

Original Article

## The Effect of Aromatherapy Massage Applied to Facial Area upon Headache Severity among Patients who Suffered from Headache During Hemodialysis

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### Abstract

**Background:** Pain in hemodialysis patients is one of the most commonly seen problems. It is established that 50% of hemodialysis patients mainly undergo headache. The most important characteristic of the headache is that it starts during hemodialysis and ends within 24 hours following hemodialysis. Pain management requires a multidisciplinary approach. This multidisciplinary treatment approach requires use of complementary and alternative treatments. Aromatherapy massages are among the complementary methods and are effective upon the pain control.

**Aim:** The study aims to determine the effect of aromatherapy massage applied to facial area upon headache severity among the patients who suffered from headache during hemodialysis.

**Methodology:** It was a randomized-controlled experimental trial and was undertaken with the hemodialysis patients registered to the Hemodialysis Unit of Kırşehir Research and Training Hospital of Ahi Evran University. The study was completed with 50 patients who met the inclusion criteria; 25 being allocated to the experimental group and 25 to the control group. The data were gathered using a questionnaire form and VAS. During the first interview with the patients before the aromatherapy massage; questionnaire form and VAS were administered to the patients. Then, all of the patients in this group received aromatherapy massage performed by one of the researchers. At the end of the three-week aromatherapy massage performed according to the massage-application protocol; VAS was re-administered to the patients.

**Results:** Aromatherapy massage applied on the facial area during hemodialysis decreased the headache severity considerably and was an easy, economic method without any side effects.

**Conclusions:** It was concluded that aromatherapy massage was a method to be easily used by the nurses for the patients who suffered from headache during hemodialysis.

**Key words:** aromatherapy massage, hemodialysis, headache

### Introduction

Hemodialysis, one of the treatment methods of end stage renal failure, is a life-saving treatment for the patients (Alikari et al., 2015). However; despite the advancements in this treatment model, patients still suffer from physical, psychological

and social problems (Kallenbach et al., 2005; Daugias, Blake & Ing, 2001). Such symptoms as fatigue, cramp, pain, sleep-disorder, dyspnea, nausea, vomiting and constipation affect one's daily life and quality of life negatively (Legg, 2005, Kafkia, Vehviläinen-Julkunen and

Sapountzi-Krepia 2014). Nutritional habits, sexual activities, work-life, free-time activities, satisfaction with life and family and friend relations are negatively affected due to these symptoms that hemodialysis patients often undergo (Cho & Tsay, 2004; Lameire & Mehta, 2005; Yilmaz et al., 2009). Pain in hemodialysis patients is one of the most commonly seen problems. It is established that 50% of hemodialysis patients mainly undergo headache (Özdemir et al., 2013; Antoniazzi 2003). The most important characteristic of the headache is that it starts during hemodialysis and ends within 24 hours following hemodialysis (Tander et al., 2008). Headache may be caused by the possibility that large amount of change in liquid and electrolyte balance leads to changes in blood-brain barrier and vascular volume of venous area (Davison & Jhangri, 2005). Pain management requires a multidisciplinary approach. This multidisciplinary treatment approach requires use of complementary and alternative treatments. Aromatherapy massages are among the complementary methods and are effective upon the pain control (Carr et al., 2010; Snyder & Massage, 2006). In the studies that were conducted with women who had breast cancer, received palliative care and underwent pain during menstruation period or post-operation period; it was indicated that aromatherapy massage reduced pain level considerably (Kyle, 2006; Kim et al., 2006; Bauer et al., 2010; Kim et al., 2011; Ovayolu et al., 2014). It was discovered that aromatherapy massage applied for the hemodialysis patients affected not only pain but also other symptoms like pruritus positively (Ro et al., 2007). The role of the nurses in the pain control is to work as an active member of the team and to relieve the patient through knowing and assessing causes, characteristics and prevalence of the pain, the affecting factors in pain control and pain relief methods. The current study aims to determine the effect of aromatherapy massage applied to facial area upon headache severity among the patients who suffered from headache during hemodialysis.

## Methods

### Study Design

It was a randomized-controlled experimental trial and was undertaken with the hemodialysis

patients registered to the Hemodialysis Unit of Kırşehir Research and Training Hospital of Ahi Evran University.

