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

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Ginger for Chemotherapy-induced nausea and vomiting?

a systematic literature review and meta-analysis

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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
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)

- Additional records identified in previous SLR (n=5)

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

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

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</table>
## Results – Study Samples

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<table>
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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>
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<tr>
<td><strong>Female</strong></td>
<td>64%</td>
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<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>
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<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>
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<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

Any dose for >3-days duration significantly reduced odds of overall nausea incidence by 27%.

**GRADE level:** very low

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Ginger</th>
<th>Comparator</th>
<th>Odds Ratio M-H, Fixed, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alparshian 2012</td>
<td>0</td>
<td>15</td>
<td>0.01 [0.00, 0.29]</td>
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<tr>
<td>Basil 2017</td>
<td>65</td>
<td>131</td>
<td>1.11 [0.67, 1.83]</td>
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<tr>
<td>Fahimi 2011</td>
<td>17</td>
<td>36</td>
<td>0.80 [0.32, 2.02]</td>
</tr>
<tr>
<td>Kommun 2017</td>
<td>30</td>
<td>40</td>
<td>0.32 [0.09, 1.14]</td>
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<tr>
<td>Li 2018</td>
<td>46</td>
<td>71</td>
<td>0.98 [0.49, 1.97]</td>
</tr>
<tr>
<td>Panahi 2012</td>
<td>16</td>
<td>37</td>
<td>0.73 [0.30, 1.77]</td>
</tr>
<tr>
<td>Shukri 2017</td>
<td>8</td>
<td>20</td>
<td>0.71 [0.23, 2.26]</td>
</tr>
<tr>
<td>Zick 2009</td>
<td>35</td>
<td>53</td>
<td>1.63 [0.75, 3.53]</td>
</tr>
<tr>
<td>Zick 2009b</td>
<td>29</td>
<td>52</td>
<td>1.06 [0.50, 2.25]</td>
</tr>
</tbody>
</table>

**Total (95% CI)**
- ginger: 124
- comparator: 157
- 100.0%

**Odds Ratio M-H, Fixed, 95% CI**

- 0.58 [0.36, 0.92]

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

**Heterogeneity:** $Chi^2 = 20.05$; $df = 3$; $P = 0.02$; $I^2 = 70$

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>1g/day for any duration significantly reduced odds of overall nausea incidence by 42%.

**GRADE level:** very low

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**Total (95% CI)**
- ginger: 304
- comparator: 333
- 100.0%

**Odds Ratio M-H, Fixed, 95% CI**

- 0.73 [0.53, 1.00]

**Test for overall effect:** $Z = 1.94$ ($P = 0.05$)

**Heterogeneity:** $Chi^2 = 13.04$; $df = 5$; $P = 0.02$; $I^2 = 62$

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**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 $\geq 3$-days may improve CINV. Existing research around dosage remains inconsistent. ...more research!

Megan Crichton | mcrichto@bond.edu.au