Original Article

Effect of mint aroma on nausea, vomiting and anxiety in pregnant women

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Abstract

Aims and Objectives: Various researches reported about the association between anxiety with nausea and vomiting of pregnancy. This study was designed to determine the effect of mint aroma on nausea, vomiting, and anxiety in pregnant women. **Methods:** This quasi-experimental interventional study was carried out on 66 pregnant women, with a range from the mild to moderate nausea and vomiting of pregnancy, who were admitted to the prenatal care unit. During one week, twice a day, samples in mint and placebo groups, used mint and sesame oil, respectively. Rhodes nausea and vomiting questionnaire and state anxiety inventory scale (STAI) (Spiel Berger) was completed by all mothers before and after the intervention. **Results:** After intervention, there was a significant difference in the overall mean score of Rhodes index ($P < 0.001$), also in the severity of nausea and vomiting ($P < 0.016$) between the two groups, but not in the overall mean score and severity of maternal state anxiety (MSA). In both groups, the mean of Rhodes index score and MSA was significantly decreased after intervention ($P < 0.001$). **Conclusion:** The results showed that mint aroma can be effective in reducing nausea and vomiting of pregnancy without any effect on state anxiety.

Keywords: Anxiety, mint aroma, nausea, vomiting

Introduction

Nausea and vomiting were reported by three-fourths of pregnant women.[1] There are considerable physical and psychological effects, along with changes in women's daily activities and their relationships, social or occupational functioning in women who experience nausea and vomiting in pregnancy. Studies have been highlighted the economic burden on women and society, due to lost productivity and pay for healthcare.[2]

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A review of evidence-based management of nausea and vomiting in pregnancy found that these discomforts have a profound effect on women's health and quality of life during pregnancy, as well as a financial impact on the health-care system, and hence early recognition and management are recommended. Concern about the harmful effects of medications on fetus, some pregnant women seeks alternative therapies, but not drugs, for treatment of nausea and vomiting.[3]

The cause of nausea and vomiting during pregnancy is still unknown and wide varieties of treatment have been used empirically,[4] therefore non-pharmaceutical treatments are increasingly used to treat nausea and vomiting in pregnancy.[2,4] In a study, 34% of women did not use drug treatment (vitamin B6), 26% used them less than the prescribed dose. This was due to

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lack of trust to drug safety during pregnancy, so their preference was non-pharmacological approaches.[5]

Researches show that herbal medicines and alternative treatments are often included in common advice which offered by healthcare providers for nausea and vomiting in pregnancy.[3] Positive effect of inhalation of mixed two perfumes of lavender and Peppermint oils on nausea and vomiting in early pregnancy,[4] also effect of Peppermint aromatherapy[6] and mint extract[7], was achieved on nausea and vomiting in post C-section. However, Peppermint oil had no effect on the severity of nausea and vomiting in pregnancy.[8,9]

Various researches reported the association between anxiety with nausea and vomiting of pregnancy,[10,11] also the effect of inhalation of Peppermint aroma has been approved on the anxiety of the first stage of labor in nulliparous women.[12] Although healing ingredients of essential oils are broadly used in medicine throughout the world,[13] due to unawareness of their mechanisms of action and lack of randomized controlled trials in this field, administration of herbal medicines is limited during pregnancy. The present study has been carried out to evaluate the effect of mint aroma on nausea, vomiting and anxiety during pregnancy. It was based on hypothesis that mint aromatherapy improves nausea, vomiting and anxiety of pregnant women.

Methods

Overview of design

This study was approved by the ethics committee of Tehran University of Medical University (TUMS) from Jan 5, to April 21, 2014. This quasi-experimental study was conducted on pregnant women who were admitted to prenatal care unit of Baharloo teaching center in Tehran, Iran's capital city. All samples had mild to moderate nausea and vomiting (based on Rhodes index) and state anxiety inventory scale (STAI) less than 60. Samples had 15-34 years old with single and wanted pregnancy between 6-16 weeks gestational age. They were not included in this study if they had cold and olfactory disorders, physical, mental and emotional recognized diseases, stressful events during the past 3 months, history of allergy to herbal drugs, using anti-emetic or emetic drugs (herbal or chemical drugs) in the past 24 hours, using sedative drugs or other therapeutic measures such as vegetable oils (according to their reporting). Women were excluded if they had no willingness to continue participating in the study, crises and stressful events during the study, lack of regular use of aromatherapy (non-use of aroma during 2 consecutive or non-consecutive days). To prevent contact mothers with each other's, every other day, the samples were allocated to one of the intervention or control group. According to a throwing coin, all of the samples in the first day were placed in the placebo group and next day the mint aroma group. Until the last day, samples were assigned in the groups that in initial lottery were identified.

