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File: ■ Lavender (*Lavandula angustifolia*)
■ Preoperative Anxiety
■ Pain

HC 101151-436

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RE: Lavender Oil Inhalation Prior to Surgery-like Setting Reduces Perceptions of Stress and Pain

Kim S, Kim H-J, Yeo J-S, Hong S-J, Lee J-M, Jeon Y. The effect of lavender oil on stress, bispectral index values, and needle insertion pain in volunteers. *J Altern Complement Med*. 2011;17(9):823-826.

Intraoperative anesthesia requirements increase when a patient has high baseline anxiety and stress. These patients also have a more difficult recovery from anesthesia. Accordingly, patients are given anxiolytic and sedative drugs before surgery, but these may delay discharge from the hospital. Aromatherapy may be able to reduce anxiety and produce sedation before a procedure. The purpose of this randomized, blinded, controlled study was to evaluate whether lavender (*Lavandula angustifolia*) oil aromatherapy could decrease stress, lower bispectral index (BIS) values (using electroencephalogram to determine level of consciousness during sedation), and reduce pain of needle insertion in a surgical setting.

Healthy subjects (n = 30; mean age = 21 years) participated in this study conducted at Kyungpook National University Hospital, Daegu, Korea. Subjects were randomly assigned into lavender treatment or control groups. Subjects arrived at the preoperative area, rested on a bed for 5 minutes, and then baseline BIS values were calculated via electrodes placed on the scalp. Next, the subjects were asked to score their stress and tension on a visual analogue scale (VAS; 0 = no stress to 10 = maximum stress). One minute later, a 25-gauge needle was inserted vertically 3 mm into the skin of the nondominant forearm and kept there for 30 seconds. The subjects rated pain intensity on a VAS (0 = no pain to 10 = worst pain imaginable).

Next, subjects in the lavender group received oxygen for 5 minutes via a face mask coated with 2 drops of 2% lavender oil, which was applied with a cotton swab to the inside of the mask. The lavender oil (100% pure lavender oil; Plantlife Natural Body Care; San Clemente, California) was diluted to 2% lavender oil with jojoba (*Simmondsia chinensis*) oil. The subjects in the control group received oxygen for 5 minutes through a face mask with no lavender oil. Immediately after receiving treatment, the subjects were transported to the operating room, and then the BIS values were measured at 5, 10, 15,

20, and 25 minutes after inhalation therapy. The subjects scored their stress level 6 minutes after inhalation treatment, and 1 minute later, a needle was inserted similar to baseline. The subjects rated pain intensity from 0 to 10. Adverse effects were recorded.

At baseline, both groups had similar levels of stress, pain intensity at needle insertion, and BIS values. Lavender oil significantly reduced the stress level ($P < 0.001$) and pain intensity ($P < 0.001$) compared with control. BIS levels at 5, 10, 15, and 20 minutes after aromatherapy inhalation were significantly lower than after control ($P < 0.001$ for all). There was no between-group difference in BIS 25 minutes after therapy. No adverse effects were reported.

The authors conclude that lavender inhalation significantly reduces BIS values, stress levels, and pain intensity of needle insertion. The exact mechanism of action is unknown. The advantage of aromatherapy with lavender oil is that it can be easily applied, it is safe, has a low cost, and can improve patient satisfaction. Aromatherapy may be helpful in controlling preoperative stress and fear. Although not assessed here, the findings may extend to the outpatient setting where patients need to give blood. Imagine entering a phlebotomist's office scented with lavender oil; perhaps the scent would decrease pain intensity and stress. The appropriate dose and efficacy would need to be assessed.

—Heather S. Oliff, PhD

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