### Sample

The minimum sample size of the study was determined as 18 patients for each group according to the statistical power with  $\alpha=0.05$ ,  $\beta=0.15$ . The study was completed with 50 patients who met the inclusion criteria; 25 being allocated to the experimental group and 25 to the control group. The data of the study was obtained using minitab: power analysis program with  $\alpha=0.05$  and power=0.89. Sample selection was randomly performed. As the result of the draw; those who received hemodialysis in the morning were allocated to the intervention group while those who received hemodialysis in the afternoon were allocated to the control group and the study was started with intervention group. Those who had been receiving hemodialysis treatment for at least three months, were aged  $\geq 18$ , received hemodialysis three times a week, had Visual Analogue Scale (VAS) score  $\geq 3$ , were not allergic to aromatic oils, had no surgical operation on facial area nor diseases related to facial nerves and tissues, had no venous diseases and accepted aromatherapy massage practice were included in the study.

### Instruments

The data were gathered using a questionnaire form and VAS. The questionnaire form was designed by the researchers after reviewing the relevant literature (Kyle, 2006; Kim et al., 2006; Bauer et al., 2010; Kim et al., 2011; Ovayolu et al., 2014; Ro et al., 2007).

The questionnaire form consisted of questions involving age, gender, educational status, marital status and the clinic visited. VAS, developed by Price et al., (1994) was used in a many studies in order to assess pain and is a reliable and valid scale (Antoniazzi et al., 2003; Davison & Jhangri, 2005; Kim et al., 2011). It is a horizontal line of 10 cm. The patients mark on the line and the point that they feel represents the severity of their pain. The VAS score is determined by measuring in "cm" from the left hand end of the line –no distress- to the point that the patients mark and the point is written down. The points change from 0 to 10 and higher points indicate

the higher level of pain (Williamson & Hoggart, 2005).

### Data Collection

During the first interview with the patients before the aromatherapy massage; questionnaire form and VAS were administered to the patients. Then, all of the patients in this group received aromatherapy massage performed by one of the researchers. Massage lasted three days a week for three weeks and with a total of nine sessions in line with massage-application protocol and each session lasted ten minutes. Massage was performed in the first hour of each dialysis session. At the end of the three-week aromatherapy massage performed according to the massage-application protocol; VAS was re-administered to the patients. The masseur-researcher participated in "Aromatherapy and Acupressure Course" organized by Ahi Evran University in collaboration with Turkish Massage Natural Therapies Association. VAS was administered to the patients of the intervention group for three weeks both before and one hour after the massage.

Aromatherapy massage solution was prepared using 48 cc of sesame oil, 1 cc of lavender oil and 1 cc of rosemary oil in a light-proof oil cup with a standard dropper (Battaglia, 2003). Before the massage, during the first follow-up; 0.1 ml. of aromatherapy oil was rubbed on the inner part of arms of the intervention group and 24 hour waiting period was spent to determine whether such allergic reactions as redness, itching, skin rash, developed or not in the area. Those who developed allergic reactions were not included in the study. In the aromatherapy massage; superficial effleurage, petrissage, friction methods were employed (Price, 1998; Rawlings & Meerabeau 2003; Buckle, 2003). During the first follow-up, questionnaire form and VAS were administered. As for the control group; VAS was administered them at the first hour and last hour of the dialysis.

### Ethics

Approval to undertake this study was gained from the ethics committee of the Erciyes University Medicine Faculty and written official permission was obtained from the Kırşehir Health Director.

### Data Analysis

Whether the data followed a normal distribution was tested with Shapiro-Wilk and Kolmogorov-Smirnov test. Statistical methods such as percentage, arithmetical mean, independent sample t and chi-square tests had been used.

### Results

It was found out that 60% of the patients of the intervention group were women, 40% were aged  $\geq 60$  years, 52% had primary school degree, 84% were married and 56% had an income equal to the expenses. As for the control group; 60% of the patients were men, 36% were aged  $\geq 60$  years, 76% had primary school degree, 84% were married and 64% had an income equal to the expenses. Socio-demographic characteristics of the intervention group and control group were similar, too ( $p>0.05$ ) (Table 1).