First, the purpose of the study was briefly explained to mothers who had the inclusion criteria, and then consent form was given to them, which was finally approved by the TUMS ethic committee. Intervention was performed on seven consecutive days. On the first day at prenatal care unit, demographic questionnaire, Rhodes nausea and vomiting questionnaire and STAI (Spielberger) was completed by mothers before intervention.

In addition to receiving the routine training on diminishing gestational nausea, such as more meals and less food per meal, refraining from eating before reaching satiety, avoiding fatty and spicy foods, eating crackers or dry bread before getting up from sleep and keeping hydration,[14] researcher explained how to perform the aromatherapy individually to mothers in the two groups. Kashan Barij Essence Company was responsible for preparing aroma. For this purpose, the essence of flowering shoots of Peppermint (Mentha piperita) was extracted and 10 percent concentration of sesame oil odorless was diluted basis. Mint and sesame oil in the bottle with the same shape and color that was marked with codes A and B was poured, thus researcher and statistician were unaware of the dividing the groups. Samples in mint and placebo groups, they orderly used mint and sesame oil twice a day (before rest in the afternoon and night sleep) for seven days.

Intervention

The pregnant women in the study groups were asked to use the solution twice a day, before rest in the afternoon and night sleep for seven days. The samples were assigned to four drops of pure mint or sesame oil dropped on the cotton, and kept in distance of 20 cm of their nose, and then breathe 20 minutes through the nose. To the mint and placebo samples were given glassy container with the same shape and color that was making with codes A and B.

Ensuring that, any abnormal sign (i.e. running nose, skin rash, itching, headache, burning eyes and abdominal pain) appeared throughout the treatment period, the treatment should be stopped and record the signs. Rhodes nausea and vomiting questionnaire was completed every night before sleeping, during the procedure by the study groups. STAI scale (Spielberger) was completed by mothers after the intervention (seventh day).

Data collected were analyzed by SPSS software version 16. Kolmogorov–Smirnov test (KS Sample) was used to assess the normality of quantitative variables. The results of this test showed that variables were normally distributed. Paired and independent sample t-tests were used to find differences within and between the two intervention and control groups. Fisher test and Chi-square test was used to compare qualitative variables.

Study instrument

Data collection included a demographic data sheet based on inclusion criteria, Rhodes nausea and vomiting index and Spielberger anxiety inventory State-Trait Anxiety Inventory (STAI).[15]

The Rhodes index was expanded to eight items. Eight 5-point self-report items measured the patient's perception of duration of nausea, frequency of nausea, distress from nausea, frequency of vomiting, amount of vomiting, distress from vomiting, frequency of retching, and distress from retching. This form arranges the eight items which describes the level of symptoms. The Likert- type scale for each item was scored from zero (indicating minimal or no symptom) to four (representing the worst symptom). The item scores were summed for a total score with a range of 0 to 32.[16] In Iranian research, its validity was confirmed by content validity, and its reliability was calculated and confirmed by Cronbach's alpha ($\alpha = 0.8$).[17]

State anxiety inventory was designed by Spielberger in 1970 and was revised in 1983. This test has two scales of state anxiety and trait anxiety. Each of these scales has 20 items with a Likert scale of 1 to 4. In the current study, the section of state anxiety was used which consists of 20 self-descriptive statements for the state anxiety scale. The state anxiety scale evaluates the woman's state of anxiety at the moment measured on a four-point Likert-type scale: no = 1, a little = 2, a lot = 3, totally = 4. Total scoring for state anxiety varies from 20 to 80 and is categorized as: mild anxiety: 20-39, moderate: 40-59, and severe: 60-80.[18] The construct validity of the state-anxiety scale was examined by testing military recruits after a stressful training program.[15] The reliability of the STAI in the Persian language was supported by a Cronbach's alpha coefficient of 0.9.[19]

Sample size calculation

In order to detect a significant difference among two groups, at least a sample of 33 subjects per group was estimated. A study with such a sample size would have a power of 80% and at confidence level 95%.

