contemporary literature as a remedy for atrophic nasal mucous membranes.<sup>3</sup>

The 1999–2000 version of the Swedish medicine information book advises using sesame oil to treat rhinitis anterior sicca.<sup>4</sup>

The aim of this work was to evaluate and compare pure sesame oil with isotonic sodium chloride

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solution (ISCS) in patients with dry nasal mucosa, nasal crusts, and nasal stuffiness.

## 2. Patients and methods

This is a prospective randomized study. This study examined 60 patients, 24 (40 %) female and 36 (60 %) male ranging in age from 18 to 60 years who were presented at Al-Azhar University Hospitals Otorhinolaryngology (ORL) outpatients (Al-Hussein and Sayed Galal). All patients were diagnosed having nasal mucosa dryness, crustation, or stuffiness due to various causes. We excluded URTI patients (common cold and acute sinusitis). Detailed history was taken including personal history: name, age, sex, residence, employment, marital status, and medically significant habits. Main complaint: nasal mucosal dryness (itching, irritation, burning, and discomfort), nasal crusts, and stuffiness (congestion and edema). Current illness: onset, course, and duration. Past history of nasal surgery, head and neck surgery, trauma, drugs, radiation, and chronic sickness such as TB or Sjogren's syndrome.

### 2.1. General examination

Vital signs, head and neck, and chest were examined. Full ENT examination, endoscopic examination, radiological examination, and laboratory examination when indicated to find the cause of dry nose.

Patients were treated to the following.

Each group received one form of therapy and the outcomes were compared endoscopically and by questionnaire.<sup>5</sup> Every evening, participants assessed effectiveness utilizing visual analog scale; after 14 days, patients answered questions concerning overall symptoms and adverse events.

Half of those randomized received pure sesame oil for 14 days.

We used cold-pressed sesame oil, which was made by crushing sesame seeds under great pressure in an expeller, which created a lot of friction and heats the oil naturally (below 48 °C) to retain its quality and nutrients. It is lighter, absorbs quickly, smells better than roasted sesame oil, and has a long shelf life. We loaded 30 spray bottles with sesame oil. Patients were told to prime pump until stream emerges. Patients received two sprays in each nostril three times daily. Before applying the spray, it should be sprayed on a tissue paper. The thick oil requires 5 s between sprays.

Fourteen-day isotonic sodium chloride solution was used for the other half.

We filled 30 spray bottles with 1000 ml of pharmacy bought NaCl 0.9 %. Both groups' questionnaire and treatment data were collected and statistically examined.

### 2.2. Ethical consideration

We told our patients about the trial, all patients provided written informed consent and we received the ethics committee's approval.

This research was approved by ethical committee of Faculty of Medicine, Al-Azhar University.

Ethical approval number: 0000063.

### 2.3. Statistical analysis

IBM SPSS statistics (Statistical Package for Social Sciences) software version 11.0, IBM Corp., Chicago, USA, version 11 will organize, tabulate, and analyze results. Quantitative data will include a mean, SD, and Student *t*-test to compare means. Qualitative data will have a number and percent distribution. When  $\chi^2$  fails, Fisher exact will be employed, and significance will be set to *P* value less than 0.05.

## 3. Results

After comparison between two studied groups regarding data we found out that group (I) cases (sesame oil) were statistically significant than group (II) cases (Isotonic sodium chloride solution) as regards to Mucosal Dryness, Nasal Crusts and Nasal stuffiness (Tables 1–5).

## 4. Discussion

The nose's primary functions include warming and moistening the air that is inspired and recovering moisture from the exhaled air. For this air-conditioning characteristic, the way air flows into and out of the nasal cavity is crucially important.

Table 1. Among 60 patients, 24 (40 %) female and 36 (60 %) male ranging in age from 18 to 60 years with mean 34 with nasal mucosa dryness.

