Full Length Research Paper

Lavender aromatherapy massages in reducing labor pain and duration of labor: A randomized controlled trial

Abbaspoor Zahra[1]* and Mohammadkhani Shahri Leila[2]

[1]Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
[2] Department of Midwifery, Karaj Branch, Islamic Azad University, Karaj, Iran.

Labor pain is a challenging issue for midwifes and designing intervention protocols. Aromatherapy is one of the non-pharmacological methods for pain relief and *Lavendula* has analgesic properties. The aim of this study was to investigate the effect of aromatherapy massage with Lavender oil. This was a prospective, randomized, controlled trial that was conducted in 2008 at Mahdeeh Hospital of Tehran University, Tehran, Iran. The subjects included N=60 primiparous women in 38–42 week gestational age, who were expected to have a normal delivery. They were randomly assigned to two groups. The first group received only massage (n=30) and the second group received aromatherapy massage with Lavender oil (n=30). The intensity of pain was measured with the visual analogue scale (VAS). Results showed that pain intensity before and after intervention were significantly lower in the lavender aromatherapy massage group in the latent and active phase, and they had a lower duration of first and second stage of labor. Hence, aromatherapy massage was helpful, providing pain relief and psychological support during labor. This finding suggests that lavender aromatherapy massage is a cost-effective midwifery intervention that can decrease pain and duration of the first and second stages of labor.

Key words: Aromatherapy, complementary alternative methods/therapy, labor pain, lavender oil, massage.

INTRODUCTION

Labor pain is one of the most severe pains that women experience during their life (Lee et al., 2004). It is viewed as a complex physiological phenomenon that encompasses psychological, emotional, spiritual and physical dimensions. This approach represents a shift from the medical model (Adams, 2006). In a study by Bonica et al. (1990), 77% of primiparous reported severe or unbearable pain during labor and they also found that 35% of primiparous women had an unbearable pain, 37% sever pain and 28% had a moderate pain during their labor and delivery experience (Bonica et al., 1990).

In most maternity hospitals, pharmacological and non-

pharmacological methods are used to relieve pain. The aim of all these methods is to reduce or mitigate labor pain without any harmful effects on mother and child (Albert et al., 2009). Non-pharmacological treatments are often simple and inexpensive and can be used as replacement or complementary therapy associated with medications treatment. In non-pharmacological methods, pregnant women are the decision-maker, so they feel strengthened and it is effective on their labor progress (Lowdermilk et al., 2004); (Mckinney et al., 2005). Non-pharmacological methods for pain relief include: hypnosis, massage, heat and cold, aromatherapy, percutaneous nerve stimulation, music therapy and changing the mother status during the labor such as walking, breathing control, and accompanied by a person during labor (Behiraee, 1999; Sindhu, 1996).

Aromatherapy is used to relieve pain, anxiety, depression,

---

*Corresponding author. E-mail: Abbaspoorzahra7@yahoo.com. Tel: 009166152841.

insomnia, fatigue, asthma and even create self-confidence, success and creativity (Carroll et al., 1993) and it is applied using acupressure points, taper, compress, footbath and the oils may be massaged in the skin or inhaled by using a steam infusion or burner (Smith et al., 2011). A systematic review evaluated three studies including 117 women, and showed pain reduction after the massage (Fellowes et al., 2004). The use of aroma-therapy in labor was also explored in an observational study undertaken in the UK, involving a sample of 8053 participants (Burns et al., 2000). In this study, all consenting women who were in labor were eligible to participate, with the exception of those with multiple allergies or those in premature labor (<36 weeks of gestation). Irrespective of maternal parity or labor onset (spontaneous versus induced), women consistently reported aromatherapy as a helpful adjunct to their labor experience, and there was a lower epidural rate and opioid injection rate in the aromatherapy group (Burns et al., 2007). Essential oils that are used in aromatherapy can be obtained from various portions of plants. The smelling of these oils sends electrochemical messages through the olfactory nerve to the limbic center in the brain and stimulates the release of neurotransmitters from the hypothalamus (Cavanagh et al., 2002; Clarke et al., 1996). The essence of lavender (*Lavandula augustifolium*) usually is prepared from the root and stem of the plant. Lavender essence is used in aromatherapy and contains linalyl acetate, which is an analgesic (Cunningham et al., 2005). The root of *Lavandula* has a strong anticonvulsant effect and its leaves and flower have a pain relieving effect (Zargary, 1997).