Results

From a total of 71 mothers who participated in the study, excluded cases were due to irregular use of fragrance (two mothers in each group) and one participate for using of other drugs (in control group). From 66 mothers that completed the study, findings showed no significant differences between the two groups with regard to their demographic characteristics [Table 1].

After 7 consequences days intervention, the mean scores of Rhodes index and severity of nausea and vomiting in mothers of the intervention group were significantly lower than control group [Tables 2 and 3]. In before and after comparison, the mean score of Rhodes score was significantly decreased in intervention and control groups [Table 2].

The mean scores and severity of MSA in mothers of the intervention group were not significantly lower than control group [Tables 4 and 5]. In before and after comparison, the mean score of MSA in two groups was significantly decreased [Table 4].

Table 1: Mothers' demographic characteristics in two groups

Variable		Mint oil (*n*=33)	Control (*n*=33)	*P*
Mothers' age (year)	Mean (SD)	26.97 (4.57)	28.4 (3.91)	0.229
Education (%)	<High school	5 (15.2)	7 (21.2)	0.717
	High school	21 (63.6)	21 (63.6)	
	University	7 (21.2)	5 (15.2)	
Job Status (%)	Housekeeper	31 (93.9)	30 (90.9)	1.00
	Employed	2 (6.1)	3 (9.1)	
Economic status (%)	good	7 (21.3)	6 (18.2)	0.734
	medium	18 (54.5)	21 (63.6)	
	poor	8 (24.2)	6 (18.2)	
No. of pregnancy (%)	Primigravida	18 (54.5)	15 (45.5)	0.784
	Gravida 2	8 (24.2)	9 (27.2)	
	Gravida 3	6 (18.3)	6 (18.3)	
	Gravida 4	1 (3)	3 (3)	
History of abortion (%)	One abortion	4 (12.2)	6 (18.2)	0.786
	Two abortion	1 (3)	1 (3)	
Gestational age (weeks)	Mean (SD)	10.31 (2.50)	10.64 (2.34)	0.574

Table 2: Comparison of the mean total scores of nauseas and vomiting in two groups

Groups - factors	Mint oil (*n*=33) Mean±SD	Control (*n*=33) Mean±SD	*P*
Before intervention	12.48±2.88	11.87±3.64	0.457
After intervention	6.12±2.87	9.58±4.31	<0.001
*P**	*P*<0.001	*P*<0.001	

*Statistical significance within groups

Table 3: Comparison of severity of nausea and vomiting after intervention in two groups

Groups	Mint oil (*n*=33) *n* (%)	Control (*n*=33) *n* (%)	*P*
No nausea and vomiting	1 (3)	0 (0)	0.016
Mild	24 (72.8)	14 (42.5)	
Moderate	8 (24.2)	18 (54.5)	
Severe	0 (0)	1 (3)	

Table 4: Comparison of the mean score of anxiety in two groups

Groups - factors	Mint oil (*n*=33) Mean±SD	Control (*n*=33) Mean±SD	*P*
Before intervention	44.42±6.02	43.36±6.26	1.00
After intervention	37.39±6.99	40.27±7.02	0.709
*P**	*P*<0.001	*P*<0.001	

*Statistical significance within groups

Discussion

The purpose of this study was to examine the effect of mint aroma on nausea, vomiting and anxiety in pregnant women. The results revealed that after seven consecutive days of aromatherapy the mean score of nausea and vomiting in the aromatherapy

Table 5: Comparison of severity of anxiety after intervention in two groups

Groups factors	Mint oil (*n*=33)	Control (*n*=33)	*P*
	n (%)	*n* (%)	
Mild	18 (54.5)	12 (36.4)	0.138
Moderate	15 (45.5)	21 (63.6)	
Severe	0 (0)	0 (0)	

group was significantly less than control group, although in both groups, the mean score of nausea and vomiting was significantly decreased at the last day of intervention, which can be due to the placebo effect that is seen in such studies. In one study (2013), 101 pregnant women performed inhalation aromatherapy for 3 days with a combination of essential oils of lavender and Peppermint. The Rhodes index score in the intervention group was significantly decreased compared to pre-intervention on the third day of aromatherapy.[4] Also, the period and method of aromatherapy in this study was different from ours and oil burner was used for this purpose. Different results have been achieved by studies which conducted on the effect of mint on nausea or vomiting in the first trimester of pregnancy,[8,9] during labor,[20] also after surgery.[6,21]

