

Fewer problems with dry nasal mucous membranes following local use of sesame oil

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SUMMARY

Many people experience problems with a dry nasal mucous membrane, often without wondering why. Their noses itch and burn and dried mucus collects there. These problems are exacerbated during the winter, in air-conditioned environments and after nasal irradiation.

Twenty patients experiencing problems with dryness of the nose were selected from outpatient clinics, together with twenty patients who had previously undergone nasal irradiation.

During the first five days no treatment was administered. For the following twenty days the patients sprayed sesame oil into each nostril three times a day. For the last five days no treatment was given.

When both groups received treatment and sprayed sesame oil (NozoilTM) in their noses, the nasal problems decreased significantly. The greatest effect is exerted on dryness. The side effects from using this oil are few in number and mild.

Key words: irradiation, nasal dryness, NozoilTM, sesame oil

INTRODUCTION

The fact that people could experience problems in the nose in the form of irritation and dryness was documented 2,500 years ago. The same reference also mentioned that the best treatment was to drip sesame oil into the nose (Kassel, 1967).

Nowadays, this problem is known as rhinitis anterior sicca, and is relatively common, especially when the air humidity is low, as it is during the winter, and in a dry air-conditioned environment. Many elderly people also experience problems as a result of reduced secretion from the nasal mucous membrane. They experience itching and burning at the front of their noses.

Most patients who undergo radiotherapy directed at the nasal mucous membrane subsequently experience problems of dryness and dried mucus in their noses. Some of them also experience nasal blockage. In a study in Florida, 9 patients were examined an average of 55 months after the completion of radiotherapy involving an average dose of 70 Gy and it was found that none of them had functioning cilia and their ability to transport saccharine was non-existent (Stringer et al., 1995). These patients also experienced more nasal blockage and more mucus formation, but they did not suffer from more infections in the nose and sinuses. It is known from animal experiments that the activity of the cilia is destroyed for a long period following the irradiation of the nose at doses as low as 4 Gy, and that

the mucous membrane is transformed into squamous epithelium (Ohashi et al., 1988).

A common form of treatment for patients who have received nasal radiation has been to begin by rinsing the inside of the nose with saline solution, and then to drop peanut oil, purchased at a pharmacy, into the nose using a pipette. For several years now sesame oil of medical grade has been available in nasal spray. The 1999-2000 edition of the Swedish Drug Information Book recommends this oil (NozoilTM) as a treatment for patients with rhinitis anterior sicca (Stjernqvist et al., 1999).

The purpose of this study was to evaluate the effect of this oil on a group of patients seeking treatment from an otorhinolaryngologist for dryness of the nose, and a group of patients who had received radiotherapy resulting in a dry nasal mucous membrane. The incidence of side effects and the patients' willingness to continue the treatment was also studied.

MATERIALS AND METHODS

Patients with dryness of the nose

Twenty patients experiencing problems with dryness of the nose who were willing to participate in a study of NozoilTM were selected from the out-patient clinic at the Department of Otorhinolaryngology, Huddinge University Hospital, and at the Department of Otorhinolaryngology, Västra Frölunda Specialist Hospital, Göteborg, Sweden. Their average age was 59 (range

32-78), 6 men and 14 women. In addition to dryness of the nose, 19 also stated that they had problems with crusty formations, while 16 experienced irritation of the nose. In most cases the symptoms could be objectified when the nasal mucous membrane was examined. Nine patients lived in a dry environment, 4 were using local steroids, and 2 were taking acetylsalicylic acid, but none of them was taking decongesting nose drops. Five had an impaired sense of smell, while 8 suffered from habitual nosebleeds i.e. they suffered nose bleedings several times a year. Four patients had undergone surgery for a deviation of the nasal septum, and the same number had some form of allergy. Apart from dry nasal mucous membranes, none of the patients experienced any other nasal disorders requiring treatment according to the doctor, including the patients in the study.

Irradiated patients

Twenty patients who had previously undergone nasal irradiation, were selected from the patient register at the Department of Oncology, Sahlgrenska University Hospital, and were asked whether they would be prepared to participate in this study. Fifteen of them, 11 men and 4 women agreed, and they were all included. The average age of the participants was 63 (range 32-84) and an average of five years (range 1-11 years) had passed since radiotherapy had been administered to the nose at an average dose of 51 Gy (range 41-65 Gy). Nine of 15 patients had more problems with dryness of the nose (itching, burning, irritation) following the radiotherapy, 10 had more problems with crusty formations in the nose (different forms of dried mucus) and 7 had more problems with nasal blockage.

