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The effects of clinical aromatherapy for anxiety and depression in the high risk postpartum woman – A pilot study

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A B S T R A C T

Objectives: The aim of this study was to determine if aromatherapy improves anxiety and/or depression in the high risk postpartum woman and to provide a complementary therapy tool for healthcare practitioners.
Design: The pilot study was observational with repeated measures.
Setting: Private consultation room in a Women's center of a large Indianapolis hospital.
Subjects: 28 women, 0–18 months postpartum.
Interventions: The treatment groups were randomized to either the inhalation group or the aromatherapy hand m'technique. Treatment consisted of 15 min sessions, twice a week for four consecutive weeks. An essential oil blend of rose otto and lavandula angustifolia @ 2% dilution was used in all treatments. The non-randomized control group, comprised of volunteers, was instructed to avoid aromatherapy use during the 4 week study period. Allopathic medical treatment continued for all participants.
Outcome measurements: All subjects completed the Edinburgh Postnatal Depression Scale (EPDS) and Generalized Anxiety Disorder Scale (GAD-7) at the beginning of the study. The scales were then repeated at the midway point (two weeks), and at the end of all treatments (four weeks).
Results: Analysis of Variance (ANOVA) was utilized to determine differences in EPDS and/or GAD-7 scores between the aromatherapy and control groups at baseline, midpoint and end of study. No significant differences were found between aromatherapy and control groups at baseline. The midpoint and final scores indicated that aromatherapy had significant improvements greater than the control group on both EPDS and GAD-7 scores. There were no adverse effects reported.
Conclusion: The pilot study indicates positive findings with minimal risk for the use of aromatherapy as a complementary therapy in both anxiety and depression scales with the postpartum woman. Future large scale research in aromatherapy with this population is recommended.

1. Introduction

1.1. Background

Postpartum depression lies within the category of Perinatal Mood Disorders and is defined as moderate to severe depression in a woman after she has given birth. It is the most common medical complication of childbearing.[1] Wei G et al[2] found the total rate of major and minor postpartum depression for all cultures to be 25.3%. According to Moses-Kolko et al,[3] in the perinatal woman, there is a high co-morbidity between depression and anxiety symptoms, with 10% of women developing anxiety either alone or in combination with depression.

Allopathic treatment of depression in adults is predominately prescription antidepressant medication, the most prescribed class of medication in the US for those 20–59 years of age.[4] Individual, group and support therapies are also widely used in the treatment of depression and anxiety with varying degrees of success. The postpartum woman, generally healthy, young and without medical conditions requiring medications, is often reluctant to accept a psychiatric diagnosis and prescriptions for medication. As a consequence, these women's depression and anxiety are undetected and undertreated.[5] New mothers, often fearful of pharmaceutical medications for themselves or concerns for their breast-fed infant, seek complementary alternative therapies to treat their symptoms.

Complementary therapies are widely accessed for various physical and emotional discomforts, especially among women.

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Eisenberg[6] found that 48.9% of women, mostly college educated, use some form of complementary or alternative medicine in treatment for a variety of conditions. In the 2007 statistics on Complementary Alternative Medicine (CAM) use in the United States, anxiety and depression rated in the top five conditions for self care with complementary therapies among the US population. Natural products, of which aromatherapy could be included, ranked as the #1 most popular category for CAM use.[7] Clinical Aromatherapy, a sub-specialty practiced by nurses with advanced aromatherapy education, is the therapeutic use of essentials oils to achieve measureable outcomes for a healthcare condition.[8]

