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Aromatherapy for Laboring Women: A Meta-Analysis of Randomized Controlled Trials

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Abstract

Aromatherapy is the therapeutic use of oil from herbs, flowers, and other plants. The aim of this meta-analysis was to quantify the effectiveness of aromatherapy for laboring women. We searched five electronic databases till November 15th 2013 including those Chinese and English language articles. A total of 4 eligible studies were identified. Aromatherapy was effective in reducing the length of labor, but there were no statistically significant effects in the use of pharmacological analgesia, spontaneous vaginal delivery, caesarean delivery and assisted vaginal birth. Due to the limited number of articles identified, the evidence is not sufficiently convincing that aromatherapy is an effective therapy for laboring women.

Keywords

Aromatherapy; Laboring Women; Randomized Controlled Trials; Meta-Analysis

1. Introduction

Labor presents a physiological and psychological challenge for women [1]. Childbirth is arguably one of the most painful experiences and the most significant physical challenge for women to undergo during their lives [2]. Pain is caused by uterine contractions, cervical dilatation, and vaginal and pelvic floor stretching to accommodate the baby [1] [3]. Psychological challenges include tension, anxiety and fear, which are factors contributing towards women's perception of pain and may also affect their labor and birth experience [1].

Women increasingly use complementary therapies as a means of retaining control over their childbearing ex-

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periences and as additional choices for managing antenatal symptoms and intrapartum comfort and progress [4]. Nowadays, using alternative and complementary therapies such as essential oils in aromatherapy has been recognized in obstetrics [5]. Aromatherapy involves the use of the essential oils from herbs, flowers, and other plants [6]. The oils may be massaged into the skin, or inhaled by using a steam infusion or burner. The most common application of aromatherapy during labor is by massage, bath or inhalation [7].

Due to the increasing popularity of application of aromatherapy for laboring women, the aim of this study was to examine the effects of aromatherapy on the delivery outcomes of laboring women through systematic review and meta-analysis.

2. Methods

Five databases (Medline, CINAHL, Scopus, The Cochrane Library, and CAJ Full-text Database) were searched until November 15, 2013, and articles published in English and Chinese were included in the data sample. The search terms included "aromatherapy", "labor", "delivery", and "intrapartum midwifery practice". Eligible studies were randomized controlled trials (RCTs), eligible types of participants were women in labor, and types of interventions included the use of any type of aromatherapy for labouring women.

For each study included, data were extracted from the original paper independently by one of the main researcher and then verified by another researcher. Disagreements concerning data extraction were resolved by discussion. Trial quality was judged based on five domains: random sequence generation, allocation concealment, assessor blinding, patient blinding, and incomplete outcome data (**Table 1**). The Cochrane Collaboration's Review Manager (RevMan 5.2) was used to generate pooled estimates of effect size.

Table 1. Summary of the 4 clinical trials of aromatherapy for women in labor.

Trials	Participants	Intervention	Comparison	Main outcome	Study design	Risk of bias
Burns *et al.* [8]	513 women with a singleton pregnancy	The experimental group received aromatherapy. Modes of application included acupressure points, taper, compress, footbath, massage or birthing pool.	The control group received usual care.	Pain intensity (only aromatherapy group), assisted vaginal birth, caesarean section, use of pharmacological pain relief, spontaneous vaginal delivery, length of labour, augmentation, and perineal trauma.	RCT, Parallel	Y,Y,N,N,Y
Calvert *et al.* [9]	22 multiparous women with a singleton pregnancy. Women were recruited during the antenatal period	The experimental group received essential oil of ginger for the bath at least 1 hour.	The control group received essential oil of lemon grass for the bath at least 1 hour.	Pain intensity (only aromatherapy group), assisted vaginal birth, caesarean section, use of pharmacological pain relief, spontaneous vaginal delivery, length of first and second stage of labour, frequency of contractions, and cervical dilatation.	RCT, double-blind	Y,Y,Y,Y,Y
Vakilian & Keramat [10]	120 primiparous women planning a vaginal delivery	Essential oil of lavender with breathing technique via nebuliser during contractions in the active phase of labour	Breathing techniques without aromatherapy	Duration of the first phase and the second stage of labour.	RCT, single blinded	Y,Y,N,N,Y
Zahra & Leila [11]	60 primiparous women planning a normal delivery	Aromatherapy massage with Lavender oil	Receiving massage only	Pain, duration of the first phase and the second & third stages of labour.	RCT	Y,Y,N,N,Y

Risk of bias (sequence generation, allocation concealment, assessor blinding, patient blinding, description of incomplete outcome data); Y, Yes; N, No; RCT, Randomized Controlled Trial.