In one study, Peppermint inhaled aromatherapy have no effect in reducing nausea and vomiting in pregnancy that might be probably due to the small sample size used in their study,[8] also in one another mint has been ineffective on severity of nausea and vomiting during pregnancy.[9] Researchers stated that insufficient sample size and short period for aromatherapy is the reason for no achieving the perfect result.

In Burns[20] study that involved over 8000 mothers in labor, some mothers found Peppermint oil helpful in alleviating nausea or vomiting. In addition, the study by Lane *et al.*[6] suggested that inhaled Peppermint aromatherapy was effective in reducing nausea and vomiting after cesarean delivery. Results of the study by Ferruggiari *et al.*[21] showed no effect of inhaled Peppermint aromatherapy on nausea and vomiting after surgery in women. It is known that essential oils can be absorbed by the body through topical application, oral ingestion, also inhalation as the fastest, safest and simplest method.[22] Aromatherapy may be perceived as natural and therefore lower risk than medications.[23]

The effects of aromatherapy with Peppermint oil and placebo on anxiety were the same in this study. This similarity can be due to psychological impacts of intervention on pregnant women. Although in both intervention and control groups, mean score of anxiety was significantly decreased.

Research on clinical effectiveness of aromatherapy in reducing anxiety has been focused on the intervention for anxiety in pregnant women during delivery and, the results of these studies have headed to the contradictory results. In some studies, aromatherapy was effective in reducing anxiety level during labor (Burns *et al.* 2007).[24] However, the generalizability of these findings is limited due to the lack of control group in these studies. In other studies, aromatherapy including Peppermint essence,[12] reduce anxiety level during labor, also lavender, sour orange, and bergamot[25] had not significant effect in decrease anxiety during pregnancy.

Overall, there is relatively limited research evidence on the effects of aromatherapy in the early stage of pregnancy. More research is necessary to confirm these findings. In the present intervention, it was not possible to run blind experiment based on the experts' opinion.[24] To minimize the noted short coming, the essential glasses were assigned separate codes. Further study in this area is recommended, considering the poverty of research on effects of mint in reducing nausea, vomiting, and anxiety as well as its other biochemical effects on anxiety.

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Declaration of patient consent

The authors certify that they have obtained appropriate patient consent form. In the form the patients have given their consent for clinical information to be reported in the journal. The patients understand that their names and initials will not be published.

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Conflicts of interest

There are no conflicts of interest.

References

1. Cunningham FG, Leveno KJ, Bloom SL, Spong CY, Dashe JS, Hoffman BL, *et al.* Williams Obstetrics. 25th ed. McGraw-Hill; 2018.
2. Matthews A, Haas DM, O'Mathúna DP, Dowswell T, Doyle M. Interventions for nausea and vomiting in early pregnancy. Cochrane Database of Syst Rev 2014;3. Art. No.: CD007575. doi: 10.1002/14651858.CD007575.pub3.
3. Khresheh R. How women manage nausea and vomiting during pregnancy: A Jordanian study. Midwifery 2011;27:42-5.
4. Ghani RMA, Ibrahim ATA. The Effect of aromatherapy inhalation on nausea and vomiting in early pregnancy: A pilot randomized controlled trial. J Natl Sci Res 2013;3:192-205.
5. Baggley A, Navioz Y, Maltepe C, Koren G, Einarson A. Determinants of women's decision making on whether to treat nausea and vomiting of pregnancy pharmacologically. J. Midwifery Womens Health 2004;49:350-4.
6. Lane B, Cannella K, Bowen C, Copelan D, Nteff G, Barnes K, *et al.* Examination of the effectiveness of Peppermint aromatherapy on nausea in women post C-section. J Holist Nurs 2012;30:90-104.
7. ShahinfarJ, ZeraatiH, Imani Hesari Sh, Masrorniya M, Shojaei S. The effect of mint extract on the incidence and

severity of nausea and vomiting after cesarean section under spinal anesthesia: A Randomized Clinical Trial. Patient Saf Qual Improv 2017;5:482-7.

