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

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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

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

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
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
Results – Search

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)

Additional records identified through snowballing (n=2)

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

Additional records identified in previous SLR (n=5)

Full-text papers excluded (n=19)
## Results – Study Quality (Risk of Bias)

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<td>Random sequence generation (selection bias)</td>
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<td>Allocation concealment (selection bias)</td>
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<td>Blinding of participants and personnel (performance bias)</td>
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<td>Blinding of outcome assessment (detection bias)</td>
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<tr>
<td>Incomplete outcome data (attrition bias)</td>
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<td>Selective reporting (reporting bias)</td>
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<td>Other bias</td>
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### Results – Study Samples

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<table>
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<tr>
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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>
</tr>
<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>Ginger Total</th>
<th>Comparator Events</th>
<th>Comparator Total</th>
<th>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>Alipan 2012</td>
<td>0</td>
<td>15</td>
<td>23</td>
<td>30</td>
<td>33.2%</td>
<td>0.01 [0.00, 0.99]</td>
<td></td>
</tr>
<tr>
<td>Bashir 2017</td>
<td>65</td>
<td>121</td>
<td>63</td>
<td>123</td>
<td>0.0%</td>
<td>1.11 [0.67, 1.83]</td>
<td></td>
</tr>
<tr>
<td>Fahimi 2011</td>
<td>17</td>
<td>36</td>
<td>19</td>
<td>36</td>
<td>0.0%</td>
<td>0.80 [0.32, 2.02]</td>
<td></td>
</tr>
<tr>
<td>Kommin 2017</td>
<td>30</td>
<td>40</td>
<td>37</td>
<td>41</td>
<td>0.0%</td>
<td>0.32 [0.09, 1.14]</td>
<td></td>
</tr>
<tr>
<td>Li 2018</td>
<td>46</td>
<td>71</td>
<td>45</td>
<td>69</td>
<td>0.0%</td>
<td>0.98 [0.49, 1.97]</td>
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<tr>
<td>Panahi 2012</td>
<td>16</td>
<td>37</td>
<td>21</td>
<td>41</td>
<td>24.2%</td>
<td>0.73 [0.30, 1.77]</td>
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<tr>
<td>Shabir 2017</td>
<td>8</td>
<td>20</td>
<td>14</td>
<td>29</td>
<td>14.7%</td>
<td>0.71 [0.23, 2.26]</td>
<td></td>
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<tr>
<td>Zick 2009</td>
<td>35</td>
<td>53</td>
<td>31</td>
<td>57</td>
<td>0.0%</td>
<td>1.63 [0.75, 3.53]</td>
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<tr>
<td>Zick 2009b</td>
<td>29</td>
<td>52</td>
<td>21</td>
<td>57</td>
<td>28.0%</td>
<td>1.06 [0.50, 2.25]</td>
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<tr>
<td>Total (95% CI)</td>
<td>124</td>
<td>157</td>
<td>100%</td>
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<td>0.58 [0.36, 0.92]</td>
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</table>

Total events: 533

Heterogeneity: $\chi^2 = 16.05, df = 3, \phi = 0.02; I^2 = 70$

Test for overall effect: $Z = 2.30 (P = 0.02)$

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 $>3$-days may improve CINV.
Existing research around dosage remains inconsistent.

...more research!

Megan Crichton | mcrichto@bond.edu.au