Despite new methods of strengthening labor contrac-tions, 41.6% of Iranian women deliveries are through cesarean section (IMOH, 2006). Also, drug administration for reduction of labor pain often has some harmful effects on mother and fetus, such as decreased fetal heart rate variability after using of drug (Hill et al., 2003). During 12 weeks after birth, 67% of women with epidural anesthesia and 29% of those who had used other drugs complained of their insufficient breast milk (Volmanen et al., 2004). Also, drugs have adverse effects on labor contractions and cause prolonged labor and delivery complications, followed by some unnecessary manipulation (Carroll et al., 1993). This study was therefore aimed at investigating the effect of massage aromatherapy on intensity of labor pain and on the duration of labor.

MATERIALS AND METHODS

The study was conducted between March 2007 and June 2008 at Mahdeeh Hospital, Tehran, Iran. Inclusion criteria comprised nulliparous and multiparous women, with a singleton pregnancy of gestation age >36 weeks, singleton pregnancy with cephalic presentation, cervical dilatation≥ 4 cm and having three uterine contractions in 10 min at least with a duration of 30 s. Exclusion

criteria included, third trimester bleeding, intrauterine fetal growth retardation, multiple pregnancy, breech presentation, being athletic, addiction (alcohol and cigarettes), using analgesic during 3 h before and during the intervention, the use of sedative drugs, history of infertility, allergy to essences and use of herbal oil.

This was a prospective randomized controlled trial (RCT) with two arms comparing lavender aromatherapy massage and massage without aromatherapy groups in labor. Sweet almond was provided as carrier oil for massage. Information was gathered in the form of a short questionnaire to elicit maternal feedbacks about receiving and administering aromatherapy. In the labor ward, randomization was accomplished by taking consecutively numbered, sealed, opaque envelopes that contained the allocation to each arm of the trial. Each envelope was identical in appearance and weight. The randomly generated computer sequence (1:1 ratio) was prepared before the trial started by statistician and was only known to him. Thus, allocation concealment was assured to the point of opening the envelope. Blinding was obviously not possible.

After explanation and obtaining written consent of women, they were randomly assigned to two groups: the first group received only massage (n=30), the second group received massage aroma-therapy with 2 drops of Lavender oil dissolved in 50 cc almond oil (n=30). The massage was given to all women in a lateral position by one investigator (second author) as midwife, who had been given theoretical and practical training by a physiotherapist before the study and certified by him. Back massage was done during labor as efloraj (friction), gently with medium pushing and rhythmic in two groups in the latent phase (cervix dilated 3 - 4 cm), active phase (5 - 7 cm) and transitional phase (8 - 10 cm) of labor, for 3× 20 min (during and between contractions). Aromatherapy was administered for one of the following reasons: to alleviate pain (reduction of level pain intensity) or to augment contractions and as a means of facilitating the mechanism of labor and reducing labor duration, and its effect on type of delivery. Then women were asked to self-rate their level of pain immediately prior to receiving massage in two groups 30 - 40 min afterwards using a 10-point Likert scale, totally in six times. Neonatal outcome data included Apgar scores at 1 and 5 minute. Data on associated adverse effects were also recorded.

Ethical considerations

This trial was approved by the Research Ethics Committee of Ahwaz Jundishpur University of Medical sciences. Women completed informed written consent form. Each woman was assigned an ID code, ensuring data set anonymity. Women could withdraw from the study at any point.