3. Results

3.1. Description of Included Studies

A total of 4 RCTs were included in this review. The selection of studies is shown in **Figure 1**. Of these 4 trials, one trial [8] compared aromatherapy intervention with usual care. Three [9]-[11] adopted aromatherapy as study interventions, and used other active interventions including other types of aromatherapy, breathing techniques and massage as control. The characteristics of these 4 trials are summarized in **Table 1**.

3.2. Effects of Aromatherapy Intervention

Four RCTs with a total of 715 subjects included in this review, these 4 studies reported enough data to generate pooled estimates of effect size of aromatherapy for the delivery outcomes of laboring women.

3.2.1. Effects on Using of Pharmacological Analgesia

Two studies [8] [9] examined the effects of aromatherapy on the use of epidural analgesia among laboring women. **Graph 1** shows that there was no difference seen between the aromatherapy group and the control group in their use of epidural analgesia (Risk Ratio – RR = 0.97, 95% CI = 0.14 to 6.57, two trials, 535 subjects).

3.2.2. Effects on Spontaneous Vaginal Delivery

Two studies [8] [9] examined the effects of aromatherapy on the rate of spontaneous vaginal delivery among laboring women. From **Graph 2**, there was no difference in vaginal delivery between the aromatherapy group and the control group (RR = 1.00, 95% CI = 0.94 to 1.06, two trials, 535 subjects).

3.2.3. Effects on Assisted Vaginal Birth

Two studies [8] [9] examined the effects of aromatherapy on the rate of assisted vaginal birth among laboring women. From **Graph 3**, there was no difference with assisted vaginal birth between the aromatherapy group and the control group (RR = 1.03, 95% CI 0.48 to 2.17, two trials, 535 subjects).

3.2.4. Effects on Caesarean Delivery

Two studies [8] [9] examined the effects of aromatherapy on the rate of caesarean delivery among laboring women. From **Graph 4**, there was no difference in caesarean section between the aromatherapy group and the control group (RR = 1.02, 95% CI 0.53 to 1.99, two trials, 535 subjects).

3.2.5. Effects on Length of Labor

From **Graph 5**, there were statistically significant differences in reduction of labor length. For the active phase of labor (Weighted Mean Difference-WMD = −1.38, 95% CI = −2.37 to −0.40, two trials, 180 subjects). For the second stage of labor, the WMD was −12.74 (95% CI = −16.46 to −9.03, two trials, 180 subjects).

Although there were no enough data for statistically pooling for estimating the effect size of aromatherapy in pain reduction, one trial found that women following aromatherapy reported reduction of pain in the latent and active phase of labor (all p values = 0.0001) [11]. This trial also reported on the outcome of satisfaction with childbirth experience and found that women in the aromatherapy group had higher level of satisfaction of childbirth experience than women in the control group (p = 0.014) [11]. There were no adverse outcomes of aromatherapy reported among these four studies.

4. Discussion

These 4 trials mainly reported the effect of aromatherapy on the physical health outcomes of laboring women. In terms of the delivery mode of aromatherapy, this study found aromatherapy was commonly delivered with massage or bath therapy. Due to the nature of aromatherapy intervention, it may be difficulty in blinding participants and intervention delivery. But no trials attempted to blind the outcome assessors to minimize the potential methodological bias. Therefore, a risk of biases might be introduced in these 4 trials.