1.2. Aromatherapy for anxiety and depression

Wilkinson et al.[9] studied aromatherapy massage in a large multicenter trial of cancer patients that experienced anxiety and/or depression. These patients experienced significant improvement in anxiety and/or depression for the six week randomization study, compared with those receiving usual care alone. Lee YL et al[10] reviewed sixteen randomized control trials of aromatherapy studies for anxiety symptoms. Fourteen of the sixteen studies reported positive findings as to the anxiolytic effects of aromatherapy, while the remaining two studies reported no effect of the aromatherapy toward anxiety symptoms. In these sixteen studies, lavender was the most commonly used essential oil. Yim et al[11] found a notable lack of studies on aromatherapy use for the treatment of depression or depressive symptoms. The six studies meeting their criteria suggested aromatherapy may improve the mood of patients with depressive symptoms and the team recommended continuation of aromatherapy as a complementary therapy for patients with depressive symptoms. Imura et al[12] examined the effect of aromatherapy-massage in healthy postpartum mothers. In the aromatherapy-massage group, post treatment scores significantly decreased in the Approach/Feeling toward Baby subscale. Their results suggest that aromatherapy-massage might be an effective intervention for postpartum mothers to improve physical and mental status and to facilitate mother–infant interaction.

1.3. Aromatherapy in maternity care

In Clinical Aromatherapy for Pregnancy and Childbirth, Tiran[13] states that the essential oils most consistently used for anxiety and depression are lavender, jasmine, ylang–ylang, sandalwood, bergamot and rose. Burns et al[14] conducted an eight year experimental study of 8058 women and explored the use of ten essential oils to ease pain, anxiety, nausea and enhance contractions during labor and childbirth. Overall, laboring women rated the aromatherapy as helpful, with rose and lavender essential oils as the most beneficial for anxiety. In 2008, the Burns maternity aromatherapy program was replicated by the author and a group of OB unit nurses at Community North Hospital in Indianapolis, extending the treatments through the early postpartum period. The laboring and postpartum patients were the most frequent recipients of aromatherapy (47% and 33% respectively).

The focus of this investigation grew from the results of the above mentioned studies, which suggested that further work exploring the effects of aromatherapy on anxiety and depression in the high risk postpartum woman might be beneficial.

2. Materials and methods

2.1. Materials

An essential oil blend of rose otto .25 (*Rosa damascena*, Bulgaria) and lavender .75 (*Lavandula angustifolia*, France) 2 drops of the rose/lavender blend combined with 5 ml of carrier lotion or oil to create a 2% dilution was used in all treatments. The essential oils were sourced from Arlys, Ft Lauderdale Florida, USA, which provides gas chromatography and mass spectrometry (GC/MS) analysis to validate chemical composition and purity. The carriers for the essential oil blend were unscented white lotion in the hand m'technique and jojoba oil for the inhalation blend. The blend was compounded at Wellspring pharmacy®, Indianapolis. A cosmetic cotton pad, cost effective and readily available, was infused with 8 drops of the 2% blend for the inhalation group.

3. Methods

In the study, 28 postpartum women were recruited from maternity and neonatal intensive care hospital units, lactation and postpartum support groups. Birdie Meyer, MA, RN, past president of Postpartum Support International (PSI), indicated that women frequently request initial support one year postpartum after exhausting all personal resources (Personal communication) Based on expert information, inclusion for the study was 0–18 months postpartum. The pilot study design was observational with repeated measures. Inclusion required informed consent and a questionnaire to rule out conditions that would exclude participation, such as allergies to the essential oils and inability to attend eight treatment sessions. In addition, all qualifying women had to score 10 or higher on either the Edinburgh Postnatal Depression Scale (EPDS)[15] or the Generalized Anxiety Disorder Scale (GAD-7),[16] indicating mild to moderate depression or anxiety respectively. The 10 question Edinburgh Postnatal Depression Scale (EPDS), developed in 1987, is a valuable and efficient way of identifying patients at risk for "perinatal" depression. The EPDS is easy to administer and has proven to be an effective worldwide screening tool by women's health and mental health professionals. The EPDS was found to have satisfactory sensitivity and specificity, and was also sensitive to change in the severity of depression over time. The scale can be completed in about 5 min and has a simple method of scoring.[15] The GAD-7 developed in 2006 is a useful tool with strong criterion validity for identifying probable cases of General Anxiety Disorder. The GAD-7 is a valid and efficient tool that is self administered and can be completed and scored in a few minutes.[16]