The cause of chronic renal failure development of 36% of the patients of the intervention group was glomerulonephritis and hypertensive nephrosclerosis and 40% went into hemodialysis for 25-36 months. The cause of chronic renal failure development of 52% of the patients of the control group was hypertensive nephrosclerosis and 48% went into hemodialysis for 13-24 months (Table 2).

It was explored that 96% of the patients took an analgesic medicine given by the health care personnel due to the headache experienced during hemodialysis. 72% of the patients preferred to sleep during hemodialysis as a method to relieve headache.

During the first week, mean pain score of the intervention group which was  $8.30 \pm 1.10$  before massage dropped to  $4.62 \pm 1.87$  after massage while mean pain score of the control group which was  $4.99 \pm 1.72$  decreased to  $4.56 \pm 1.49$ . During the second week, mean pain score of the intervention group which was  $7.12 \pm 1.21$  before massage dropped to  $3.80 \pm 2.12$  after massage while mean pain score of the control group which was  $5.21 \pm 1.42$  decreased to  $5.06 \pm 1.44$ . During the third week, mean pain score of the intervention group which was  $7.34 \pm 1.04$  before massage dropped to  $3.17 \pm 1.61$  after massage while mean pain score of the control group which was  $5.11 \pm 1.07$  decreased to  $4.98 \pm 1.31$ . There

were statistically significant differences in mean pain scores of both intervention group and control group before the massage practice of each three week ( $p < 0.001$ ). While there was no significant difference between the scores of the intervention group and control group after the massage practice at the end of the first week ( $p > 0.05$ ), it was seen during the following weeks

that there were differences. The significant difference between the groups was at a level of  $p < 0.01$  at the second week, while the significant difference between the groups increased to a level of  $p < 0.001$  at the third week (Table 3). It was understood that the massage practice performed got more effective week by week.

**Table 1. Socio-demographic characteristics and homogeneity of subjects**

Socio-demographic characteristics		Experimental (n=25) n (%)	Control (n=25) n (%)	P (t or $X^2$ test)
Gender	Female	15 (60.0)	10 (40.0)	NS
	Male	10 (40.0)	15 (60.0)	
Age (Mean)		(58.56±14.75)	(55.44±14.40)	NS
	30-39 age	3 (12.0)	3 (12.0)	
	40-49 age	4 (16.0)	7 (28.0)	
	50-59 age	8 (32.0)	6 (24.0)	
	60 age and ↑	10 (40.0)	9 (36.0)	
Education level	Literate	10 (40.0)	2 (8.0)	NS
	Primary school	13 (52.0)	19 (76.0)	
	Secondary/High school	2 (8.0)	4 (16.0)	
Marital status	Married	21 (84.0)	21 (84.0)	NS
	Single	4 (16.0)	4 (16.0)	
Economic status				NS
	Income > expenditure	6 (24.0)	8 (32.0)	
	Income = expenditure	14 (56.0)	16 (64.0)	
	Income < expenditure	5 (20.0)	1 (4.0)	

NS, Statistically no significant difference between the group of experimental and the group of control ( $P < .05$ ).

**Table 2. Disease characteristics of the patients**

Variable		Experimental (n=25) n (%)	Control (n=25) n (%)	P (t or $X^2$ test)
Cause of Chronic Renal Failure		9 (36.0)	7 (28.0)	NS
	Glomerulonephritis	5 (20.0)	2 (8.0)	
	Diabetic nephropathy	2 (8.0)	3 (12.0)	
	Cystic kidney	9 (36.0)	13 (52.0)	
	Nephrosclerosis			
Time of Hemodialysis	6-12 month	5 (20.0)	3 (12.0)	NS
	13-24 month	8 (32.0)	12 (48.0)	
	25-36 month	10 (40.0)	8 (32.0)	
	37 month and ↑	2 (8.0)	2 (8.0)	

