



HerbClip™

Laura Bystrom, PhD
Amy Keller, PhD

Mariann Garner-Wizard
Cheryl McCutchan, PhD

Shari Henson
Heather S Oliff, PhD

Executive Editor – Mark Blumenthal

Managing Editor – Lori Glenn

Consulting Editors – Wendy Applequist, PhD, Thomas Brendler, Lisa Anne Marshall, Allison McCutcheon, PhD, J. Erin Smith, MSc, Carrie Waterman, PhD

Assistant Editor – Tamarind Reaves

AMERICAN
BOTANICAL
COUNCIL

**File: ■ Ginger (*Zingiber officinale*, Zingiberaceae)
■ Aromatherapy
■ Chemotherapy-induced Nausea and Vomiting**

HC 101554-545

Date: May 31, 2016

RE: Ginger Aromatherapy Improves Some Quality-of-Life Parameters for Patients with Breast Cancer Suffering from Chemotherapy-induced Nausea and Vomiting

Lua PL, Salihah N, Mazlan N. Effects of inhaled ginger aromatherapy on chemotherapy-induced nausea and vomiting and health-related quality of life in women with breast cancer. *Complement Ther Med.* 2015;23(3):396-404.

Nausea and vomiting are troublesome adverse effects of breast cancer chemotherapy which may negatively affect both patient compliance and quality of life. Ginger (*Zingiber officinale*, Zingiberaceae) rhizome is used orally to treat nausea; however, it may cause heartburn, diarrhea, and mouth irritation. The authors hypothesized that ginger aromatherapy may prevent chemotherapy-induced nausea and vomiting (CINV) without the potential side effects of oral ginger. Hence, the purpose of this single-blind, randomized, crossover study was to evaluate the effect of aromatherapy with ginger essential oil in alleviating CINV in patients with breast cancer undergoing chemotherapy.

Patients (n = 75; mean age, 47 years) were recruited from December 2011 to January 2014 from oncology clinics at Hospital Sultanah Nur Zahirah in Kuala Terengganu, Terengganu, Malaysia, and Hospital Raja Perempuan Zainab II in Kota Bharu, Kelantan, Malaysia. Included patients had a normal sense of smell, were receiving chemotherapy for breast cancer, had ≥ 2 chemotherapy courses remaining, and had nausea and/or vomiting of any severity. Patients were excluded if they had any other type of cancer; were allergic to ginger, perfumes, or cosmetics; or were undergoing concurrent radiotherapy. All patients received standard CINV drugs for 6 days. In addition, they wore an aromatherapy necklace with a small bottle pendant day and night for 5 days during the period of chemotherapy (the authors do not explain why the aromatherapy was not administered for 6 days as well). The necklace pendant was 20 cm from their nose. At least 3x/day for at least 2 min, patients held the pendant just under their nose and breathed in deeply, even if they were not experiencing symptoms.

The aromatherapy pendant contained 2 drops of either ginger essential oil or placebo ginger fragrance oil (both from Take It Global Sdn Bhd; Butterworth, Penang, Malaysia). "While ginger essential oil is a naturally-occurring substance found in ginger rhizome, the fragrance oil (placebo) is a blend of aroma components that contains ginger oil extract (a concentrated product) and synthetic materials (typically the esters, aldehydes and ketones of various aromatics). Basically, both oils were identical in appearance and texture but the therapeutic

values of fragrance oil may have decreased substantially due to changes in the chemical structure of the concentrated product (extract) and mixture of synthetic components." After approximately a 2-week washout (average time between chemotherapy sessions) when the necklace was not worn, patients switched to the opposite treatment. Severity of nausea was measured with a visual analog scale. Incidence of vomiting was recorded. Health-related quality of life (HRQoL) was assessed with the European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30) at baseline and 8 days postchemotherapy. The authors do not explain why HRQoL was not assessed at the end of the aromatherapy.

A total of 60 patients completed all study visits and were included in the analysis. The majority of patients (66.6%) were in early stages of disease (stages I and II), and 86.7% of patients received highly emetogenic (having the capacity to induce vomiting) chemotherapy. There were no significant differences between groups at baseline. Blinding was 93.3% effective, with only 4 patients in each group reporting they could detect a difference between the treatments. Compliance was not reported.

There was no significant difference between groups in severity of nausea or incidence of vomiting. However, the ginger essential oil group had a significant reduction in severity of nausea over time, with the greatest effect in alleviating acute nausea on day 1 ($P = 0.040$). In regard to the HRQoL scores, there was a significant improvement from baseline with ginger essential oil in global health status ($P < 0.001$), role functioning ($P = 0.002$), fatigue ($P = 0.001$), pain ($P = 0.013$), nausea and vomiting ($P < 0.001$), appetite loss ($P < 0.001$), and constipation ($P < 0.040$). The degree of improvement in role functioning and appetite loss met the criteria for clinically relevant change (10-point variation from baseline score). No major adverse effects were reported; 1 patient withdrew due to mild dizziness on day 5 of ginger essential oil aromatherapy.

In the discussion, the authors note several points for consideration. The episodes of vomiting were low across all time points, so it is possible that the frequency of vomiting was not high enough to detect a therapeutic effect. Secondly, studies have shown that patients who have previously undergone chemotherapy are more likely to experience CINV and have increased resistance to antiemetics. The patients who received the placebo treatment first may have developed increased resistance before crossing over to the ginger treatment. In addition, the highly emetogenic chemotherapy used in this trial is associated with delayed symptoms which are less responsive to treatment. And while there were limited improvements in the objective measures, the HRQoL scores suggest that even relatively small reductions in CINV severity may translate to significant improvement in subjective outcome measures. An acknowledged limitation of the study was that the severity of nausea and vomiting before enrollment was not measured and was assumed to be equal across the groups. Also, it is possible that the "placebo" ginger fragrance had some therapeutic benefit.

The authors conclude that ginger essential oil had limited effects in reducing CINV; however, the HRQoL findings "were ... encouraging with significant improvement in several domains." They recommend that future studies include an untreated control arm (aromatherapy placebo such as water) to give a more accurate comparison and assessment of the placebo effect.

—Heather S. Oliff, PhD

The American Botanical Council has chosen not to include the original article.

The American Botanical Council provides this review as an educational service. By providing this service, ABC does not warrant that the data is accurate and correct, nor does distribution of the article constitute any endorsement of the information contained or of the views of the authors.

ABC does not authorize the copying or use of the original articles. Reproduction of the reviews is allowed on a limited basis for students, colleagues, employees and/or members. Other uses and distribution require prior approval from ABC.