Demographic data	Group I (N = 30) [n (%)]	Group II (N = 30) [n (%)]	<i>P</i>
Sex			
Male	16 (53.3)	20 (66.7)	0.292
Female	14 (46.7)	10 (33.3)	
Age (years)			
Minimum–maximum	19.0–59.0	19.0–56.0	0.740
Mean ± SD	36.47 ± 11.69	35.53 ± 9.92	
Median (IQR)	34.0 (28–44)	36.50 (27–41)	

IQR, interquartile range.

Table 2. Causes among both studied groups.

Causes	Group I (N = 30) [n (%)]	Group II (N = 30) [n (%)]	P
Smoking	14 (46.7)	10 (33.3)	0.292
Nasal surgery	6 (20.0)	7 (23.3)	0.754
Environmental factors	4 (13.3)	6 (20.0)	0.488
Atrophic rhinitis	3 (10.0)	2 (6.7)	1.000
Side effects of medication	2 (6.7)	3 (10.0)	1.000
Old age	1 (3.3)	2 (6.7)	1.000

Table 3. There were statistically significant differences detected between pretreatment and posttreatment among group I cases as regards to mucosal dryness, nasal crusts, and nasal stuffiness (P = 0001, 0.02, and 0.004, respectively).

	Pretreatment (N = 30) [n (%)]	Posttreatment (N = 30) [n (%)]	P
Nasal mucosa dryness	16 (53.3)	2 (6.7)	0.001
Nasal crusts	7 (23.3)	1 (3.3)	0.02
Nasal stuffiness	7 (23.3)	0	0.004
		100.0	

The maximum distribution of the inspired air are the nasal turbinates while ensuring intimate contact of the air with the surface moist mucosal membrane is essential.<sup>1</sup> Nasal dryness is caused by disturbance with the nose's ability to moist itself, which causes a variety of symptoms such as itchiness, burning, pain, crusts, and stuffiness. Nasal dryness is mostly caused by low humidity, which occurs in conditions such as cold, dry weather, air-conditioned spaces, and long airplane flights.<sup>4</sup>

Proetz and McMahon,<sup>6</sup> observed that nasal dryness occurred when the absolute humidity fell below 5 g H<sub>2</sub>O of water per cubic meter of air (g/m<sup>3</sup>). He was the first to report that 'with approaching winter, there was a wave of dry-nose patients appearing in the office.' The Scandinavian region has a low humidity during winter with many cases had problems with dry nose and throat. Lindwall,<sup>7</sup> in the north of Sweden found that the absolute humidity was below 5 g/m<sup>3</sup> from December to May leading to increased cases of nasal dryness during this period.

Table 4. There were statistically nonsignificant differences detected between pretreatment and posttreatment among group II cases as regards to mucosal dryness, nasal crusts, and nasal stuffiness (P = 0.274, 0.390 and 0.347, respectively).

	Pretreatment (N = 30) [n (%)]	Posttreatment (N = 30) [n (%)]	Test of significance	P
Nasal mucosa dryness	12 (40.0)	8 (26.7)	$\chi^2 = 1.2$	0.274
Nasal crusts	10 (33.3)	7 (10.0)	$\chi^2 = 0.738$	0.390
Nasal stuffiness	8 (26.7)	5 (16.7)	$\chi^2 = 0.883$	0.347
		83.3		

The present study was carried out to evaluate the effect of pure sesame oil in treatment of nasal dryness due to various causes and to compare its results with that of ISCS. Sixty patients were taken randomly and examined to diagnose the cause of dryness. The present study found that smoking is the most common cause of dryness in our series 24 (40 %) out of 60. This could be due to prevalence of smoking in Middle East and Egypt. There were no other series reported smoking as an important cause of nasal dryness. Bjork-Eriksson et al.<sup>4</sup> in their series reported that 20 patients experiencing problems with nasal dryness, nine patients of them lived in a dry environment, four were using local steroids, two were taking acetylsalicylic acid, four patients had undergone surgery for deviation of the nasal septum and the same number had some form of allergy. The other 20 patients had previously undergone nasal irradiation.