**Table 3. Effects of aromatherapy on VAS scores according to follow-up weeks**

VAS	Follow-up Weeks					
	First Week		Second Week		Third Week	
	Pre-process ( $\bar{x} \pm SS$ )	Post-process ( $\bar{x} \pm SS$ )	Pre-process ( $\bar{x} \pm SS$ )	Post-process ( $\bar{x} \pm SS$ )	Pre-process ( $\bar{x} \pm SS$ )	Post-process ( $\bar{x} \pm SS$ )
Experimental (n=25)	8.30±1.10	4.62±1.87	7.12±1.21	3.80±2.12	7.34±1.04	3.17±1.61
Control (n=25)	4.99±1.72	4.56±1.49	5.21±1.41	5.06±1.44	5.11±1.07	4.98±1.31
<i>t</i>	8.064	0.141	5.118	-2.457	7.453	-4.338
<i>P</i>	0.000	0.888	0.000	0.018	0.000	0.000

### Discussion

Headache is a commonly seen problem experienced by hemodialysis patients and there are many factors in the development of this problem. Some of them may be as follows: toxic effect of urea upon brain, tension-related changes and patient's unchanged position during the hemodialysis treatment for a long time (Davison & Jhangri, 2005).

Because pain may be associated with low quality of life, it should effectively be managed. Today; pharmacological methods are commonly used for pain management. Analgesic treatment is the most preferred treatment method to eliminate pain because its effect is quick and its use is easy. Irrational and intense medicine use places a burden both on individuals' budget and national economy, leads to negative effects upon physiologic functions and drug-tolerance occurs particularly when narcotics are used because dose is increased more each time (Nester & Hale, 2002). Another approach used for the management of the pain is non-pharmacological methods. Because the use of non-pharmacological methods –alone or in conjunction with pharmacological methods– creates a pain decreasing effect; its use has spread particularly over the last years (Snyder & Wieland, 2003). Non-pharmacological methods aim to control pain using methods other than medicines. The use of non-pharmacological methods to eliminate pain results from the wish to decrease the use of analgesics and to increase the quality of life of the patients by eliminating their pain as much as possible. The non-

pharmacological methods have such advantages as easy use, no side effects unlike analgesics and no economic burden upon the individuals (Owens & Ehrenreich, 1991).

Optimal pain management requires a multidisciplinary approach that includes pharmacological and non-pharmacological interventions (Adams et al., 2008). Although there were not sufficient number of studies on the effect of aromatherapy massage upon pain level among the hemodialysis patients; it is argued that such non-pharmacological methods as acupuncture, reflexology, music are effective upon eliminating the pain or decreasing the severity of pain (Özdemir et al., 2013; Ro et al., 2007; Stamatidis & Stathakis, 2008; Lee et al., 2011).

It was found out that there were no statistically significant differences in mean pain scores between the intervention group and control group before the massage practice. But after the aromatherapy massage practice, the difference in mean pain scores of intervention group and control group were statistically significant at 0.05 and pain severity decreased as the time and frequency of the massage was increased.

In the study; sesame oil was used as an essential oil and lavender oil and rosemary oil were used as aromatherapy oil. The reason why mean VAS scores decreased among the patients in whom aromatherapy massage was practiced may have resulted from the analgesic effect of the lavender oil and rosemary oil as well as the effect of massage chosen to apply the aromatherapy because massage is an easy way to help

relaxation, to increase wellness-feeling and to relieve pain. Massage is thought to be effective upon elimination of pain by stimulating endorphin secretion and decreasing muscle strain and anxiety. On the other hand; aromatherapy includes the use of essential oils with treatment objectives. Many of the essential oils have analgesic characteristics. The literature reports that lavender oil and rosemary oil have strong analgesic effects (Cavanagh, 2005; Dhany et al., 2012). However, aroma massage appears to prove effective in reducing psychological stress (Satou et al., 2013). In this study; the reason why mean VAS scores decreased among the patients of the control group may have resulted from the decreased blood urea thanks to hemodialysis and elimination of toxic effect of urea upon the brain. Also; that electrolyte imbalances caused by the excessive liquid volume were normalized thanks to ultrafiltration during hemodialysis may have affected the above-mentioned result.

### Limitations

The study had the limitations because there was no placebo group and did not use blinding-method. Therefore, randomized controlled studies with a broader sample in which control group, placebo group and aromatherapy group are included are needed using a longer follow-up period in order to support the findings of the current study.

### Conclusions

It was established in this study that aromatherapy massage applied on the facial area during hemodialysis decreased the headache severity considerably and was an easy, economic method without any side effects. It was concluded that this practice was a method to be easily used by the nurses for the patients who suffered from headache during hemodialysis.

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