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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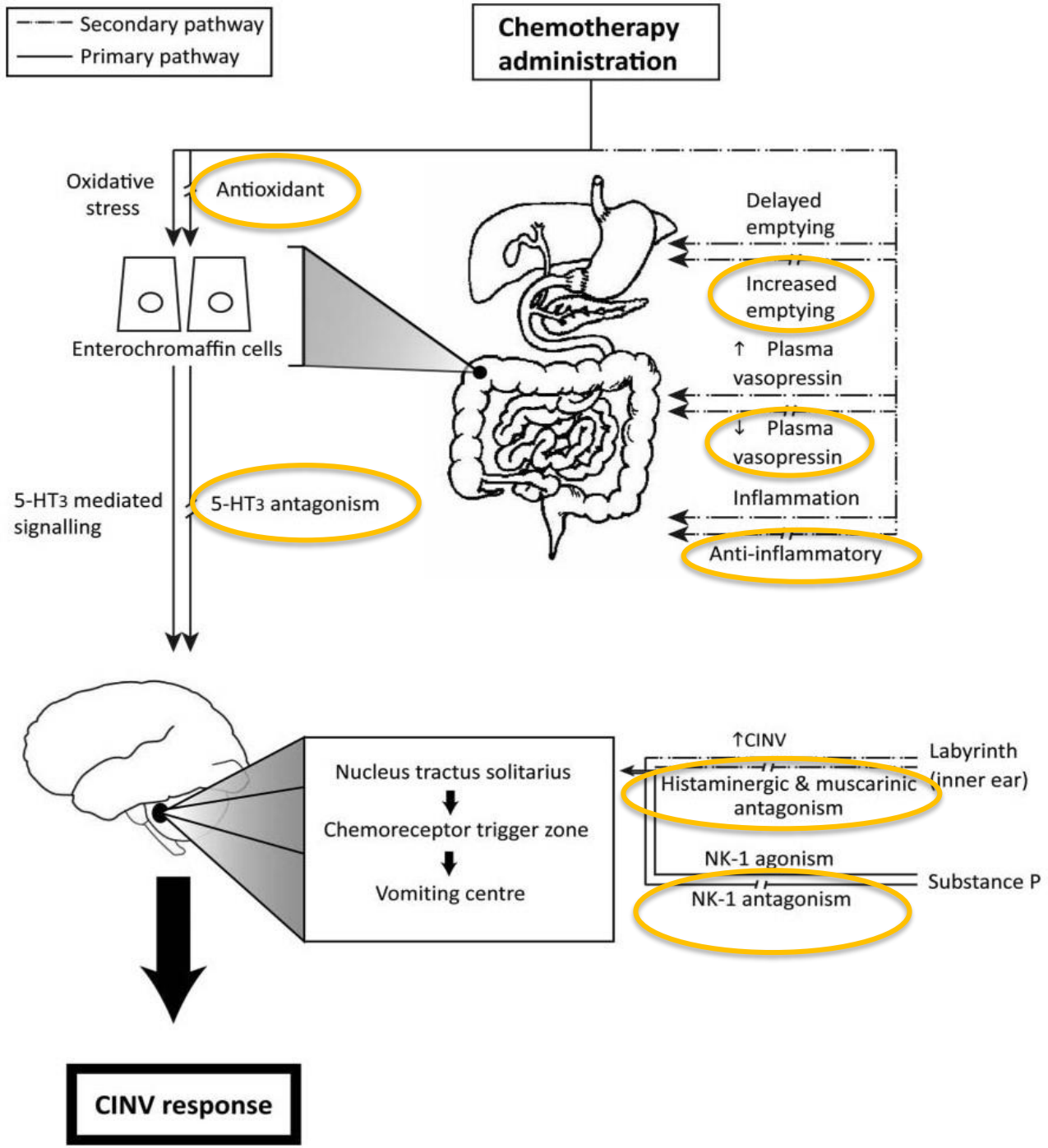
What's the issue?

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

- ↓ QoL
- ↓ oral intake
- Malnutrition
- Treatment cessation
- Mortality



Source: Marx, W., Ried, K., McCarthy, A., Vitetta, L., Sali, A., McKavanagh, D., Isenring, E. 2017. Ginger – Mechanism of action in chemotherapy-induced nausea and vomiting: a review. *Critical Reviews in Food Science and Nutrition,* 57(1), 141-146.