The patients in their case series have not reported smoking. The other study, which included 79 patients and was reported by Johnsen et al.,<sup>5</sup> focused on nasal dryness throughout the winter. On 55 (70 %) of 79 days, the outdoor absolute humidity was less than 5 g/m<sup>3</sup>, ranging from 1.9 to 7.6 g/m<sup>3</sup>. They excluded patients with common cold, acute sinusitis, unilateral nasal symptoms, present allergic rhinitis symptoms, marked deviated septum, and those receiving treatment with steroids nasal spray, decongestants nasal drops, or antiallergic drugs. In this series, there were no cases with smoking that were documented.

The relation between smoking and nasal dryness and how smoking lead to this problem needs to be clarified. Previous studies on the effect of smoking on nasal mucosa did not give attention to dryness. Pagliuca et al.,<sup>8</sup> studied the cytological and functional alterations of nasal mucosa of smokers and whether it is temporary or permanent. Their preliminary research indicates that these modifications are temporary and that the nasal mucosa of exsmokers regains normal cytological functional characteristics. According to Lieu and Feinstein<sup>9</sup>, impaired mucociliary clearance results in secretion stasis and predisposes to recurrent rhinosinusitis.

Table 5. A comparison the population characteristics between the group I and group II as regards to posttreatment data.

	Group I (N = 30) [n (%)]	Group II (N = 30) [n (%)]	Test of significance	P
Nasal mucosa dryness	2 (6.7)	8 (26.7)	$\chi^2 = 4.32$	0.03
Nasal crusts	1 (3.3)	7 (10.0)	$\chi^2 = 5.19$	0.02
Nasal stuffiness	0	5 (16.7)	$\chi^2 = 5.45$	0.01
		83.3		

There were statistically significant differences detected between group I and group II cases as regards to mucosal dryness, nasal crusts, and nasal stuffiness ( $P = 0.03, 0.02, \text{ and } 0.01$ , respectively).

Several of chemical components in cigarette smoke such as phenol, formaldehyde, acrolein, and potassium cyanide are extremely hazardous to respiratory cilia.<sup>10</sup> Whether the direct effect by chemical toxins in cigarette smoke is the cause of irritation, stuffiness, and dryness or they have an impact on mucociliary function and clearance, which causes stasis and crust formation that leads to dryness is not fully documented.

Further study on the effect of cigarette smoking and nasal dryness is needed to clarify the pathogenesis and how smoking causes nasal dryness.

The present study found that pure sesame oil is superior to ISCS in treatment of dry nasal mucosa. There were statistically significant difference detected between group I and group II cases as regards to nasal mucosa dryness, nasal crusts, nasal stuffiness ( $P = 0.03, 0.02, \text{ and } 0.01$ , respectively).

The result of the present study was in agreement with the study of Bjork-Eriksson et al.<sup>4</sup> They reported 20 patients with nasal dryness due to various causes and another 20 patients with iatrogenic cause (radiotherapy) of dryness in the nasal mucosa. Both groups were treated with local sesame oil for 20 days, three times a day. They reported that the greatest effect was exerted on dryness; there was less itching and burning and less feeling of irritation.

The treatment also has a good effect on the formation of crusts; there is less dried mucus in the nose.

Another study conducted by Johnsen et al.<sup>5</sup> which gives a good results of using pure sesame oil in treatment of nasal dry mucosa due to dry climate. On 79 participants, they assessed the effectiveness of pure sesame oil therapy versus ISCS in treating dry nasal mucosa. When pure sesame oil was utilized compared with ISCS, they discovered that nasal mucosa dryness improved significantly ( $P < 0.001$ ). Pure sesame oil also resulted in greater improvements in nasal crusts ( $P < 0.001$ ) and nasal stuffiness ( $P < 0.001$ ). They came to the conclusion that pure sesame oil was statistically significantly,

more efficient than ISCS at treating nasal mucosa dryness caused by a dry winter climate.