Treatment

Several years ago the Swedish Medical Products Agency approved the use of Nozoil™ as a natural remedy (Prevancure AB, Box 2116, SE-421 02 Västra Frölunda, Sweden). It contains sesame oil of medical grade, and can be sprayed into the nose in small doses (25 µl). The normal dose is three sprays in each nos-



Figure 1. An irradiated patient who has undergone surgery and has an almost invisible scar to the right of the outside of the nose spraying the nose with sesame oil.

tril three times a day (Figure 1). Sesame oil has been used for many years to dissolve fat-soluble pharmaceuticals, which have been administered in the form of intramuscular injections (Brown et al., 1994; Svendsen et al., 1979; Théon, 1993). No local reactions at doses of up to 4 ml have been reported, nor have any allergic reactions.

Every day the patients were asked to register the following three parameters on a visual analogue scale: nasal blockage, dryness of the nose (itching, burning, irritation), crusty formations in the nose (different forms of dried mucus). On the scale that was used, 0 = no problems and 50 = the worst problems imaginable. The study lasted for 30 days.

During the first five days no treatment was administered in order to obtain starting values. During the following twenty days the patients sprayed sesame oil into each nostril three times a day. For the last five days no treatment was given in order to determine whether there was any lasting effect or whether the problems recurred. Several of the patients were already using nasal oil regularly before the study began.

To give the effect of the oil an opportunity to disappear, and to enable the patients to accustom themselves to registration, no treatment with nasal oil was given for the first five days.

Statistics

Three different periods were compared with one another. Period A corresponded to day 5, period B to days 10-25, and period C to day 30. Four different results were regarded as possible: $A < B$ and $B > C$, which would provide the weakest support for an effect, and had a score of 1; $A < B$, and $B < C$ produces a score of 2; $A > B$ and $B > C$ was given a score of 3 and $A > B$ and $B < C$, which provided the strongest support for an effect, received a score of 4. If the H_0 hypothesis of no effect applies, the probability of a score of 1, 2, 3 and 4 is the same, 0.25. We used the test statistics $\sum \delta_j(i)$, where $\delta_j(i)$ assumes a value of 1, if individual j has a score = 1, otherwise its value is 0. The p-values are given.

The study was approved by the Local Committee of Ethics in Göteborg, Sweden.

RESULTS

Patients with dryness of the nose

The average VAS value for dryness was 32 before the treatment began. During the treatment it fell to almost half ($p < 0.05$) (Figure 2). When it came to the symptoms of crusty formations in the nose, an improvement was also seen when the oil was used ($p < 0.05$) and nasal blockage also improved ($p < 0.05$).

Four of 20 patients found the oil unpleasant, 1 patient said that the oil smelt, 1 patient that it dropped from the nose, 1 patient experienced itching and 1 patient nasal blockage. When it came to the future, 10 patients said that they were planning to use the oil frequently or every day, 6 sometimes, 1 depending on the price, and 3 patients not at all. Two of these 3 did not experience any discomfort, while the third patient stated that the oil had

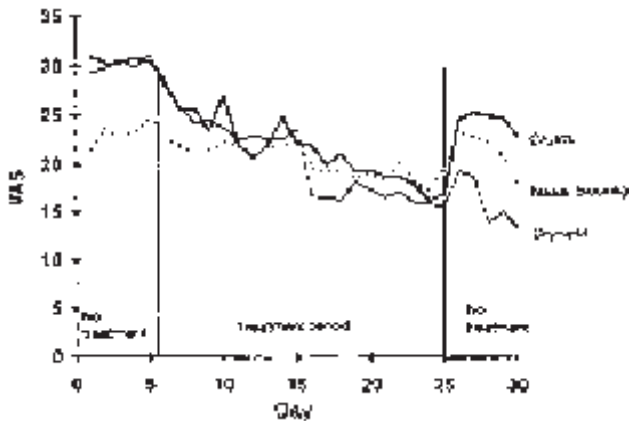


Figure 2. For a period of 30 days, patients with dry nasal mucous membranes were asked to register their nasal problems on a visual analogue scale where 0 = no problems and 50 = the worst problems imaginable. The mean values for the different days are shown in the figure, as is the period during which the nasal oil was used. The problems decreased significantly during the treatment period when it came to dryness $p < 0.05$, crusty formations $p < 0.05$ and nasal blockage $p < 0.05$.

an effect on dryness but produced nasal blockage as a side effect.

Irradiated patients

Three patients experienced no problems from their noses and therefore made no daily registrations. One patient thought the oil was very good but made no daily evaluations. The remaining 11 patients all experienced fewer problems in their noses during the period using Nozoil[®] compared to the period not using the oil. The p -value for dryness of the nose was < 0.001 , while the corresponding value for crusty formations in the nose and nasal blockage were < 0.01 and < 0.05 respectively. The mean value for the different days is shown in Figure 3.