The aromatherapy treatment groups ($N = 14$, 6-inhalation and 8-dilute skin application using the hand m'technique on both hands) were randomized by picking a number 1 (inhalation) or 2 (hand m'technique) from an envelope to either the inhalation group or hand m'technique groups. The m'technique is a registered method of gentle stroking movements performed a set number of times, in a set pattern, at a set pressure and speed that never change. The technique is completely structured and reproducible, making it useful in research. (Buckle 2003)[8] The inhalation group were given a cotton pad infused with 8 drops of the 2% rose, lavender blend and instructed to inhale the blend for 15 min. One woman in the m'technique treatment group dropped out of the study after 4 treatments/2 weeks due to transportation issues, thus at the end of the study, $N = 13$ remained in the treatment group.

Treatment consisted of 15 min sessions, twice a week for four consecutive weeks. All participants repeated the EPDS and GAD-7

Table 1
Baseline, midpoint and final scores.

	Baseline scores			Midpoint scores			Final scores		
	Mean	*F*	Sig	Mean	*F*	Sig	Mean	F	Sig
Edinburgh – Control	15.9	0.02	0.80	12.3	4.50	0.04	12.1	7.00	0.01
Edinburgh – Intervention	16.1			9.2			7.1		
GAD – Control	12.4	1.10	0.31	9.3	5.00	0.03	7.3	5.80	0.02
GAD – Intervention	13.9			5.9			4.4		

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Table 2
ANOVA change scores.

		Sum of squares	df	Mean square	F	Sig.
Edinburg change mid	Between groups	135.692	2	67.846	5.941	0.008
	Within groups	285.522	25	11.421		
	Total	421.214	27			
Edinburg change end	Between groups	160.777	2	80.388	4.206	0.028
	Within groups	439.608	23	19.113		
	Total	600.385	25			
GAD change mid	Between groups	170.863	2	85.432	5.012	0.015
	Within groups	426.137	25	17.045		
	Total	597.000	27			
GAD change end	Between groups	196.587	2	98.293	5.695	0.010
	Within groups	396.952	23	17.259		
	Total	593.538	25			

Table 4
Aromatherapy combined vs control. Group statistics.

	Aromatherapy vs control	*N*	Mean	Std. deviation	Std. error mean
Edinburg change mid	1	14	3.57	3.031	0.810
	2	14	6.86	4.171	1.115
Edinburg change end	1	13	4.27	3.127	0.867
	2	13	9.04	5.285	1.466
GAD change mid	1	14	3.07	3.990	1.066
	2	14	7.93	4.160	1.112
GAD change end	1	13	4.62	3.595	0.997
	2	13	10.00	4.564	1.266

questionnaires at the midway point (two weeks), and at the end of all treatments (four weeks). The EPDS and GAD-7 scores were entered into a confidential excel data program. The nurse/aromatherapist conducted all treatments alone on weekday mornings with the mothers in the same quiet room, without conversation or children.

The non-randomized control group ($N = 14$), continued traditional medical treatment, support groups and individual therapy as needed but did not receive or use any aromatherapy for the four week period of their participation. The control group was non-randomized as women found the guidelines of time commitment and childcare for the treatment group difficult so if eligible, they volunteered for the control group in order to support the study. One woman in the control group dropped out after the midway point, thus $N = 13$ at the end if the study in the control group. They also completed the EPDS and GAD-7 questionnaires at the beginning, midway point (two weeks), and at the end of all treatments (four weeks).

Overall, 57.1% of the women had a prior history of anxiety and 64.3% had a prior history of depression. At the time of the study, 46.4% were on medication for anxiety and 57.1% were on medication for depression. All allopathic medical treatments and therapies continued for all participants throughout the study duration. They were requested to advise the author of any medication changes. All participants had access to the nurse aromatherapist for questions during the study duration.

To ensure the safety of the participants, a mental health therapist was available for the women during the study. This proved to be a prudent precaution as a few women indicated on the EPDS questionnaire that they had considered harming themselves in the previous 7–14 days. One woman demonstrated suicidal tendencies and was immediately referred to the crisis team. Another woman displayed manic behavior and was admitted to the hospital for mental health treatment. The mental health assessment protocol was an important adjunct to this study, and any follow-up work in this area should include a mental health network.

