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"A COMPARATIVE STUDY TO ASSESS THE AROMATHERAPEUTIC EFFECTS OF ORANGE AND LAVANDULA ESSENTIAL OILS ON ANXIETY AND PHYSIOLOGICAL INDICATORS IN PATIENTS UNDERGOING CORONARY ANGIOGRAPHY AT PRIVATE HOSPITAL, KANPUR, UTTAR PRADESH, INDIA"

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Abstract

Background: Anxiety is one of the common complications resulting from invasive diagnostic methods, especially coronary angiography. It affects physiological responses of the patient vital signs in the angiography suite. Aromatherapy has suggested to reduce anxiety.

Objectives: In this regard, the present study aimed at comparing the effects of orange and Lavandula essential oils on anxiety and physiological parameters of patients undergoing coronary angiography.

Methods: This clinical trial was performed on 101 patients undergoing coronary angiography who were admitted at private hospital, Kanpur, Uttar Pradesh, India in 2018. Convenience sampling was done and the subjects were randomly divided into three groups, including the control, Lavandula and orange groups. Data collection was done using a demographic and disease questionnaire, Spielberger's state-trait anxiety inventory (STAI), a sheet to record physiological variations, a barometer and a second timer. The obtained data were analyzed by SPSS 22 using chi-square test, Fisher's exact test, one-way ANOVA, paired t-test, Tukey's post-hoc test, Kruskal-Walli's test, paired Wilcoxon test and Mann-Whitney U test.

Results: The results indicated a significant difference in the mean anxiety score between the Lavandula and control groups as well as the orange and control groups ($P < 0.001$); a significant difference was also observed between the orange and Lavandula groups after the intervention ($P < 0.001$). Furthermore, systolic blood pressure, pulse rate and respiration rate decreased significantly in subjects exposed to the Lavandula and orange essential oils compared to the control group ($P < 0.001$).

Conclusions: According to the findings, orange and Lavandula aromatherapy could relieve anxiety in patients undergoing angiography. Accordingly, this intervention can be adopted as an effective measure in anxiety-ridden situations, like diagnostic procedures.

Keywords: *Aromatherapy, Lavandula, Citrus Sinensis, Anxiety, Angiography, Physiological Indicators*

Background

Cardiovascular disease (CVD) has been one of the most critical issues in recent years and has been announced as the modern-day epidemic by the World Health Organization (1). CVD has considered to be the leading cause of mortality in India and worldwide. Given its high prevalence, many tests are used to diagnose coronary artery disease (CAD), among which angiography is one of standard procedures. According to the statistics reported in 2009, 99.2% of patients referring for the coronary angiography who were admitted at private hospital, Uttar Pradesh, and underwent angiography. Angiography is an invasive diagnostic method leading to anxiety and fear in patients. Studies have also shown that more than 72% of patients have experienced anxiety before coronary angiography. Pranav shuwalka et al. reported that angiography is the major source of stress and anxiety, which play affect the patient to accept or reject this diagnostic procedure (8). Anxiety can lead to arrhythmia due to the increased sympathetic nerve activity; besides, by increasing arterial responsiveness, heart rate and blood pressure, it results in tissue damage and platelet aggregation. Following anxiety, physiological responses, such as blood pressure, heart rate and respiration rate are increased. As a result, these changes in a defective cycle cause cardiac ischemia and cardiac pain, which make patient at risk during angiography. Several drugs, including oxazepam and promethazine have been proposed to prevent and treat anxiety. Despite of their widespread prescription, these drugs are associated with side effects, such as dizziness, confusion, drowsiness, fatigue, etc. Due to the occasionally serious complications, pharmacotherapy is not widely used. Considering the popularity of complementary therapies for treatment of chronic diseases and their fewer side effects compared to drug therapies, they can also administer such beneficial effects during angiography.

Statement of the Problem:

A comparative study to assess the aroma therapeutic effects of orange and Lavandula essential oils on anxiety and physiological indicators in patients undergoing coronary angiography at private hospital, Kanpur Uttar Pradesh, India

Objectives

Therefore, due to the positive impact of aromatherapy on allaying anxiety in other countries, it seems that it can be used in India as a non-pharmacological method to relieve anxiety in patients undergoing coronary angiography. In this regard, the present study was performed to compare the effect of orange and Lavandula essential oils on mitigating anxiety in patients undergoing coronary angiography.

Methodology

Following the approval of the private hospital, Kanpur, this clinical trial was carried out on 105 patients under- going coronary angiography in the private hospital, Kanpur, Uttar Pradesh, India in 2018. The inclusion criteria included complete vigilance, anxiety score of greater than 80 (based on the Spielberger's scale), those undergoing coronary angiography for the first time, no history of invasive procedures before angiography, no use of sedative medications or other medicines, such as herbal essential oils six weeks before the intervention, no history of chronic obstructive pulmonary disease and those who were not studying medicine or psychology. On the other hand, the exclusion criteria were the occurrence of sudden severe changes in vital signs, cardiac dysrhythmia and unwillingness to continue participating in the study. Based on the pilot study, 105 subjects were selected using convenience sampling and the following formula, as well.

Results

In cases with normal distribution (anxiety), one-way ANOVA was used to compare the groups before and after the intervention and Tukey's post hoc test was applied for intragroup comparisons.