Statistical analyses

Data were analyzed using SPSS 16.0. P-values of <0.05 were deemed to indicate statistical significance. Two-tailed t test was used to analyze continuous data. For example, a paired t test was performed to assess the pain level before and after receiving massage aromatherapy or massage only. Chi- Square test also was used to assess the intrapartum events and maternal satisfaction. Sample size calculation was carried out using the comparison means formula. Power was set at 0.8; alpha level was set at 0.05 and confidence interval set at 95%. The sample size calculated was 23 for each group, and by adding 30% attrition size it changed to 30 women in each group. Registration number was IRCT201105026364N1.
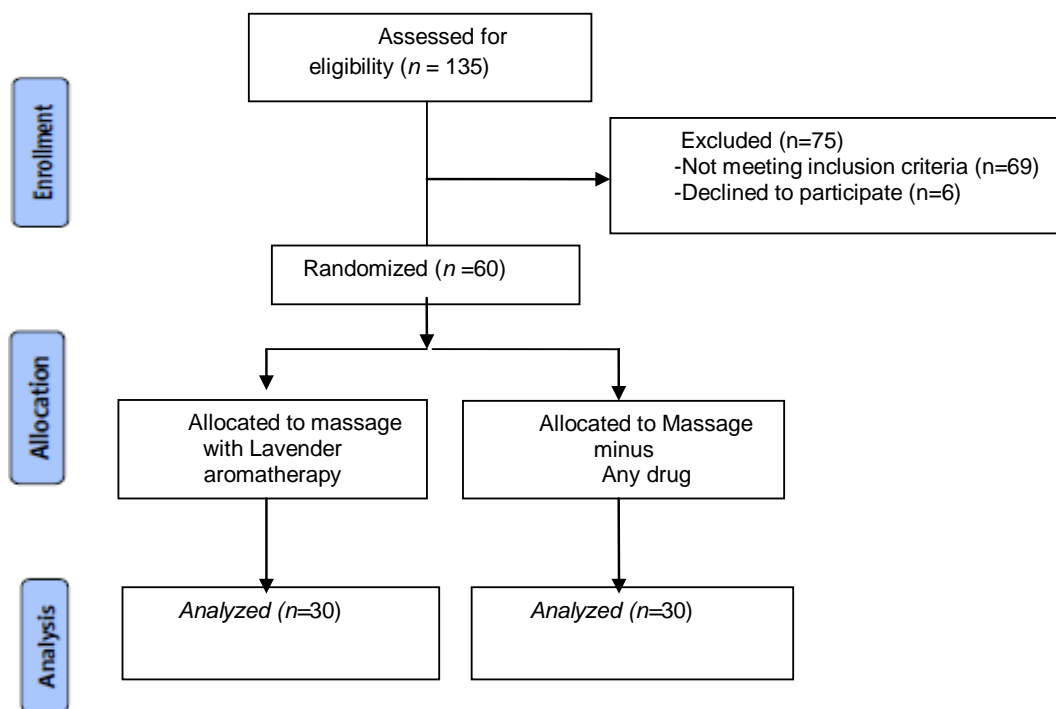
Figure 1. Recruitment and participation of patients.

RESULTS

Sixty women completed the trial as randomized, 30 received massage aromatherapy, and 30 received massages only (Figure 1). We obtained 100% follow up and the massage was completed in all women. At trial entry, maternal characteristics were similar (Table 1). There were significant differences in intrapartum events (Table 2); the mean length of active phase was 4.05 ± 1.95 and 5.21 ± 2.52 h for Lavender aromatherapy and massage only, respectively. Also, in the second stage of labor there were significant differences (Table 2); 29 ± 10.5 min in the lavender aromatherapy group versus 42.4 ± 13.9 min (p=0.001) in massage group, respectively. However, there were no differences in mean length third stage of labor, labor onset and in the manner of rupture of amniotic sac in two groups (Table 2). There were also no differences in type of delivery between the lavender aromatherapy and massage group, and each had the same high spontaneous vaginal birth proportion (83-89%). Additionally, Apgar scores were not different for each group at 1 and 5 min.

The intensity of pain between the two groups was compared in the latent phase (cervix dilated 4 - 5 cm), active phase (5 - 7 cm) and transitional phase (8 - 10 cm). There was a relatively steady increase in pain intensity level as labor progressed. A t-test demonstrated that the lavender aromatherapy group had significantly lower pain reactions in the latent, active and transitional phases (Table 3). There was no different in number and duration of contractions in active phase in two groups. Twenty-seven of the 30 (90%) lavender aromatherapy group subjects reported that massage aromatherapy was helpful, providing pain relief and psychological support during labor versus 60% in massage only group (p=0.014). Subjects in the two groups (100%) tended to have a massage at the next delivery and 96.7% in lavender massage aromatherapy and 93.3% in massage group tended to continue massage during this labor and suggested it to their friends, although there was no significant difference between two groups (Table 4).

