Efficacy of ginger (zingiber officinale) in ameliorating chemotherapy-induced nausea and vomiting and chemotherapy-related outcomes: A systematic literature review update and meta-analysis

Crichton, Megan; Marshall, Skye; Marx, Wolfgang; Isenring, Elisabeth

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Ginger for Chemotherapy-induced nausea and vomiting?

*a systematic literature review and meta-analysis*

Megan Crichton

BHSci, MNutr&Diet, APD, PhD candidate

mcrichto@bond.edu.au

Megan Crichton¹, Skye Marshall¹, Wolfgang Marx¹,², Alexandra McCarthy³,⁴, Elizabeth Isenring¹,⁵

¹ Faculty of Health Sciences and Medicine, Bond University, Gold Coast, Queensland.
² Food and Mood Centre, IMPACT SRC, School of Medicine, Deakin University, Geelong, Victoria.
³ School of Nursing, University of Auckland, New Zealand.
⁴ Division of Cancer Services, Princess Alexandra Hospital, Brisbane, Queensland.
⁵ Department of Nutrition & Dietetics, Princess Alexandra Hospital, Brisbane, Queensland.
What’s the issue?

- Fatigue
- Loss of appetite
- Weight loss
- **Nausea + vomiting**
- Decreased QoL
- Depression
- Anxiety
- GI symptoms

• ↓ QoL
• ↓ oral intake
• Malnutrition
• Treatment cessation
• Mortality
Anti-CINV mechanisms for Ginger

Evidence for Ginger for CINV

Ginger (Zingiber officinale) and chemotherapy-induced nausea and vomiting: a systematic literature review

Wolfgang M Marx, Laisa Teleni, Alexandra L McCarthy, Luis Vitetta, Dan McKavanagh, Damien Thomson, and Elisabeth Isenring

N=7 studies
Qualitative analysis
Mixed support for use of ginger

Ginger as an Antiemetic Modality for Chemotherapy-Induced Nausea and Vomiting: A Systematic Review and Meta-Analysis

Jiyeon Lee, RN, PhD, ACNP-BC, and Heeyoung Oh, RN, PhD

N=5 studies
Meta-analysis
No significant effect of ginger

Standard recommendations for use of ginger for CINV in the clinical setting not warranted.
Study Aim

To evaluate the **efficacy** of **ginger** supplementation in the **prevention** and **management** of **CINV**.
Method

- 5 electronic databases searched
- From database inception to April 2018
- Data pooled (meta-analysis)
- Study quality assessed (Cochrane ROB Tool)
- Quality of body of evidence evaluated (GRADE)
Method – Study Characteristics

**Included**
- Any language
- Age >18 years
- Chemotherapy patients
- Intervention of ginger
- Comparator of placebo or standard care alone

**Excluded**
- Radiation
- Unable to be translated to English
- Receiving other interventions as comparator
Records identified through database searching (n=203)

Records screened title and abstract only (n=210)

Full-text papers assessed for eligibility (n=37)

Papers included in qualitative synthesis (n=18)

Papers included in meta-analysis (n=13)

Duplicates removed (n=89)
Records excluded (n=84)

Full-text papers excluded (n=19)

Additional records identified through snowballing (n=2)

Additional records identified in previous SLR (n=5)
## Results – Study Quality (Risk of Bias)

<table>
<thead>
<tr>
<th></th>
<th>Random sequence generation (selection bias)</th>
<th>Allocation concealment (selection bias)</th>
<th>Blinding of participants and personnel (performance bias)</th>
<th>Blinding of outcome assessment (detection bias)</th>
<th>Incomplete outcome data (attrition bias)</th>
<th>Selective reporting (reporting bias)</th>
<th>Other bias</th>
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<tbody>
<tr>
<td>Zick et al. 2009</td>
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<td>Shokri et al. 2017</td>
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<td>Ryan et al. 2013</td>
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<td>Li et al. 2018</td>
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<td>Koomun et al. 2017</td>
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<td>Arsalan et al. 2015</td>
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</table>
Results – Study Samples