4. Results

Statistical analysis was performed using SPSS version 17.0. Descriptive statistics indicated that among the 28 subjects, the mean age was 32 (range 25–43 years, SD 4.4). The mean number of pregnancies was 1.4 (range 1–5, SD .9). The mean Edinburgh Score at baseline was 16 (range 10–25, SD 3.8) A score of 10 or greater is indicative of possible depression.[15] The mean GAD Score at baseline

Table 3
Tukey's HSD post hoc analysis. Multiple comparisons.

Dependent variable	(*I*) treatment group	(*J*) treatment group	Mean difference (*I*–*J*)	Std. error	Sig.	95% confidence interval	
						Lower bound	Upper bound
Edinburg change mid	Control rest	Inhalation	−1.491	1.498	0.586	−5.22	2.24
		Hand massage	−5.679[a]	1.649	0.006	−9.79	−1.57
	Inhalation	Control rest	1.491	1.498	0.586	−2.24	5.22
		Hand massage	−4.188	1.825	0.075	−8.73	0.36
	Hand massage	Control rest	5.679[a]	1.649	0.006	1.57	9.79
		Inhalation	4.188	1.825	0.075	−0.36	8.73
Edinburg change end	Control rest	Inhalation	−3.981	1.965	0.128	−8.90	0.94
		Hand massage	−6.031[a]	2.301	0.039	−11.79	−2.7
	Inhalation	Control rest	3.981	1.965	0.128	−0.94	8.90
		Hand massage	−2.050	2.492	0.693	−8.29	4.19
	Hand massage	Control rest	6.031[a]	2.301	.039	0.27	11.79
		Inhalation	2.050	2.492	0.693	−4.19	8.29
GAD change mid	Control rest	Inhalation	−4.304	1.830	0.067	−8.86	0.25
		Hand massage	−5.595[a]	2.015	.027	−10.61	−0.58
	Inhalation	Control rest	4.304	1.830	0.067	−0.25	8.86
		Hand massage	−1.292	2.230	0.832	−6.85	4.26
	Hand massage	Control rest	5.595[a]	2.015	0.027	0.58	10.61
		Inhalation	1.292	2.230	0.832	−4.26	6.85
GAD change end	Control rest	Inhalation	−4.760[a]	1.867	0.045	−9.43	−0.08
		Hand massage	−6.385[a]	2.186	0.020	−11.86	−0.91
	Inhalation	Control rest	4.760[a]	1.867	0.045	0.08	9.43
		Hand massage	−1.625	2.368	0.774	−7.56	4.31
	Hand massage	Control rest	6.385[a]	2.186	0.020	0.91	11.86
		Inhalation	1.625	2.368	0.774	−4.31	7.56

[a] The mean difference is significant at the 0.05 level.

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Table 5
Independent samples *t*-test.

		Levene's test for equality of variances		*t*-test for equality of means						
				t	df	Sig. (2-tailed)	Mean Difference	Std. error Difference	95% confidence interval of the difference	
		F	Sig.						Lower	Upper
Edinburg change mid	Equal variances assumed	1.963	0.173	−2.384	26	0.025	−3.286	1.378	−6.118	−0.453
	Equal variances not assumed			−2.800	24	0.010	−4.769	1.703	−8.284	−1.254
Edinburg change mid	Equal variances assumed	1.460	0.239	−2.800	24	0.010	−4.769	1.703	−8.328	−1.254
	Equal variances not assumed			−2.800	19.482	0.011	−4.769	1.703	−8.328	−1.210
GAD change mid	Equal variances assumed	0.084	0.774	−3.153	26	0.004	−4.857	1.540	−8.023	−1.691
	Equal variances not assumed			−3.153	25.955	0.004	−4.857	1.540	−8.024	−1.691
GAD change end	Equal variances assumed	1.812	0.191	−3.342	24	0.003	−5.385	1.611	−8.710	−2.059
	Equal variances not assumed			−3.342	22.751	0.003	−5.385	1.611	−8.720	−2.049

was 13 (range 4–18, SD 3.9). A score of 10 or greater on the GAD-7 represents a reasonable cut point for identifying cases of General Anxiety Disorder. Scores of 5, 10, and 15 are interpreted as representing mild, moderate, and severe levels of anxiety on the GAD-7.[16]

