



The effect of topical application of lavender essential oil on the intensity of pain caused by the insertion of dialysis needles in hemodialysis patients: A randomized clinical trial[☆]



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KEYWORDS

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Needle;
Lavender;
Pain

Summary

Background: Patients undergoing hemodialysis experience constant fear and anxiety due to the pain of the insertion of dialysis needles, which might lead to certain physiological and psychological complications for them in the long term. It is therefore essential to control their pain through a simple, safe method.

Objective: The present study was conducted to determine the effect of the topical application of lavender essential oil on the intensity of pain during the insertion of dialysis needles in hemodialysis patients.

Design: This open crossover study was conducted on 34 hemodialysis patients with arteriovenous fistula (AVF) admitted to the dialysis unit of one of the hospitals of Semnan University of Medical Sciences in 2013. The intensity of pain was measured in all the patients in three different states during the insertion of arterial needles for hemodialysis: (1) The topical application of 100% lavender essential oil, (2) no intervention, (3) placebo (with water).

Main outcome measures: Pain intensity was measured in this study through the numeric rating scale (NRS) of pain.

Results: The findings showed that the mean \pm SD of pain intensity was 2.91 ± 1.69 with the topical application of lavender, 4.59 ± 2.02 in the no intervention state and 4.18 ± 1.66 with the placebo state. Statistical tests showed a significant difference between the patients' intensity of pain in the three different states ($p=0.001$).

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Conclusion: Based on the findings of the study, the topical application of lavender decreases moderate intensities of pain during the insertion of dialysis needles. Accordingly, lavender oil may be an option to reduce pain by insertion of hemodialysis needles.

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Introduction

Chronic renal failure is globally rising in prevalence. In 2000, the number of patients treated for chronic renal failure was about 1,100,000 across the world and reached 2,654,000 by the end of 2009. The 6–7% increase indicates a growth rate more than that of the global population itself.¹ In Iran, the growth rate of the disease is higher than the mean international growth rate and is about 12% per year.² Many patients with chronic renal failure can be successfully treated with hemodialysis.³ On average, a hemodialysis patient undergoes ten AVF punctures per month and continues to undergo the procedure throughout his life or until a successful renal transplant.⁴ Repeated AVF punctures create considerable amounts of pain for the patient due to the diameter and length of the needles used.⁵ A total of 47% of hemodialysis patients have fear of needles.⁶ More than one fifth of them consider the pain of the insertion of vascular needles to be unbearable. The repetition of this pain can lead to depression and reduced quality of life in hemodialysis patients.⁷ The results of a study conducted in 2008 showed that hemodialysis patients collectively suffer from needle pain, which is one of the factors causing patients over 65 years to give up hemodialysis.⁸

McCaffery argues that pain is whatever the person experiencing it describes it to be and exists whenever the person experiencing it says that it does.⁹ The perception of pain includes different mental processes, such as the individual's feelings and beliefs about pain.¹⁰ The early experience of pain therefore leads to a poor attitude toward treatment and increases fear and avoidance of treatment.¹¹ Since a needle-phobic patient normally resists treatment, this state is considered a significant barrier for the efficiency of the health care system.¹² Lai et al. revealed one of the reasons for dialysis withdrawal to be the repeated pain of needle insertions at the start of dialysis.¹³

Pain control is one of the main tasks of nursing.¹⁴ Pain reduction leads to the acceptance of the procedure and ultimately improves the patients' quality of life¹⁵ and is associated with their satisfaction with the hospital personnel,¹⁶ therefore, nursing personnel should always seek ways for an effective pain control. Complementary and alternative medicine is a growing industry in health care systems with an application that is constantly evolving.¹⁷ The use of complementary treatments and natural alternatives decreases complications and reduces the need for synthetic analgesics.¹⁸ Some studies have shown that lavender has analgesic,^{19–21} wound healing,²² antibacterial, anti-fungal, anti-flatulent, sedative and antidepressant effects and can effectively heal burns and insect bites.²³ Lavender and its main components, linalyl acetate and linalool, have been proposed as topical palliatives of pain in animal models.²⁴

Acute pain is a major problem in intensive care patients.²⁵ This multidimensional phenomenon has several

physical, psychological and social components and is a major problem for about 50% of hemodialysis patients.²⁶ Therefore, preventing further pain and finding a simple, safe method for its reduction are necessary. Due to the necessity of hemodialysis for the survival of patients and repeated needle insertion for dialysis patients, we decided to study the effect of a medicinal plant that has been shown to have analgesic effects in some cases, so this study aimed to investigate the effects of lavender essential oil on reduction of pain during insertion of dialysis needles in hemodialysis patients.

Methods

Design and participants

This open crossover study was conducted on 34 patients admitted to the dialysis unit of a Semnan University of Medical Sciences' hospital in 2012. The Ethics Committee of Semnan University of Medical Sciences approved the study (code No. IRCT201303076342N3). After receiving the approval of the Ethics Committee and obtaining written consent from the patients, the subjects were selected through the convenience sampling method and according to the inclusion and exclusion criteria. The inclusion criteria consisted of being over 18 in age, being in a state of full consciousness, requiring at least 2 sessions of hemodialysis per week, the absence of eczema and fragrance allergies, a minimum of 6 weeks since the surgical creation of fistula, not having taken tranquilizers, sedatives or analgesics for at least the preceding 6 h and not suffering from neuropathy and diabetes. Patients with either one of the following conditions were excluded from the study: history of addiction, smoking, peripheral vascular disease, known psychological disorders based on the patient's records, failed first attempt at vascular access and unwillingness to participate in the study for whatever reason. In addition, if a patient experienced pain or inflammation at the site of fistula during the intervention or had used a hot water bottle, he would not be tested on that day. According to the study conducted by Saeki, using a hot water bottle can increase the patients' perception of pain.²⁷ All patients were also tested for sensitivity to lavender by pouring a drop of 100% lavender essential oil on the forearm skin and for olfactory health through lemon juice testing. The flow of study participants is shown in Fig. 1.

Data collection

The data collection instrument included the patients' demographic information form (enquiring about gender, age, education, marital status, occupation and history of hemodialysis) and also the pain numeric rating scale (NRS).

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