DISCUSSION

This is the first RCT to examine the exact effect of massage aromatherapy on labor pain intensity level and a wide range of intrapartum outcomes in Iran. Randomization was successful, and the baseline characteristics were similar between the two groups. No maternal adverse effects associated with lavender aromatherapy application were reported, and there were no related neonatal ill effects. The study achieved its main objective in demonstrating that lavender aromatherapy massage is effective in reliving labor pain, although, in massage only group there was a reduction in pain intensity. Data analyses

Table 1. Participant characteristics at baseline.

Parameter	Lavender massage aromatherapy n (%)	Massage n (%)	P-value
Mean maternal age (SD; years)	22.63 (3.48)	26.66 (3.67)	P=0.67
Mean gestation at delivery (SD; weeks)	39.36 (0.92)	39.5 (1.04)	P=0.18
Body mass index (BMI)	22.44 (2.55)	22.39 (2.50)	P=0.66
Prenatal care visits,	10.56 (3.01)	10.70 (3.45)	P=0.98

Table 2. Intrapartum events.

Parameter	Lavender massage aromatherapy n (%)	Massage n (%)	P-value
Mean length of active phase of labor (SD; h)	4.05 (1.95)	5.21 (2.52)	P=0.001
Mean length second stage of labor (SD; min)	29 (10.46)	42.36 (13.86)	P=0.001
Mean length third stage of labor (SD; min)	5.66 (2.66)	5.86 (2.52)	P=0.61
Labor onset			
Spontaneous (%)	13 (43.3)	13 (43.3)	P=1.0
Induced (%)	17 (56.7)	17 (56.7)	
Membrane rupture			
Spontaneous (%)	9 (30)	13 (43.3)	P=0.45
Artificial (%)	17 (56.7)	21 (70)	

Table 3. Pain intensity level in dilatation 4 - 5, 6 - 7 and 8 - 10 cm.

Parameter	Lavender massage aromatherapy		Massage	
	(n=30)	P-value	(n=30)	P-value
Pain intensity in dilation 4-5 cm (mean)				
Before intervention	4.56	P=0.0001	4.6	P=0.01
After intervention	3.20		4.2	
Pain intensity in dilation 6 - 7 cm (mean)				
Before intervention	6.83	P=0.0001	7.2	P=0.0001
After intervention	5		6.7	
Pain intensity in dilation 8-10 cm (mean)				
Before intervention	8.16	P=0.0001	7.76	P=0.05
After intervention	6.16		7.53	

Table 4. Maternal satisfaction and views about massage selection.

Parameter	Lavender massage aromatherapy n (%)	Massage n (%)	P-value
Satisfaction			
Fully satisfied	27 (90)	18 (60)	P= 0.014
Satisfied	3 (10)	12 (40)	
Massage selection			
Continue massage during this labor	29 (96.7)	28 (93.3)	
Massage selection in next delivery	30 (100)	30 (100)	P=0.66
Suggest to friends	29 (96.7)	29 (96.7)	

analysis showed that massage is effective in the first stage of labor pain. In confirmation of this, Chang et al. (2002) in their study also showed that the massage therapy is effective on pain and fear during labor. The results also showed that mean pain intensity in the first stage of labor before and after massage aromatherapy with lavender has reduced. In confirmation of this study, Burns et al. (2000) also stated that the aromatherapy is used for relief pain, nausea and vomiting and to strengthen uterine contractions in labor.

The mean pain intensity after massage in the first stage of labor was compared in two groups (Table 3). Overall increasing labor pain intensity in two groups after intervention was decreased. This drop in massage group with lavender was more dramatic than massage only group (from 8.16 to 6.16). This was probably due to the sedating effects of linalool acetate in lavender as a narcotic. In a study on 635 patients who complained of perineal pain after childbirth, six drops of pure *Lavandula* in comparison to lavender synthetic oil as daily bathroom for 10 days resulted in most patients expressing a satisfaction with lavender essence (Dale et al., 1994). In a systematic review by Smith et al. (2011) on 535 women in comparing aromatherapy with placebo for pain management of labor, there was no difference between groups for the pain intensity and the length of labor. The authors, however, concluded that further research is needed before final recommendations (Smith et al., 2011).