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<table>
<thead>
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<tbody>
<tr>
<td><strong>Total No. participants</strong></td>
<td>1652</td>
</tr>
<tr>
<td><strong>Sample sizes</strong></td>
<td>20-375</td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td>64%</td>
</tr>
<tr>
<td><strong>Country</strong></td>
<td>Iran (n=6 studies), Thailand (n=4), USA (n=2), Turkey (n=2), Italy, Indonesia, China, Australia (n=1)</td>
</tr>
<tr>
<td><strong>Cancer</strong></td>
<td>Breast (n=9), lung (n=2), ovarian (n=2), other (gastrointestinal, haematological, unspecified) (n=5)</td>
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<tr>
<td><strong>CTx type</strong></td>
<td>Platinum-based (n=8); anthracycline-based (n=6); unspecified (n=4)</td>
</tr>
<tr>
<td><strong>CTx emetogenicity</strong></td>
<td>Moderate and/or high (n=8); unspecified (n=10)</td>
</tr>
<tr>
<td><strong>CTx regimen</strong></td>
<td>Single-day (n=6); unspecified (n=12)</td>
</tr>
<tr>
<td><strong>Anti-emetics</strong></td>
<td>Coticosteroid + 5-HT3 receptor antagonist (n=6); Coticosteroid + 5-HT3 receptor antagonist + other (n=7); aprepitant + 5-HT3 receptor antagonist (n=2); unspecified (n=3)</td>
</tr>
</tbody>
</table>
Results – Nausea Incidence

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Ginger Events</th>
<th>Comparative Events</th>
<th>Total</th>
<th>Total Weight</th>
<th>Odds Ratio M-H, Fixed, 95% CI</th>
<th>Odds Ratio M-H, Fixed, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpaslan 2012</td>
<td>0</td>
<td>15</td>
<td>23</td>
<td>30</td>
<td>33.2% 0.01 (0.00, 0.29)</td>
<td></td>
</tr>
<tr>
<td>Basal 2017</td>
<td>65</td>
<td>121</td>
<td>186</td>
<td>183</td>
<td>0.0% 1.11 (0.67, 1.83)</td>
<td></td>
</tr>
<tr>
<td>Fahimi 2011</td>
<td>17</td>
<td>36</td>
<td>53</td>
<td>36</td>
<td>0.0% 0.80 (0.52, 1.22)</td>
<td></td>
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<tr>
<td>Kommun 2017</td>
<td>30</td>
<td>40</td>
<td>70</td>
<td>37</td>
<td>4.1% 0.32 (0.19, 1.14)</td>
<td></td>
</tr>
<tr>
<td>Li 2018</td>
<td>46</td>
<td>71</td>
<td>117</td>
<td>69</td>
<td>0.0% 0.98 (0.49, 1.97)</td>
<td></td>
</tr>
<tr>
<td>Panahi 2012</td>
<td>16</td>
<td>37</td>
<td>53</td>
<td>41</td>
<td>24.2% 0.73 (0.30, 1.77)</td>
<td></td>
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<tr>
<td>Shahi 2017</td>
<td>8</td>
<td>20</td>
<td>28</td>
<td>29</td>
<td>14.7% 0.71 (0.23, 2.26)</td>
<td></td>
</tr>
<tr>
<td>Zick 2009</td>
<td>35</td>
<td>53</td>
<td>88</td>
<td>57</td>
<td>0.0% 1.63 (0.75, 3.53)</td>
<td></td>
</tr>
<tr>
<td>Zick 2009b</td>
<td>29</td>
<td>52</td>
<td>81</td>
<td>57</td>
<td>26.0% 1.06 (0.50, 2.25)</td>
<td></td>
</tr>
</tbody>
</table>

Total (95% CI) 124 157 100.0% 0.58 [0.36, 0.92]

Total events 53 89
Heterogeneity: Chi² = 10.05, df = 3, p = 0.02, I² = 70%
Test for overall effect: Z = 2.39 (p = 0.02)

>1g/day for any duration significantly reduced odds of overall nausea incidence by 42%.
GRADE level: very low

Any dose for >3-days duration significantly reduced odds of overall nausea incidence by 27%.
GRADE level: very low
Results – Vomiting Incidence

Any dose for >3-days duration significantly reduced odds of overall nausea by 40%.
GRADE level: low

≤1g/day for any duration significantly reduced odds of overall vomiting incidence by 30%.
GRADE level: low
Limitations

• Clinical heterogeneity
• Missing Data
• Small sample size in some studies
• Limited confidence in estimated effect
Ginger supplementation for more than 3 days may improve CINV. Existing research around dosage remains inconsistent. ...more research!

Megan Crichton | mcrichto@bond.edu.au