Although there is an increasing interest in use of aromatherapy in healthcare [12], there were limited numbers of RCTs of aromatherapy for laboring women. While the use of aromatherapy indicates positive findings in re-

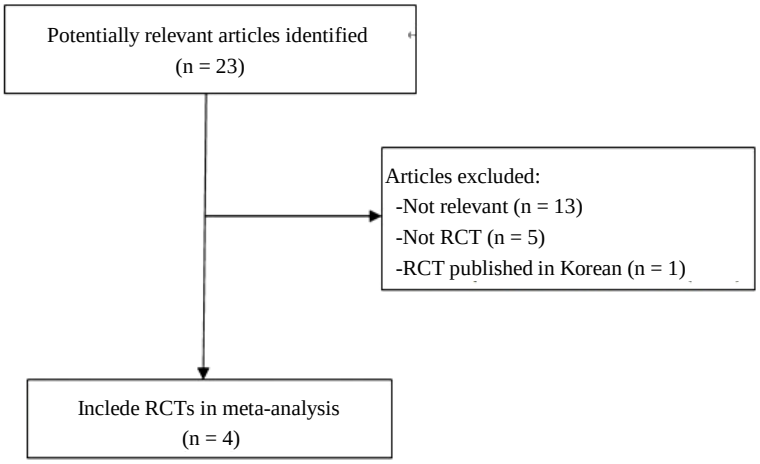
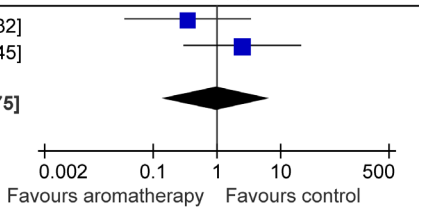


Figure 1. Flow chart of trial selection process. (RCT, Randomized Controlled Trial.)

Study or Subgroup	Aromatherapy Events	Total	Control Events	Total	Weight	Risk Ratio M-H, Random, 95% CI
Burns 2007	1	251	3	262	47.8%	0.35 [0.04, 3.32]
Calvert 2000	3	12	1	10	52.2%	2.50 [0.31, 20.45]
Total (95% CI)		**263**		**272**	**100.0%**	**0.97 [0.14, 6.75]**
Total events	4		4			

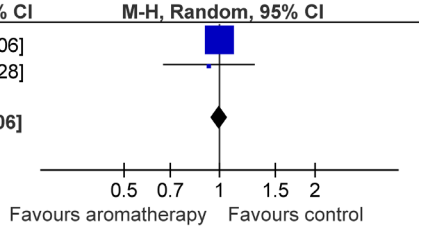
Heterogeneity: Tau² = 0.72; Chi² = 1.58, df = 1 (P = 0.21); I² = 37%
Test for overall effect: Z = 0.03 (P = 0.98)



Graph 1. Use of pharmacological analgesia.

Study or Subgroup	Aromatherapy Events	Total	Control Events	Total	Weight	Risk Ratio M-H, Random, 95% CI
Burns 2007	224	251	234	262	96.7%	1.00 [0.94, 1.06]
Calvert 2000	10	12	9	10	3.3%	0.93 [0.67, 1.28]
Total (95% CI)		**263**		**272**	**100.0%**	**1.00 [0.94, 1.06]**
Total events	234		243			

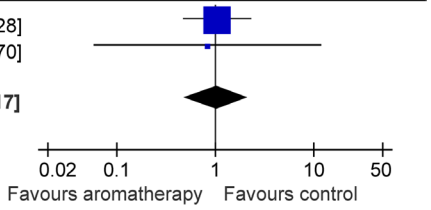
Heterogeneity: Tau² = 0.00; Chi² = 0.20, df = 1 (P = 0.65); I² = 0%
Test for overall effect: Z = 0.11 (P = 0.91)



Graph 2. Spontaneous vaginal delivery.

Study or Subgroup	Aromatherapy Events	Total	Control Events	Total	Weight	Risk Ratio M-H, Random, 95% CI
Burns 2007	12	251	12	262	92.0%	1.04 [0.48, 2.28]
Calvert 2000	1	12	1	10	8.0%	0.83 [0.06, 11.70]
Total (95% CI)		**263**		**272**	**100.0%**	**1.03 [0.48, 2.17]**
Total events	13		13			