Conclusion

Lavender massage aromatherapy can decrease pain and duration of first and second stages of labor and it can decrease a wide range of intrapartum worst outcomes. This method can reduce the suffering of women in labor who may need to use oral or intravenous drug for relief pain, and it can also save the costs that is imposed on the health system to relief pain. Also, partners' participation in massage during labor can positively influence the quality of women's birth experiences.

ACKNOWLEDGMENTS

REFERENCES

Adams J (2006). An exploratory study of complementary and alternative medicine in hospital midwifery: models of care and professional struggle. Complement. Ther. Clin. Pract. 12(1):40-47.

Albert NM, Gillinov AM, Lytle BW, Feng J, Cwynar R, Blackstone EH (2009). A randomized trial of massage therapy after heart surgery. Heart Lung: J. Acute Critical Care 38(6):480-490.

Behiraee A (1999). Leader Textbook of midwifery. Boshra publisher, Tehran[In Persian].

Bonica JJ, Loeser JD, Chapman CR, Fordyce WE (1990). The management of pain, 2nd edn. Lea & Febiger, Philadelphia. p 2.

Burns E, Zobbi V, Panzeri D, Oskrochi R, Regalia A (2007). Aromatherapy in childbirth: a pilot randomised controlled trial. BJOG: Int. J. Obstet. Gynecol. 114(7):838-844.

Burns EE, Blamey C, Ersser SJ, Barnetson L, Lloyd AJ (2000). An investigation into the use of aromatherapy in intrapartum midwifery practice. Journal Altern. Complement. Med. 6(2):141-147.

Carroll D, Bowsher D (1993). Pain: management and nursing care. Butterworth Heinemann. Oxford, UK.

Cavanagh H, Wilkinson J (2002). Biological activities of lavender essential oil. Phytother. Res. 16(4):301-308.

Chang MY, Wang SY, Chen CH (2002). Effects of massage on pain and anxiety during labour: a randomized controlled trial in Taiwan J. Adv. Nurs. 38(1):68-73.

Clarke EB, French B, Bilodeau ML, Capasso VC, Edwards A, Empoliti J (1996). Pain management knowledge, attitudes and clinical practice: the impact of nurses' characteristics and education. J. Pain Symptom Manage. 11(1):18-31.

Cunningham FG, Leveno KJ, Bloome SL, Hauth JC, Gilstrap LC, Wenstrom KD (2005). Williams's obstetrics, 22nd ed. McGraw-Hill, New York. pp. 865-866.

Dale A, Cornwell S (1994). The role of lavender oil in relieving perineal discomfort following childbirth: a blind randomized clinical trial. Taiwan J. Adv. Nurs. 19(1):89-96.

Fellowes D, Barnes K, Wilkinson S (2004). Aromatherapy and massage for symptom relief in patients with cancer. The Cochrane Library.

Hill JB, Alexander JM, Sharma SK, McIntire DD, Leveno KJ (2003). A comparison of the effects of epidural and meperidine analgesia during labor on fetal heart rate. Obstet. Gynecol. 102(2):333.

Iran ministry of health (IMOH) (2006). Organization of Mother and Child Health [In Persian] Available from: http://www.fhp.hbi.ir.

Lee MK, Chang SB, Kang DH (2004). Effects of SP6 acupressure on labor pain and length of delivery time in women during labor. J. Altern. Complement. Med. 10(6):959-965.

Lowdermilk DL, Perry SE (2004). Maternity and Women's Health Care, 10th Ed. Mosby, St. Louis.

Mckinney ES, James SR, Murray SS, Ashwill J (2005). Maternal-Child Nursing. 2rd edition edn.

Sindhu F (1996). Are non-pharmacological nursing interven-tions for the management of pain effective? A meta-analysis, Sindhu F. 24(6):1152-1159.

Smith C, Collins C, Crowther C (2011). Aromatherapy for pain management in labour. Cochrane Database Syst. Rev. p. 7.

Volmanen P, Valanne J, Alahuhta S (2004). Breast-feeding problems after epidural analgesia for labour: A retrospective cohort study of pain, obstetrical procedures and breast-feeding practices. Int. J. Obstet. Anesth. 13(1):25-29.

Zargary A (1997). Herbal medicine. [In Persian]. Tehran. pp. 753-760.