Influence of Counseling Intervention on the Effectiveness of Aromatherapy with Bergamot Oil in Healthy Women Volunteers Measured with a Brain Monitoring System

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Abstract

There is growing evidence that aromatherapy can improve mood. Since pharmacists may be requested to counsel patients about aromatherapy, this study was designed to evaluate the influence of counseling on the effectiveness of aromatherapy in 14 healthy young women. Participants completed a self-reported questionnaire (motivation, feeling of drowsiness and general fatigue) and multi-dimensional fatigue inventory-20 (MFI-20) in a room filled with the fragrance of bergamot, with or without counseling. Further, as an objective measure of changes in stress, blood flow in the inferior frontal cortex was evaluated by means of near-infrared spectroscopy (NIRS). MFI-20 showed that aromatherapy with counseling significantly improved activity and motivation, as compared to aromatherapy only. The self-reported questionnaire showed no significant difference. Regional blood flow in the inferior frontal cortex was significantly decreased by exposure to aromatherapy with counseling, compared to aromatherapy alone ($p<0.01$, $p<0.05$). The value of the laterality index (LI) derived from NIRS measurements, which is considered to be a measure of stress, was decreased by aromatherapy with counseling, indicating that bergamot oil reduces stress. Overall, the results indicated that counseling intervention markedly increased the effectiveness of aromatherapy.

Key words: aromatherapy, influence of counseling, near-infrared spectroscopy, the laterality index.

1. Introduction

Aromatherapy has been utilized in medical practice since antiquity, and continues to be widely used, especially in France, Germany and across Europe1. It is considered to be safe2,3, and is prescribed by doctors4. There have been limited investigations of its efficacy, but it has not been used much in Japan5–7.

We previously examined the effect of aromatherapy on blood flow in the inferior frontal cortex, which is related to cognitive function, using near-infrared spectroscopy (NIRS)8. Although aromatherapy appeared to improve general fatigue, and dorsolateral prefrontal cortex blood flow, there were substantial inter-individual differences. NIRS has also been used to examine the effect of stress-coping strategy in depressed patients9, who characteristically show activation of the amygdala and inactivation of prefrontal cortex. Counseling was reported to increase the effectiveness of anti-depression medication10. Further, aromatherapy with lavender improved mood and decreased stress11,12.

Here, we aimed to examine the effectiveness of counseling as a means of improving the stress-reducing efficacy of aromatherapy with bergamot oil by using a self-reported questionnaire and multi-dimensional fatigue inventory-20 (MFI-20) as subjective indicators and NIRS-evaluated blood flow in the inferior frontal cortex as an objective indicator.

This study was approved by the Keio University Faculty of Pharmacy Medical Ethics Board (permission number 120301-2), and was registered at University Hospital Medical Information Network (http://www.umin.ac.jp, registration number UMIN 000011228).

2. Methods

2–1. Aroma oil

Citrus Bergamia (Seikatsu no Ki, Lot No. 2) was used as bergamot oil. Six drops of oil were added to 80 ml of water (4% solution), and the solution was placed in a diffuser (Aroma delight, YCHO-JIN). The diffuser was run in the test room (size 73.1 m²) during the trial.

2–2. Subjects

Females from 22 to 28 years old, working in the Faculty of Pharmacy in Keio University campus, were recruited to participate. Participants who disliked the smell of bergamot were excluded. Ultimately 14 participants were selected for the study. All subjects gave prior written consent after having been informed as to the study aims, procedures, and safety and privacy issues. Average age of the 14 female participants

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