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

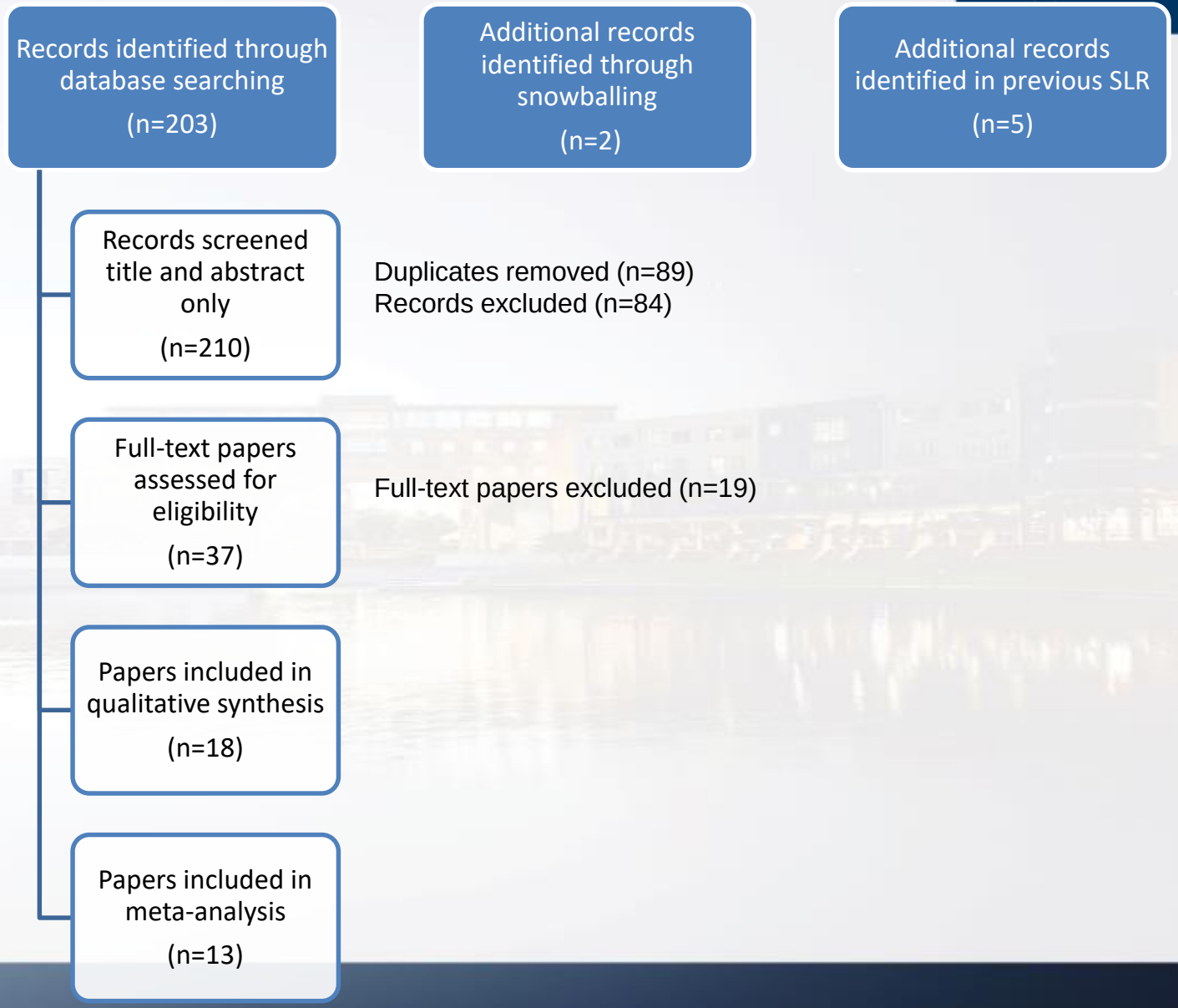
Included

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

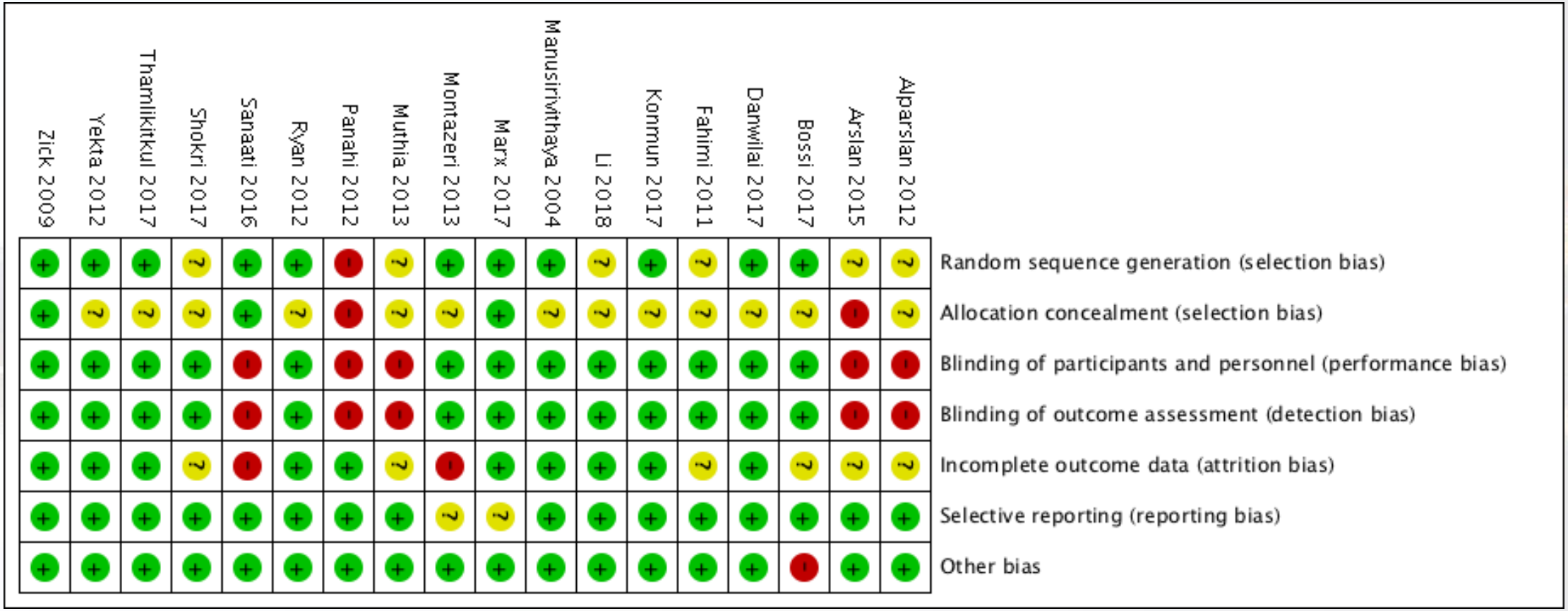
Excluded

- Radiation
- Unable to be translated to English
- Receiving other interventions as comparator

Results – Search



Results – Study Quality (Risk of Bias)



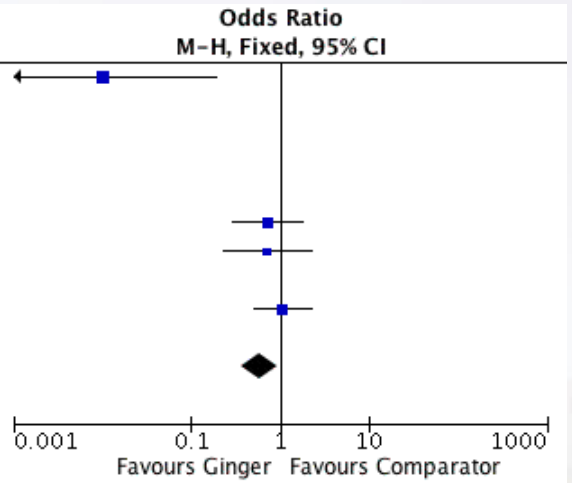
Results – Study Samples

Total No. participants	1652
Sample sizes	20-375
Female	64%
Country	Iran (n=6 studies), Thailand (n=4), USA (n=2), Turkey (n=2), Italy, Indonesia, China, Australia (n=1)
Cancer	Breast (n=9), lung (n=2), ovarian (n=2), other (gastrointestinal, haematological, unspecified) (n=5)
CTx type	Platinum-based (n=8); anthracycline-based (n=6); unspecified (n=4)
CTx emetogenicity	Moderate and/or high (n=8); unspecified (n=10)
CTx regimen	Single-day (n=6); unspecified (n=12)
Anti-emetics	Coticosteroid + 5-HT_3 receptor antagonist (n=6); Coticosteroid + 5-HT_3 receptor antagonist + other (n=7); aprepitant + 5-HT_3 receptor antagonist (n=2); unspecified (n=3)