In contrast, for variables with no normal distribution (age, pulse rate, respiration rate and systolic and diastolic blood pressure), Kruskal-Walli's test was used to assess differences between groups and the paired Wilcoxon test was employed for intragroup comparisons. In addition, Mann- Whitney U test was used to determine significant differences between groups.

The three groups (n = 35) were subjected to the pre-test. Four patients were excluded through the study. Two patients in the control group were excluded due to the chest pain and using analgesic medications and in the Lavandula group, one person failed to complete the questionnaire and another subject withdrew from the study. Accordingly, the control and Lavandula groups contained 33 subjects and no exclusion was experienced by the orange group (n = 35). The mean age of patients was 58.8 ± 6.40 years. The majority of subjects were female (56.4%) and married (77.2%). Moreover, 46.5% of the samples were illiterate and 89.1% had no underlying disease. The results exhibited no statistically significant difference between three groups in terms of demographic characteristics (Table 1).

Due to the normal distribution of anxiety scores, the results of ANOVA test showed no significant difference between the control, Lavandula and orange groups before the intervention. However, the mean score of anxiety significantly differed between these groups after the intervention. The results of Tukey's post hoc test indicated statistically significant differences between the control and Lavandula groups, the control and orange groups as well as the Lavandula and orange groups (Table 2). Physiological variables (pulse rate, respiration rate and systolic and diastolic blood pressure) were not normally distributed, so the results of Kruskal-Wallis nonparametric test showed significant differences between three groups in

terms of pulse rate, respiration rate and systolic blood pressure after the intervention. Similarly, the results of Tukey's post hoc test demonstrated significant differences between the control group and two intervention groups in pulse rate, respiration rate and systolic blood pressure (Table 3).

Table 1 The results exhibited no statistically significant difference between three groups in terms of demographic characteristics

Characteristics	Lavandula (N = 33)	Orange (N = 35)	Control (N = 33)	P Value
Gender				0.451[a]
Male	12 ± 36.4	18 ± 51.4	14 ± 42.4	
Female	21 ± 63.6	17 ± 48.6	19 ± 57.6	
Marital status**				0.298[b]
Single	3 ± 9.1	1 ± 2.9	2 ± 6.1	
Married	22 ± 66.7	31 ± 88.6	25 ± 75.8	
Other	8 ± 24.2	3 ± 8.6	6 ± 18.2	
Education				0.554[b]
Illiterate	16 ± 48.5	14 ± 40.0	17 ± 51.5	
Primary school	10 ± 30.3	10 ± 28.6	7 ± 21.2	
High school	5 ± 15.2	10 ± 28.6	5 ± 15.2	
Academic education	2 ± 6.1	1 ± 2.9	4 ± 12.1	
Disease history				0.783[b]
Yes	5 ± 15.2	3 ± 8.6	3 ± 9.1	
No	28 ± 84.8	32 ± 91.4	30 ± 90.9	
Age, y	60.12 ± 6.79	57.80 ± 6.21	58.64 ± 6.11	0.176[c]
[a]Chi-scuare test [b]Fisher's exact	test [c]Kruskal-Walli's test			

Table 2. Comparing Anxiety and Vital Signs in the Control, Orange and Lavender Groups

Variable	Control, Mean ±SD	Lavender, Mean ±SD	Orange, Mean ±SD	PValue
Anxiety				
Beforeintervention	4.79 ±4.43	47.67 ±4.20	45.94 ±6.37	0.253[a]
Afterintervention	47.91 ±4.54	44.18 ±4.26	37.57 ±8.15	0.000[a]
Pvalue	0.716	0.000	0.000	
Pulserate				
Beforeintervention	74.0 ±5.85	74.55 ±4.85	74.20 ±3.64	0.681[b]
Afterintervention	75.06 ±3.73	70.58 ±4.30	71.26 ±3.79	0.000[b]
Pvalue	0.368	0.000	0.000	
Respirationrate				
Beforeintervention	18.27±2.60	18.61±3.17	18.86±2.13	0.105[b]
Afterintervention	18.45±3.01	19.91±0.80	20.40±1.82	0.010[b]
Pvalue	0.529	0.006	0.000	
SBP				
Beforeintervention	123.48±10.40	123.79±10.23	123.09±12.80	0.702[b]
After intervention	123.91 ±8.91	117.88 ±7.37	117.31 ±9.47	0.001[b]
Pvalue	0.501	0.000	0.000	
DBP				
Beforeintervention	77.12±6.50	77.73±6.51	77.71±8.34	0.877[b]
Afterintervention	77.61±7.59	77.58±5.61	77.86±7.89	0.891[b]
Pvalue	0.713	1.000	0.862	

Table 3. Post Hoc Test Results of Anxiety and Hemodynamic Parameters in the Three Studied Groups After the Intervention

Groups	Anxiety	Pulse Rate	RespirationRate	SystolicBP
Control-Lavandula	0.034	0.000	0.024	0.003
Control-orange	0.000	0.001	0.007	0.001
Orange-Lavandula	0.000	0.347	0.549	0.398

Tukey'spost-hoctest | Mann-WhitneyUtest

Conclusions

The findings of this study established that aromatherapy can be adopted as a complement to other therapies or even an alternative therapeutic method. This side-effect-free intervention can be used as a practical measure in anxiety-ridden situations, such as diagnostic procedures. It is proposed to be used by nurses through their complementary therapies to reduce patients' anxiety.

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