8. Pasha H, Behmanesh F, Mohsenzadeh F, Hajahmadi M, Moghadamnia AA. Study of the effect of mint oil on nausea and vomiting during pregnancy. Iran Red Crescent Med J 2012;14:727-30.
9. Joulaeerad N, Ozgoli G, Hajimehdipoor H, Ghasemi E, Salehi moghaddam F. Effect of aromatherapy with Peppermint oil on the severity of nausea and vomiting inpregnancy: A single-blind, randomized, placebo-controlled trial. J Reprod Infertil 2018;19:32-8.
10. Samuel O, Deepti V, Samuel S. Morning sickness in pregnancy loses, psychogenic stigma. Curr Psychiatry 2008;7:31-9.
11. Nikibakhsh A, Neisanisamani L, Keshavarz M, Hosseini F. Induce and severity of nausea and vomiting during pregnancy and its association with anxiety and depression in pregnant women. Iran J Nurs 2016;(101):1-11(Persian).
12. OzgoliG, Aryamanesh Z, Mojab F, AlaviMajd H. A Study of inhalation of Peppermint aroma on the pain and anxiety of the first stage of labor in nulliparous women: A randomized clinical trial. Qom Univ Med Sci J 2013;7:21-7. [Full Text in Persian]
13. Francoise R. Aromatherapy for Labor and Childbirth. [updated 2012; cited 2011]; 2012. Available from: http://www.selfgrowth.com/articles/Rapp26.htm.
14. Wills G, Forster D. Nausea and vomiting in pregnancy: What advice do midwives give? Midwifery 2008;24:390-8.
15. Spielberger C. Manual for the State-Trait Anxiety Inventory. California: Palo Alto, Consulting Psychologist Press Inc; 1983.
16. Modares M, Besharat S, Mahmoudi M. Effect of Ginger and Chamomile capsules on nausea and vomiting in pregnancy. Journal of Gorgan University of Medical Sciences 2012;14:46-51.
17. Pakniat H, Memarzadeh MR, Azh N, Mafi M, Ranjkesh F. Comparison of the effect of chamomile, Ginger and vitamin B6 on treatment of nausea and vomiting in pregnancy: A randomized clinical trial. The Iranian Journal of Obstetrics, Gynecology and Infertility 2018;21:47-54.
18. Norouzi F, Keshavarz M, SeyedFatemi N, Montazeri A. The impact of kangaroo care and music on maternal state anxiety. Complementary therapies in medicine 2013;21:468-72.
19. Afand N, Keshavarz M, Fatemi NS, Montazeri A. Effects of infant massage on state anxiety in mothers of preterm infants prior to hospital discharge. Journal of clinical nursing 2017;26:1887-92.
20. Burns E, Blamey C, Ersser SJ, Lloyd AJ, Barnetson L. The use of aromatherapy in intrapartum midwifery practice an observational study. Complementary therapies in nursing and midwifery 2000;6:33-4.
21. Ferruggiari L, Ragione B, Rich ER, Lock K. The effect of aromatherapy on postoperative nausea in women undergoing surgical procedures. J Perianesth Nurs 2012;27:246-51.
22. Lee M, Lee H, Khalil M, Lim H, Lim HJ. Aromatherapy for managing pain in primary dysmenorrhea: A systematic review of randomized placebo-controlled trials. Journal of clinical medicine 2018;7:434.
23. Mirkarimi S, Najafi L, Ghiasi M, Kamalvand A, Mahalleh H, Bahman M. Studying the effect of aromatherapy inhalation on female students' anxiety living in dormitory complex of Tehran University of Medical Sciences. International journal of pharmaceutical science and health care 2011;1:105-10.
24. Burns E, Zobbi V, Panzeri D, Oskrochi R, Regalia A. Aromatherapy in childbirth: a pilot randomised controlled trial. BJOG: An International Journal of Obstetrics and Gynaecology 2007;114:838-44.
25. Igarashi T, Fujita M. Effect of aromatherapy for self-care during pregnancy. J Nara Med Assoc 2010;61:101-11.