One patient, who did not have any problems thought that the oil was too strong to use three times a day, while another said that his nose started to drop after using the oil. No other forms of discomfort or side effects were registered. Thirteen patients planned to continue using the nasal oil after the study.

DISCUSSION

By applying sesame oil to dry and irritated nasal mucous membrane, it is possible to reduce problems of the nose. This method has been used for many centuries; the Indian doctor Susruta regarded sesame oil as a universal remedy for different nasal problems (Kassel, 1967). In modern literature, sesame oil has been recommended for treatment of atrophied nasal mucous membranes (Cody et al., 1981). The 1999-2000 edition of the Swedish Drug Information Book suggests that rhinitis anterior sicca should be treated with sesame oil (Stjernquist et al., 1999).

In this study we choose to examine two different groups of patients, one group in which dryness of the nose could be due to various causes leading to a visit to a specialist, and one group

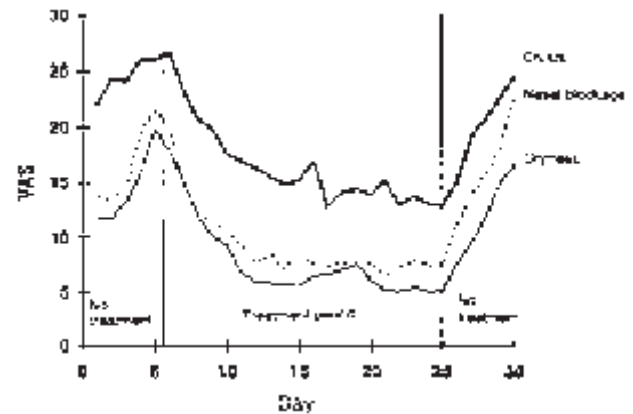


Figure 3. For a period of 30 days the irradiated patients were asked to register their nasal problems on a visual scale where 0 = no problems and 50 = the worst problems imaginable. The mean values for the different days are shown in the figure, as is the period during which the nasal oil was used. The problems decreased significantly during the treatment period when it came to dryness $p < 0.001$, crusty formations $p < 0.01$, and nasal blockage $p < 0.005$.

in which there was an iatrogenic cause (radiotherapy) of dryness in the nasal mucous membrane.

When the symptom scores are examined, it can be seen that dryness of the nose and crusty formations inside the nose are given the same score by the first group, whereas the irradiated patients find crusty formations a more severe problem than dryness.

When both groups receive treatment and spray sesame oil into their noses, the nasal problems decrease significantly. The greatest effect is exerted on dryness; there is 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.

In a study by Herbert Riechelmann evaluating the ciliary beat frequency of the respiratory epithelia from the posterior third of the nasal floor following a one hour exposure of sesame oil in eight healthy volunteers no cilio-toxic effect were found (Personal communication on March 19th 1995). For many years, sesame oil of pharmaceutical quality has been used as a solvent for drugs given both intra-muscularly and topically for bronchography since the oil has been found to be stable, neutral, inert and non-irritating. Although allergy against sesame seeds has been reported for a small number of patients, none of these patients were found to be allergic against sesame oil of pharmaceutical quality (Steirich, 1989).

One third of the irradiated patients were using sesame oil before the study began and this explains why the registered values show fewer problems on the first day compared with day five, when they had used no oil for five days. In this group the problems also increased during the last five days, when the patients received no treatment. Changes in the irradiated tissue cannot

be expected to disappear as a result of treatment with sesame oil.

In the group that had not undergone radiation therapy, the problems increased immediately after the end of treatment. After a couple of days, however, the problems once again decreased, so there may be some residual effect that can explain that these problems are partially reversible.

Although the results all reached significance, the data have to be considered as preliminary because of the small number of patients and a study with a longer evaluation period is needed to clarify the long-term effect.

During the treatment period the patients experienced little discomfort, and few side effects from the oil. When patients, who have had cancer, are treated, the question of cancer recurring as a result of the treatment is always raised. The risk of sesame oil being carcinogenic must be regarded as very small, as the oil has characteristics which inhibit tumour growth. In a study of rabbits, which developed cancer of the liver in a model, the rate of tumour growth was reduced to one-third when the oil was injected into a liver artery (Kitamura et al., 1986). When cell cultures were made of different specimens of human colon cancer cells, it was found that sesame oil had greater inhibitory effect on all three cancer cell lines than on normal colon cells (Salerno et al., 1991).

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