Analysis of Variance (ANOVA) was utilized to determine differences in Edinburgh or GAD scores between the intervention and control groups at baseline. No significant ($p < 0.05$) differences were found (Edinburgh: $F = 0.02$, $p = 0.8$; GAD: $F = 1.1$, $p = 0.3$) (Table 1). Table 1 also shows that by the midpoint of the study, the differences in mean Edinburgh and GAD scores began to show divergence. There were significant differences between intervention and control groups in both the Edinburgh ($F = 4.5$, $p = 0.04$) and GAD ($F = 5.0$, $p = 0.03$). At the end of the study period, highly significant differences in both the Edinburgh and GAD scores were sustained (Edinburgh: $F = 7.0$, $p = 0.01$; GAD: $F = 5.8$, $p = 0.02$).

In further analysis, change scores were calculated for each participant between baseline and midpoint, and baseline and final Edinburg and GAD scores. Analysis of variance was conducted to compare mean change scores between the groups. (Table 2) Tukey's HSD Post Hoc Analysis was conducted to identify significant differences between the groups. (Table 3) Highly significant differences were noted in the ANOVA at the midpoint and final scores for both the Edinburg and GAD results: Edinburg Change Midpoint ($F = 5.9$, $p = 0.008$); Edinburg Change Final ($F = 4.2$, $p = 0.028$); GAD Change Midpoint ($F = 5.0$, $p = 0.015$); GAD Change Final ($F = 5.7$, $p = 0.010$). The Edinburg and GAD results showed significant differences between the control and hand m'technique groups at both the midpoint and final scores (Edinburg midpoint mean difference = −5.7, $p = 0.006$, Edinburg final mean difference = −6.0, $p = 0.039$ and GAD midpoint mean difference = −5.6, $p = 0.027$, GAD final mean difference = −6.4, $p = 0.020$). A significant difference was also noted between control and inhalation groups on the final mean change score for the GAD (mean difference = −4.8, $p = 0.045$).

4.1. Combined aromatherapy vs. control

In order to compare overall aromatherapy intervention to control, the hand m'technique and inhalation groups were combined and compared to the control group. (Table 4) An independent samples *t*-test showed significant differences for both the Edinburg and GAD scores between the control and aromatherapy mean change scores at midline (Edinburg mean difference = −3.3, $p = 0.025$; GAD mean difference = −4.9, $p = 0.004$), and further divergence at the final measure (Edinburg mean difference = −4.8, $p = 0.010$; GAD mean difference = −5.4, $p = 0.003$). Equality of variance was established (Levine's Test Analysis $p > 0.05$ for all comparisons). (Table 5).

5. Discussion

The study design used two separate aromatherapy interventions, inhalation and the m'technique (touch), and both intervention methods employed the same essential oil blend. Although the m'technique demonstrated a higher statistically significant difference from the control group than the inhalation technique, both aromatherapy methods showed improvement. Since the final GAD mean score for inhalation showed a significant difference from the control group, this suggests the inhalation technique may require longer or more frequent exposure to enact a positive cumulative effect upon anxiety.

If future studies are conducted, it is recommended to have larger sample sizes with more frequent treatments (4 times per week). In addition to the population in this study, the author recommends conducting aromatherapy studies for those diagnosed with anxiety and/or depression in the general population.

6. Conclusion

The pilot study indicates positive findings for the use of aromatherapy as an adjunct to, but not a replacement of, allopathic care for both anxiety and depression with the high risk postpartum woman. Limiting factors in this study were the non-randomized control group and small sample size; however, due to the positive findings, future large scale research is recommended.

Conflict of interest statement

No competing financial interests exist.

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