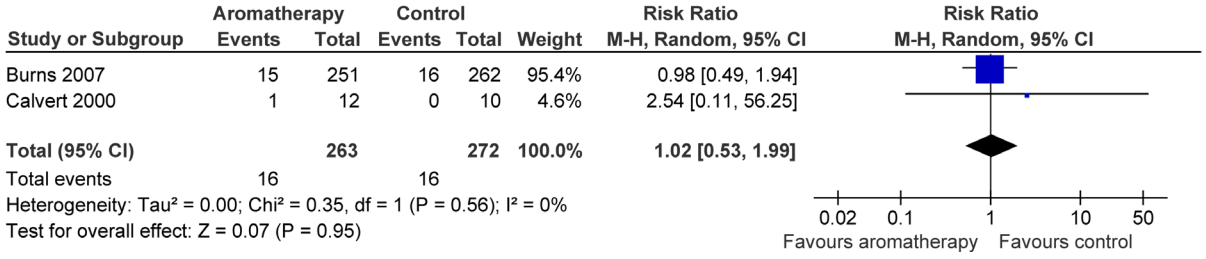
Heterogeneity: Tau² = 0.00; Chi² = 0.03, df = 1 (P = 0.87); I² = 0%
Test for overall effect: Z = 0.06 (P = 0.95)



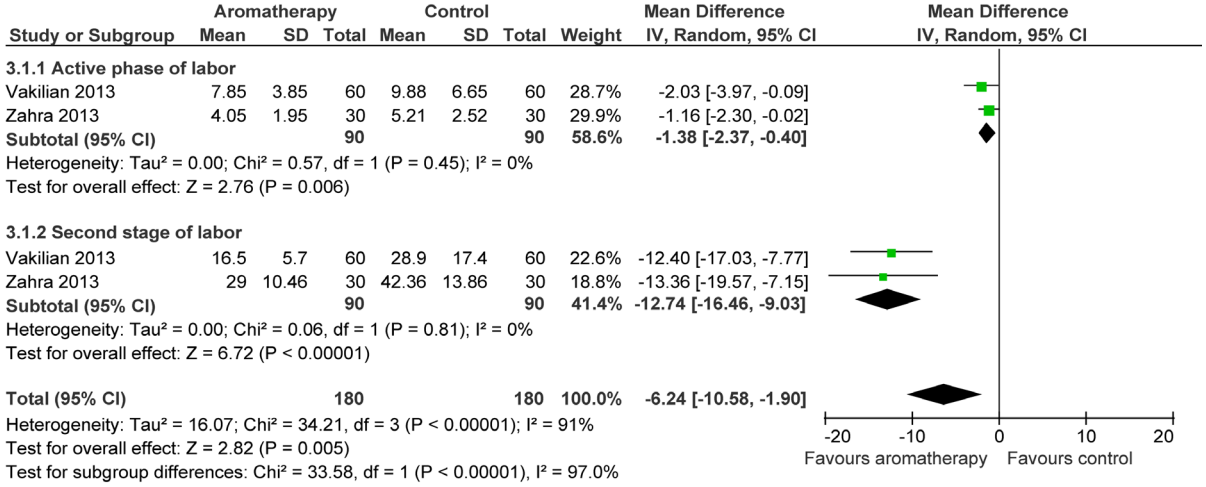
Graph 3. Assisted vaginal birth.

ducing the length of labor and pain intensity during labor, there were no statistically significant effects in other physical-related delivery outcomes such as the rates of spontaneous vaginal delivery and assisted vaginal birth.

Like most systematic reviews and meta-analyses, selective publishing and reporting bias are well-documented so that the positive effects of aromatherapy interventions may be overestimated. Of these 4 trials, only one trial had relatively large sample size. Future large scale research in aromatherapy with laboring women is recom-



Graph 4. Caesarean section.



Graph 5. Length of labor.

mended. Although only trial reported positive findings for the use of aromatherapy in satisfaction of childbirth experience with laboring women, other studies examined the effect of aromatherapy for anxiety and depression for postpartum women and found positive findings with minimal risk for the use of aromatherapy as a complementary therapy [13]. Future research should assess the effect of aromatherapy on both anxiety and depression levels among laboring women.

5. Conclusion

In conclusion, there was an increase of RCTs published in the use of aromatherapy for laboring women. Due to the existing limited number of studies, the evidence is not sufficiently convincing that aromatherapy is an effective therapy for laboring women.

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