Results – Nausea Incidence

Study or Subgroup	Ginger Events	Ginger Total	Comparator Events	Comparator Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Alparslan 2012	0	15	23	30	33.2%	0.01 [0.00, 0.19]
Bossi 2017	65	121	63	123	0.0%	1.11 [0.67, 1.83]
Fahimi 2011	17	36	19	36	0.0%	0.80 [0.32, 2.02]
Konmun 2017	30	40	37	41	0.0%	0.32 [0.09, 1.14]
Li 2018	46	71	45	69	0.0%	0.98 [0.49, 1.97]
Panahi 2012	16	37	21	41	24.2%	0.73 [0.30, 1.77]
Shokri 2017	8	20	14	29	14.7%	0.71 [0.23, 2.26]
Zick 2009	35	53	31	57	0.0%	1.63 [0.75, 3.53]
Zick 2009b	29	52	31	57	28.0%	1.06 [0.50, 2.25]
Total (95% CI)		**124**		**157**	**100.0%**	**0.58 [0.36, 0.92]**
Total events	53		89			

Heterogeneity: $Chi^2 = 10.05$, df = 3 (P = 0.02); $I^2 = 70\%$
Test for overall effect: Z = 2.30 (P = 0.02)

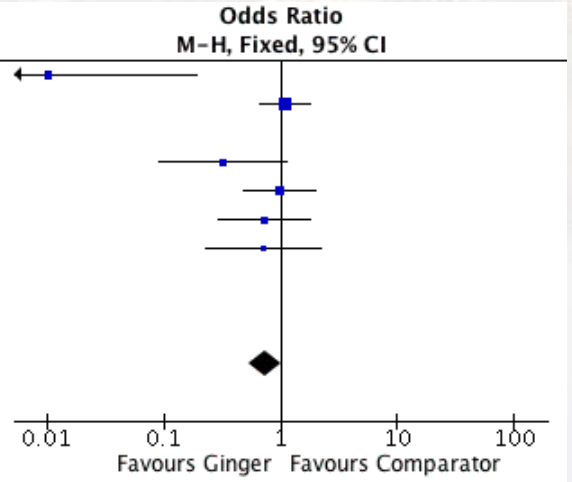


>1g/day for **any duration** significantly reduced odds of overall nausea incidence by 42%.

GRADE level: very low

Study or Subgroup	Ginger Events	Ginger Total	Comparator Events	Comparator Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Alparslan 2012	0	15	23	30	17.7%	0.01 [0.00, 0.19]
Bossi 2017	65	121	63	123	32.9%	1.11 [0.67, 1.83]
Fahimi 2011	17	36	19	36	0.0%	0.80 [0.32, 2.02]
Konmun 2017	30	40	37	41	10.4%	0.32 [0.09, 1.14]
Li 2018	46	71	45	69	18.3%	0.98 [0.49, 1.97]
Panahi 2012	16	37	21	41	12.9%	0.73 [0.30, 1.77]
Shokri 2017	8	20	14	29	7.8%	0.71 [0.23, 2.26]
Zick 2009	35	53	31	57	0.0%	1.63 [0.75, 3.53]
Zick 2009b	29	52	31	57	0.0%	1.06 [0.50, 2.25]
Total (95% CI)		**304**		**333**	**100.0%**	**0.73 [0.53, 1.00]**
Total events	165		203			

Heterogeneity: $Chi^2 = 13.04$, df = 5 (P = 0.02); $I^2 = 62\%$
Test for overall effect: Z = 1.94 (P = 0.05)