Probably, one of the important effects of sesame oil on nasal mucosa is nourishing and moisturizing the nasal mucosa leading to deep relief to dry, irritated, or congested nasal passage. Among the other benefits lubricating the nasal cavities with herbal oil can help ease mental and emotional stress and tension. It has been used in traditional Chinese medicine since 16 century to relieve discomfort associated with nasal cold and chronic sinusitis and it has been also used in India over 3500 years for its powerful moisturizing effect.

Nasal wash, nasal oils, and nasal ointments are all used as local treatments for dry nose. The main goals of these treatments are to rehydrate the nasal passages, dissolve crusts, and regenerate nasal mucosa. Sesame oil is one of many vegetable oils with a high content of vitamin E, as well known. The tocopherol in pure sesame oil may act as a scavenger, neutralizing airborne oxidants like ozone and nitrogen oxides, preventing inflammation of the tissue that would happen if the tocopherol were integrated into cell membranes. A carry over effect may be anticipated.<sup>5</sup>

According to the current study it was found that the side effects from utilizing sesame oil was few. Two out of 30 patients found it uncomfortable. In contrast to mineral oils like paraffin oil, vegetable oils like sesame oil do not have any negative effects on the lungs. When paraffin was used as nasal drops or sprays, the danger of lipid pneumonia and paraffin granuloma was mentioned. Mineral oils may accumulate and cause fibrosis in the lungs.<sup>11</sup> Although sesame oil may be absorbed and is not encapsulated like paraffin oil. They mostly expectorated, which causes little to no lung injury.

## 5. Conclusion

Pure sesame oil is superior to ISCS in relieving symptoms of nasal dryness due to various causes. The present study recommends use of pure sesame

oil in treating nasal dryness due to various causes as it improves nasal dryness without side effects.

### Conflicts of interest

There are no conflicts of interest.

### References

1. Keck T, Lindemann J. Strömungssimulation und Klimatisierung in der Nase. *Laryngo-Rhino-Otol.* 2010;89(S 01): S1–S4.
2. Kassel K. *Geschichte der Nasenheilkunde von ihren Anfängen bis zum 19. Jahrhundert II.* Hildesheim: Georg Olm; 1967: 176–182.
3. Cody DT, Kern EB, Pearson BW. *Diseases of the Ears, Nose, and Throat: A Guide to Diagnosis and Management.* Chicago, Ill: Year Book Medical Publishers; 1981.
4. Bjork-Eriksson T, Gunnarsson M, Holmstrom M, Nordqvist A, Petruson B. Fewer problems with dry nasal mucous membranes following local use of sesame oil. *Rhinology.* 2000; 38:200–203.
5. Johnsen J, Bratt BM, Michel-Barron O, Glennow C, Petruson B. Pure sesame oil vs isotonic sodium chloride solution as treatment for dry nasal mucosa. *Arch Otolaryngol Head Neck Surg.* 2001;127:1353–1356.
6. Proetz AW, McMahon BJ. Humidity, a problem in air conditioning. *Laryngoscope.* 1956;66:1350–1351.
7. Lindwall F. *Luftfuktigheten Och Respirationsvägarnas Slemhinna in Diseases of Northern Sweden.* vols. 13–22. Umeå, Sweden: Tika Pharmaceutical; 1967.
8. Pagliuca G, Rosato C, Martellucci S, et al. Cytologic and functional alterations of nasal mucosa in smokers: temporary or permanent damage? *Otolaryngol Head Neck Surg.* 2015;152: 740–745.
9. Lieu JE, Feinstein AR. Confirmations and surprises in the association of tobacco use with sinusitis. *Arch Otolaryngol Head Neck Surg.* 2000;126:940–946.
10. Dalhamn T, Rylander R. Ciliotoxicity of cigar and cigarette smoke. *Arch Environ Health.* 1970;20:252–253.
11. Spencer H. *Pathology of the Lung 4th Edition Volumes 1 and 2.* H. Spencer. United Kingdom: Pergamon Press; 1985. ISBN 10: 0080307728 ISBN 13: 9780080307725.