

Research Article

Protective Efficacy of Olive Oil for Sore Nipples during Nursing

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Submitted: 04 October 2014

Accepted: 05 December 2014

Published: 07 December 2014

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OPEN ACCESS**Keywords**

- Olive oil
- Lactation
- Sore nipples

Abstract

Objectives: Sore nipple is a common problem during the lactation period. We aimed to determine the efficacy of olive oil for the prevention of sore nipples.

Methods: Patients were requested to apply olive oil to one nipple and lanolin to the other nipple before and after suckling, and they were instructed to clean the lanolin before suckling. They used the olive oil without cleaning the nipple first. They were asked to use the same ointment on the same nipple for each use until the end of the study. If they were satisfied with only one of the ointments, they were advised to continue the study, applying the preferred ointment to both nipples and recording the date when they chose to switch to one modality. If there were no effects within 7 days, they were told to stop the application and failure of the topical treatment was recorded. After 15 days, patients were re-evaluated.

Results: The study was completed with 56 patients. Fifty (89.2%) of the patients were more satisfied with topical use of olive oil, and 6 (10.8 %) of them were more satisfied with lanolin. The difference was statistically significant. Both products were well tolerated, with no significant adverse events.

Conclusions: Our study suggests that olive oil is a safe, accessible, and beneficial choice for preventing sore nipples.

ABBREVIATIONS

SD: Standard Deviation

INTRODUCTION

The advantages of breastfeeding are indisputable. But painful, sore nipples are troublesome for the mothers and causes them stop nursing before the recommended time [1,2]. Commercial preparations containing lanolin or similar products are usually used to encourage the healing of sore nipples; however, the effects of these preparations are controversial [3-5]. So far, none of the products has been identified as an exact solution for this problem. Olive oil is natural oil and consists of flavonoids, and antioxidant, antibacterial, and antifungal compounds [6]. It has been tested for various skin disorders, such as atopic dermatitis [7], diaper rash [8], and skin care of premature babies [9]. Intending to define an effective and safe method for healing sore nipples, we first carried out a study in 2012, comparing olive oil and lanolin in nursing mothers [10]. In the current study, we aimed to research the preventive properties of olive oil with a well designed large sample trial.

MATERIALS AND METHODS

Between September 2012 and March 2013, patients who had delivered in the obstetrics and gynecology department of Canakkale Onsekiz Mart University were prospectively enrolled in the trial. The study was approved by the Ethics Committee of the Faculty of Medicine, Canakkale Onsekiz Mart University Hospital, and all participants submitted their signed written consent after being informed of the purpose and the procedures of the study.

After childbirth, education on breastfeeding was given to all mothers, and the same investigator performed physical examinations of all of the subjects' breasts. Patients who did not give consent, and those who were less than 18 years of age, could not breastfeed in the first 24 hours, had nipple abnormalities that might affect suckling, had contraindications for breastfeeding, or had allergy to either olive oil or lanolin were excluded.

Natural olive oil prepared with the cold press method was used. It was stored in the dark at room temperature until use. Patients were requested to apply olive oil to one nipple and lanolin to the other nipple before and after suckling, and they

were told to clean the lanolin off before suckling. They used the olive oil without cleaning the nipple first. They were asked to use the same ointment on the same nipple for each application until the end of the study. If they were satisfied with only one of the modalities, they were advised to continue the study, applying their preferred ointment to both nipples and recording the date they chose to change the preferred modality. If there were no effects within 7 days, they were instructed to stop the applications, and the failure of the topical treatment was recorded. After 15 days, patients were evaluated once more. We obtained information by telephone interviews. No adverse effects were recorded, and the mothers reported that both of the topical agents were easy to apply and were well tolerated.

Data were analyzed with the SPSS version 15.0 software program (SPSS, Inc., Chicago, IL). Study sample size was calculated according to "Categorical Data - Estimation of Sample Size and Power for Comparing Two Binomial Proportions" in Bernard Rosner's *Fundamentals of Biostatistics*. The power of the study sample size was determined at 96%. Quantitative data were expressed as mean $\pm$ standard deviation (SD), and qualitative data were expressed as numbers (percentage). The Student t-test was used for the former data and the Chi-square test was used for the latter data when determining significance. A value of $p < 0.05$ was defined as statistically significant.

RESULTS

A total of 65 patients were recruited to the study. Nine patients who did not administer the topical agents as explained were excluded. So, the study was completed with 56 patients. The mean age of the 56 patients was 30.37 ± 5.29 years. The baseline characteristics in terms of demographic data of the subjects, grouped according to their preference for either olive oil or lanolin, are summarized in (Table 1).

Fifty (89.2%) of the patients were more satisfied with topical use of olive oil, and 6 (10.8 %) of them were more satisfied with lanolin. Both products were well tolerated, with no significant adverse events. Fifty-two percent of the patients ($n = 26$) noted that they used the olive oil when they remembered, 40% ($n = 20$) used it for every suckling, and 8% ($n = 4$) used it when they felt pain. In the lanolin group, these rates were 66.7% ($n = 4$), 16.7% ($n = 1$), and 16.7% ($n = 1$), respectively. There was no significant difference between the two groups ($p = 0.486$).

Mean period for choosing to change to a single ointment was 3.82 ± 2.06 days. The ones who continued with the olive oil stopped the use of lanolin in 3.89 ± 2.12 days, and those who continued with lanolin stopped applying olive oil in 3.00 ± 0.82 days. There was no significant difference in the number of days before changing to one product ($p = 0.412$). The reasons for changing are summarized in (Table 2).

Forty-three (86%) of the 50 patients who were satisfied with olive oil completed the study using only olive oil, and 4 (66.7%) of the 6 patients who were satisfied with lanolin completed the study using only lanolin.

