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File: ■ Clary Sage (*Salvia sclarea*) Essential Oil
■ Lavender (*Lavandula angustifolia*) Essential Oil
■ Blood Pressure
■ Incontinence

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RE: Clary Sage Essential Oil, but Not Lavender Essential Oil, Reduces Stress during Urodynamic Examinations

Seol GH, Lee YH, Kang P, You JH, Park M, Min SS. Randomized controlled trial for *Salvia sclarea* or *Lavandula angustifolia*: Differential effects on blood pressure in female patients with urinary incontinence undergoing urodynamic examination. *J Altern Complement Med*. January 29, 2013; [epub ahead of print]. doi: 10.1089/acm.2012.0148.

Incontinence, or uncontrolled bladder activity, can be very disruptive; this condition in women may be due to problems in childbirth, aging, or infection, among other causes. Diagnoses of incontinence are made by utilizing urodynamic measurements (a variety of methods estimating bladder and urinary function). As this testing is intimate and can be embarrassing and uncomfortable, it can increase patient stress, interfering with the testing process.

Previous studies have reported that lavender (*Lavandula angustifolia*) essential oil promotes muscle relaxation and attenuates anxiety in vivo. Linalool, a compound found in lavender, is reported to modulate signaling upstream of muscle movement. In addition, clary sage (*Salvia sclarea*) essential oil has been shown to attenuate both depression and stress either in vivo or clinically. This double-blind, randomized, controlled trial investigated the potential effects of the inhalation of lavender, clary sage, or almond oil (control) on stress alleviation in women undergoing urodynamic assessment.

Patients (n=45) were randomly assigned to receive either 5% volume/volume lavender or clary sage essential oil in an almond (*Prunus dulcis*) carrier oil, or almond oil alone (control). Patient dropouts included n=5 from the control group and n=3 from both the lavender and clary sage groups. No reasons were given for the dropouts. This resulted in a total of n=12 for both the lavender and clary sage groups and n=10 in the control group. Included patients were diagnosed with incontinence and undergoing urodynamic examination; were >20 years of age; and had a fully functional sense of smell and no allergies to the treatments. They also were not being treated for any psychiatric disturbances, were not smokers or alcohol-drinkers, and had no chronic illnesses. If patients were "examined" longer or shorter than 1 hour, they were excluded.

Almond oil and both the clary sage and lavender essential oils (produced from flowers) were provided for the study by Aromarant Co. Ltd.; Röttingen, Germany. Compounds in both

treatment oils were detected by gas chromatography-mass spectrometry (GC-MS). Major volatile compounds of lavender oil were linalyl acetate (38.5%), linalool (33.3%), and terpinen-4-ol (2.1%). In clary sage oil, linalyl acetate (63.7%), linalool (17.7%), and α -terpineol (2.5%) were the major volatile components.

For the study, 2 ml of oils were placed on pads, and patients inhaled while pads were kept 30 cm from the nose. Inhalation continued for 60 minutes, concurrent with the urodynamic assessment. A questionnaire was used to assess stress, both physical and psychological. In addition, blood pressure, pulse, and respiratory rates were evaluated both prior to and following urodynamic assessment. Measurements of salivary cortisol were also taken at the same time of day prior to and after the urodynamic exam.

Patients (all female) were an average age of 56.2 years. Urge urinary incontinence (UUI) was diagnosed in n=6 patients, with n=13 patients suffering from stress urinary incontinence (SUI). A mix of incontinence types were found in n=15 patients. No significant differences were reported between groups for baseline stress scores, blood pressure, or pulse and respiratory rates.

As compared to baseline, the clary sage group had significantly decreased systolic blood pressure (SBP) (4.7%, 117.0 ± 12.73 mmHg vs. 111.2 ± 11.30 mmHg, $P=0.019$) after 60 minutes of inhalation. SBP of the clary sage group was also significantly less than that of the control group and the lavender group after the study ($P=0.048$ and $P=0.026$, respectively).

Additionally, diastolic blood pressure (DBP) was significantly decreased in the clary sage group from baseline (5.1%, 77.6 ± 5.18 mmHg vs. 73.6 ± 5.74 mmHg, $P<0.016$). DBP of this group was also significantly less than those in the lavender group ($P<0.034$). In comparison to the control group, respiratory rates of those in the lavender and clary sage groups were significantly less ($P=0.045$ and $P<0.01$, respectively). There were no significant differences detected in pulse rates or salivary cortisol concentrations across the study.

In summary, patients who inhaled clary sage essential oil were found to have decreases in multiple stress parameters. Also, those in the lavender group experienced decreased respiratory rates. While both contain linalyl acetate, it is detected in the largest amount in clary sage essential oil, and may act on smooth muscles in the vasculature to decrease blood pressure. The lack of effect of lavender oil may be due to its diuretic actions, which may have caused bladder sensitivity and therefore increased levels of stress during urodynamic examination. The authors also note that clary sage essential oil may be acting on dopamine pathways. Due to the limited bioactivity observed with inhalation of lavender essential oil, it is posited that this oil may not be useful for blood pressure reduction during urodynamic assessment. In conclusion, the inhalation of 5% clary sage essential oil is potentially useful in mitigating stress caused by urodynamic exams in those suffering from incontinence.

—Amy C. Keller, PhD

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