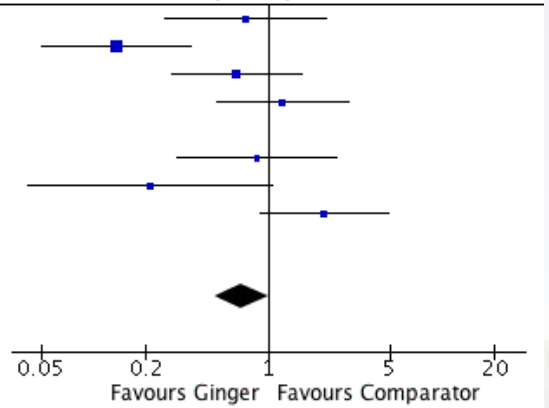
Any dose for **>3-days** duration significantly reduced odds of overall nausea incidence by 27%.

GRADE level: very low

Results – Vomiting Incidence

Study or Subgroup	Ginger Events	Ginger Total	Comparator Events	Comparator Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Fahimi 2011	26	36	28	36	10.5%	0.74 [0.25, 2.17]
Konmun 2017	9	40	28	41	29.1%	0.13 [0.05, 0.36]
Li 2018	11	71	15	69	17.4%	0.66 [0.28, 1.56]
Manusirivithaya 2004	27	43	25	43	12.6%	1.22 [0.51, 2.89]
Panahi 2012	12	37	12	41	0.0%	1.16 [0.44, 3.04]
Thamlikitkul 2017	9	34	10	34	10.0%	0.86 [0.30, 2.50]
Yekta 2012	2	40	8	40	10.3%	0.21 [0.04, 1.06]
Zick 2009	19	53	12	57	10.1%	2.10 [0.90, 4.90]
Zick 2009b	15	53	12	57	0.0%	1.48 [0.62, 3.54]
Total (95% CI)		**317**		**320**	**100.0%**	**0.70 [0.50, 1.00]**
Total events	103		126			

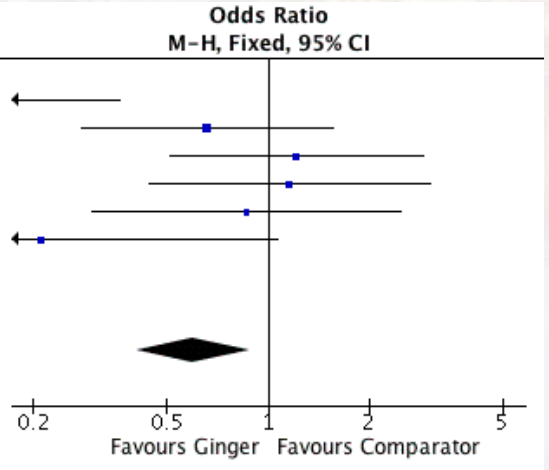
Heterogeneity: Chi² = 20.85, df = 6 (P = 0.002); I² = 71%
Test for overall effect: Z = 1.95 (P = 0.05)



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

Study or Subgroup	Ginger Events	Ginger Total	Comparator Events	Comparator Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Fahimi 2011	26	36	28	36	0.0%	0.74 [0.25, 2.17]
Konmun 2017	9	40	28	41	32.4%	0.13 [0.05, 0.36]
Li 2018	11	71	15	69	19.4%	0.66 [0.28, 1.56]
Manusirivithaya 2004	27	43	25	43	14.0%	1.22 [0.51, 2.89]
Panahi 2012	12	37	12	41	11.6%	1.16 [0.44, 3.04]
Thamlikitkul 2017	9	34	10	34	11.1%	0.86 [0.30, 2.50]
Yekta 2012	2	40	8	40	11.5%	0.21 [0.04, 1.06]
Zick 2009	19	53	12	57	0.0%	2.10 [0.90, 4.90]
Zick 2009b	15	53	12	57	0.0%	1.48 [0.62, 3.54]
Total (95% CI)		**265**		**268**	**100.0%**	**0.60 [0.40, 0.88]**
Total events	70		98			

Heterogeneity: Chi² = 15.18, df = 5 (P = 0.010); I² = 67%
Test for overall effect: Z = 2.60 (P = 0.009)



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

Limitations

- Clinical heterogeneity
- Missing Data
- Small sample size in some studies
- Limited confidence in estimated effect

Take Home Message

Ginger supplementation for **>3-days** may **improve** CINV.

Existing research around **dosage** remains **inconsistent**.

…more research!

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