Throughout the study in 32 patients no sore nipple occurred.

Table 1: The baseline characteristics of patients.

Age	30.37 $\pm$ 5.29
Number of previously suckled baby	1.77 $\pm$ 1.06
$\leq$ basic education	15 (26.8%)
Employed	18 (32.1%)
Living in urban	28 (50%)
Vaginal delivery	15 (26.8%)

Table 2: The reasons of choosing one of the ointments.

	Olive oil	Lanolin	p
More effective	27 (62.8%)	2 (50%)	0.0001
Easily applicable	1 (2.3%)	0 (0%)	0.0001
More effective and easily applicable	9 (20.9%)	2 (50%)	0.0001
Other	1 (2.3%)	0 (0%)	0.0001

Sore nipples were observed in 4 (7.1%) patients' olive oil used nipple, and 19 (33.9%) patients' lanolin used nipple. In lanolin used nipples, 10 patients (17.9%) noted mild pain, 14 patients (25%) reported moderate pain and 6 patients (10.7%) reported severe pain. In olive oil used nipples; 13 patients (23.2%) noted mild, 5 (8.9%) noted moderate, and 1 (1.8%) noted severe pain. No pain was reported by the 37 patients (66.1%) of the olive oil used nipples and 26 patients (46.4%) of the lanolin used nipples.

DISCUSSION

Today it is well known that breast milk provides the ideal nutrition for newborns. Unfortunately, sore nipples cause great problems for lactating mothers and this leads to cessation of breast feeding [1,2].

Lee et al. [11] reported the frequency of sore nipples and breast engorgement problems as 67%. In the literature, there are several studies about preventing or treating sore nipples, including research into lanolin, silicon nipple shields, and education for correct breast feeding [2,12,13]. Mohammadzadeh et al [3] recommended hind milk for better healing for sore nipples. Tanchev et al [4] suggested purified lanolin (Lansinoh) both for prevention and treatment of sore nipples. Kuşcu et al [14] reported that collagenase is superior to warm water and soap and similar to dexpanthenol in preventing nipple pain. Melli et al [15], found that peppermint gel for sore nipples was more effective when compared to a placebo and lanolin.

Olive oil is a natural product. It contains flavonoids and antioxidants and has antibacterial and antifungal effects when used topically. It is used in dermatologic disorders such as atopic dermatitis, psoriasis, diaper dermatitis, and wound healing [16-19]. Moreover, it is found to be safe and beneficial even for parenteral infusion in preterm infants [18]. To date, there are only a few, limited studies about its use for sore nipples. So, we planned to investigate the beneficial effects of olive oil in nursing mothers.

In this study, we used extra virgin olive oil. Olive oil was obtained from the Ayvalik variety of olives, which are grown

in Edremit country in the northwestern region of Turkey. This region is well known for the high quality olive oils produced from the Ayvalik variety of olives. The olive oil was analyzed for its some chemical characteristics at the laboratory of Canakkale Onsekiz Mart University, Faculty of Agriculture, and Department of Horticulture. According to obtained results, the olive oil that was used in this experiment was classified as extra virgin olive oil due to its low acidity. The olive oil had 0.8% acidity, expressed as no more than 0.8 grams of oleic acid per 100 grams of oil for classification as extra virgin olive oil.

Peroxide value is the primary measurement of the rancidity of a particular extra virgin olive oil. This number must be equal to or less than 20 based on international olive oil standards. This value for the olive oil we used was 7.97, which indicates that it was a high quality olive oil without rancidity. Total poly phenol content was 254 mg/kg in the olive oil. This value shows that the olive oil had high antioxidant content, was highly stable, and was high quality. The study was open. We compared olive oil with lanolin, which is known to be effective in the management of sore nipples; in consideration of the comfort of both mother and baby, we thought it would be unethical to use a placebo. Unlike the studies reported in the literature, in our study, mothers tried two kinds of products at the same time: lanolin on one nipple and olive oil on the other. This gave us a chance to compare the exact efficacy of both products. We eliminated the individual factors that might affect wound healing.

In our previous study, [10] we had found some beneficial effects of olive oil in the management of sore nipples. In the current study, we tried to further investigate olive oil's possible positive effects on the prevention of sore nipples. We used standardized natural olive oil, which we had analyzed for its molecular content and standardized pure lanolin. We used a larger sample size, which was calculated by power analysis prior to the study, and we used the ointments both before and after the suckling. The patients who more satisfied with either olive oil or lanolin, completed the study with the effective one and discontinued use of the other in 3.89 ± 2.12 and 3.00 ± 0.82 days (continued with olive oil and lanolin, respectively). This may show the rapid response from use of the products. This is pleasant for both the patients and clinicians.

Most of the studies reported in the literature examined the mothers who already had sore nipples, and the results don't include the efficacy for the prevention of sore nipples in nursing mothers. It is important to do something about nipple soreness before the mothers develop painful cracks. Our study stressed using the products early in the postpartum period before soreness occurs, and emphasized the importance of prevention methods in health care.

LIMITATIONS

There are also limitations to our study. We obtained the results by telephone interviews with the patients and didn't have a chance to evaluate the patients' breasts using a clinical score. However, participants compared their two nipples, so the possible subjective evaluation bias lost its importance.

CONCLUSION

Our study suggests that olive oil is a safe and beneficial choice for preventing sore nipples. Further studies must be carried out to determine the best strategy for application of olive oil in the management of sore nipples.

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Cite this article

Oğuz S, Işık S, Çakır Güngör AN, Şeker M, Ogretmen Z (2014) Protective Efficacy of Olive Oil for Sore Nipples during Nursing. *J Family Med Community Health* 1(4): 1021.