



Effect of Ginger on Chemotherapy Induced Nausea and Vomiting in Breast Cancer Patients

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INTRODUCTION

Background

- Breast cancer is the 2nd leading cause of death for Canadian women, with about 25,700 new cases every year (Canadian Cancer Society, 2016).
- The development of 5-HT₃ antagonist drugs in the early 1990s greatly decreased the symptoms of nausea and vomiting, and provided patients with relief from many debilitating gastrointestinal difficulties (Boer-Dennert et al., 1997).
- However, the most common side effect of cancer treatment remains to be chemotherapy induced nausea and vomiting (henceforth abbreviated to CINV), which can adversely affect a patient's health and well-being. In fact, patients have been known to refuse potentially life-saving treatment for fear of CINV (Gill et al., 2006).
- Ginger has long-since been used to treat gastrointestinal health challenges such as nausea, vomiting, constipation and flatulence. Various compounds in ginger have been positively identified for the treatment of nausea and vomiting, particularly a natural 5-HT₃ antagonistic substance that works similarly to conventional medication by blocking a nerve signal in the gut to reduce the feeling of nausea and prevent vomiting (Boer-Dennert, 1997)
- The efficacy of ginger is most widely thought to be due to its aromatic and body-absorbent properties. Remedies of dried ginger for nausea and vomiting all contain an abundance of 6-shogaol, which is responsible for ginger's pungent "spicy" smell and flavor (Lete et al., 2016)
- Modern scientific studies seem to confirm that powdered *Zingiber officinale* is effective in treating nausea and vomiting induced by morning sickness and seasickness (Ehrlich, 2015).

Objective

The research group reviewed the literature to analyze and assess the use of ginger as an anti-nausea and antiemetic tool for women undergoing chemotherapy to treat breast cancer.

Research question

Does ginger alleviate debilitating chemotherapy-induced nausea and vomiting (CINV) in female breast cancer patients?

METHOD

Database Search: PubMed, Scopus, Cochrane

Keywords: "ginger" AND "CINV" AND "breast cancer" AND "chemotherapy" AND "antiemetics"

Results: 46 articles

Inclusion criteria:

- Published in English (N=32)
- Published after the year 2000 (N= 25)
- Peer-reviewed journal (N=23)
- Full text accessible through uOttawa library (N=23)
- 75% of patients women with breast cancer (N=9)

Exclusion criteria:

- Published in languages other than English
- Published before the year 2000
- Systematic reviews
- Studies with >75% of patients diagnosed with breast cancer

N = 9

RESULTS

| Article Author(s) | Type of Study | Population size and demographics n=? | Dose of ginger | Key Findings | Statistical Significance |
|----------------------------|--|--|---|--|--|
| Ansari et al. (2016) | RCT | 119 female patients Mean age=48.6 years | Powdered ginger 500mg BID X 3 days | In control group nausea was lower than ginger group, but vomiting was slightly higher More studies are needed | No |
| Arslan et al. (2014) | RCT | 60 females, mean age = 48.5 years | 500mg/2x per day | This dose of ginger was effective in treating CINV for women receiving anthracycline-based chemotherapy. | Yes (p > 0.05) |
| Panahi et al. (2012) | RCT | 100 females, mean age = 51.83 ± 9.18 years | Powdered ginger, 1.5g/day | Significantly lower presence of nausea 6-24hrs postchemotherapy in . No significant effects on retching or vomiting. | Yes, for nausea up to 24 hours postchemotherapy (p > 0.05) |
| Pei Lin Lua et al. (2015) | RCT (single-blind, cross-over) | 60 female patients (Asian) Mean age = 47.3 | Inhalation of ginger essential oils 3x day, 3 periods of 2 minutes x 5 days | The VAS nausea score was significantly lower after ginger essential oil inhalation compared to placebo, no significant effect of aromatherapy on vomiting. | No |
| Ryan et al. (2012) | Double blind, multicentre RCT | 576 Females and males (91% female, mean age = 53) | Ginger capsules 0.5-1.5 g BID X 6 days | Ginger supplementation between 0.5-1g/day significantly reduces chemotherapy induced nausea in cancer patients | Yes |
| Sontakke et al. (2003) | Randomized, prospective, crossover, double-blind trial | 50 cancer patients. Median age= 46, 39 female, 11 male | 2g (4 × 500 mg) ginger, 3 × 24-h periods with 21 days between sessions | Complete control of vomiting was achieved in 68% of patients with ginger | Yes (p > 0.05) |
| Thamlikitkul et al. (2016) | RCT (double blind, crossover) | 34 females | Powdered ginger, 500mg/2x per day | 500mg of ginger twice daily is safe, but posed no benefits on CINV. | No |
| Yekta et al. (2012) | RCT double blind, placebo controlled | 80 women With breast cancer | 250 mg ginger powder QID X6 days | Vomiting was significantly lower in test group Side effect included heartburn | Yes |
| Zick et al. (2009) | RCT, double blind | 129 adult cancer patients. Mean age = 55.5–58 years. Approximately 75% female | 1g or 2g giner daily x 3 days | Ginger provides no additional benefit for reduction of the prevalence or severity of acute or delayed CINV | No |

DISCUSSION

Limitations of Reviewed Studies

- The majority of studies had a questionnaire that the patients were asked to fill out about their nausea and vomiting postchemotherapy: potential self-report bias
- In the study by Pei Lin Lua et al. (2015), the severity of nausea before entering the study (from a possible previous round of chemotherapy) was not determined
- In some studies, ginger was being used combined with other medications
- Different studies all use different amounts of the active ingredient

• Many of the studies showed mixed findings around the efficacy of using different forms of ginger supplementation in the treatment of CINV in breast cancer patients

• Most of the studies reported some differences and benefits between the treatment group when compared to the placebo group, however in the majority of studies the results were not statistically significant

• Relevance of findings is important as ginger shows promise of reducing nausea and vomiting in certain studies. Furthermore, Ginger supplements appear to be well-tolerated in the studies and have few to no adverse effects

• Ginger is cost effective. Prescription anti-emetics for chemotherapy induced nausea and vomiting such as Aprepitant and Ondesartan are very expensive and have the potential to interact with other medications and cause undesirable side effects

• It is possible that some forms of ginger are more effective than others - more research needed into the actual biological mechanisms (ie. ingestion vs aromatherapy)

Limitations of Structured Literature Review

- Excluded potentially helpful meta analyses
- Only used articles written in English
- Exclusion of unpublished studies may have introduced a publication bias

CONCLUSION

- Ginger is a promising tool for reducing CINV in breast cancer patients, however studies have only confirmed its effectiveness when it is paired with other agents.
- A positive next step would be to conduct further studies on effectiveness of various doses and routes of entry of ginger.

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