Evidence Assessment: Summary of a Systematic Review

Who is this summary for?
For Doctors and Health Personnel, Administrators and Managers of health facilities, Community Health Workers and the partners involved in child health care.

Honey for acute cough in children

Key findings

- Honey probably reduces cough symptoms more than placebo and salbutamol (a drug that opens lung airways) when given for up to three days.
- Honey is probably more effective at providing cough relief and reducing the impact of cough on children's sleep at night than no treatment.
- There may be little or no difference between the effects of honey and dextromethorphan (an ingredient in over-the-counter cough remedies) or honey and bromelin with honey on all cough symptoms.

Background

Cough causes concern for parents and is a major cause of outpatient visits. Cough can impact quality of life, cause anxiety, and affects sleep in children and their parents. Honey has been used to alleviate cough symptoms. This is an update of reviews previously published in 2014, 2012, and 2010.

Questions

What is the effectiveness of honey for acute cough in children in ambulatory settings?

Honey for acute cough in children in Cameroon: In Cameroon, as in all developing countries, plants are an important source of medicine due to high costs of modern synthetic drugs offered by orthodox medicine. Results show that concoction of ground leaves with honey; concoction of juice and honey ; concoction of ground bulb with ginger rhizome in honey taken orally, treat cough[1].

[1] Focho, D. A., Nkeng, E. A. P., Fonge, B. A., Fongod, A. N., Muh, C. N., Ndam, T. W., & Afegenui, A. (2009). Diversity of plants used to treat respiratory diseases in Tubah, northwest region, Cameroon. *African Journal of pharmacy and pharmacology*, *3*(11), 573-580.

Table 1: SUMMARY OF THE SYSTEMATIC REVIEW

	What the review authors searched for	What the review authors found
Studies	Randomised controlled trials (RCTs)	Six RCTs
Participants	Children aged 12 months to 18 years with cough caused by acute viral or bacterial URTI.	899 children. The age of participants ranged from 12 months to 16 years. All studies recruited participants from paediatric outpatient clinics
Interventions	Honey alone or in combination with other products, so far as the control group recieved the same product	• Honey mixed with distilled lukewarm water • Three different types of honey: eucalyptus (family Myrtaceae), Labiatae (family Labiatae), or citrus (family Rutaceae) honeys. • Buckwheat honey. • Honey was placebo and compared to bromelin (Ananas comosus, pineapple extract) mixed with honey. • Natural honey from Kafi-Abad (a village in Yazd, Iran). • "the darkest locally available honey" (Kenya).
Controls	No treatment, placebo, honey-based cough syrup, or other over-the-counter cough medications.	Studies compared honey with dextromethorphan, diphenhydramine, salbutamol, bromelin (an enzyme from the Bromeliaceae (pineapple) family), no treatment, and placebo.
Outcomes	**Primary outcomes** 1. Duration of cough. 2. Symptomatic relief of cough (frequency of cough, reduction in severity, and less bothersome cough). **Secondary outcomes** 1. Improvement in quality of sleep at night for children (cough impact on sleep score). 2. Improvement in quality of sleep at night for caregiver (cough impact on sleep score). 3. Improvement in quality of life (e.g. school attendance and playing). 4. Adverse effects. 5. Improvement in appetite. 6. Cost of honey alone compared with other cough syrups.	**Primary outcomes** 1. Duration of cough. **2.** Symptomatic relief of cough (frequency of cough, reduction in severity, and less bothersome). **Secondary outcomes** 3. Improvement in quality of sleep at night for children (cough impact on sleep score) 4. Improvement in quality of sleep at night for caregiver (cough impact on sleep score). **5.** Adverse effects: Reported adverse events included mild reactions (nervousness, insomnia, and hyperactivity), gastrointestinal symptoms (stomachache, nausea, diarrhoea, and vomiting), rash, tachycardia, drowsiness, and somnolence.
Date of the most recent search: February 2018		
Limitations: This is a good quality systematic review**, AMSTAR = 10/11**		
Citation: Oduwole O, Udoh EE, Oyo-Ita A, Meremikwu MM. **Honey for acute cough in children**. Cochrane Database of Systematic Reviews 2018, Issue 4. Art. No.: CD007094. DOI: 10.1002/14651858.CD007094.pub5.		

Table 2: Additionnal Summary of findings

Honey compared to dextromethorphan for acute cough in children

Patient or population: acute cough in children
Setting: ambulatory
Intervention: honey
Comparison: dextromethorphan

Comparisons and outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95%CI)	No. of participants (studies)	Quality of the evidence (GRADE)
	Risk with dextromethorphan	Risk with honey			
Frequency of cough1	The mean frequency of cough (reduction in frequency of cough score) was -1.54	MD 0.07 score lower (1.07 lower to 0.94 higher)	/	149 (2 RCTs)	LOW
Severity of cough1	The mean severity of cough (reduction in severity of cough score) was -1.52	MD 0.13 score lower (1.25 lower to 0.99 higher)	/	149 (2 RCTs)	LOW

Bothersome cough1	The mean bothersome cough (reduction in bothersome nature of cough score) was -1.94	MD 0.29 score higher (0.56 lower to 1.14 higher)	/	69 (1 RCT)	MODERATE
Cough impact on children's sleep1	The mean cough impact on children's sleep (cough impact on children' sleep score) was - 1.75	MD 0.03 score higher (1.12 lower to 1.19 higher)	/	149 (2 RCTs)	LOW
Cough impact on parents' sleep1	The mean cough impact on parents' sleep (cough impact on parents' sleep score) was - 1.97	MD 0.16 score lower (0.84 lower to 0.53 higher)	/	149 (2 RCTs)	LOW

Adverse events	Population				
Nervousness, insomnia, hyperactivity	3 per 100	8 per 100 (2 to 32)	RR 2. 94 (0.74 to 11.71)	149 (2 RCTs)	LOW
Stomachache, nausea, and vomiting	1 per 100	7 per 100 (0 to 100)	RR 4. 86 (0.24 to 97.69)	69 (1 RCT)	LOW
Drowsiness	1 per 100	4 per 100 (0 to 100)	RR 2.92 (0.12 to 69.20)	69 (1 RCT)	LOW

***The risk in the intervention group** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI). **CI:** confidence interval; **MD:** mean difference; **RCT:** randomised controlled trial; **RR:** risk ratio

Additional summary of findings

Honey compared to diphenhydramine for acute cough in children

Patient or population: acute cough in children
Setting: ambulatory
Intervention: honey
Comparison: diphenhydramine

Outcomes	Outcomes Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	of participants (studies)	Certainty of the evidence (GRADE)
	Risk with diphenhydramine	**Risk with honey**			
Frequency of cough1	The mean frequency of cough (reduction in cough frequency score) was -1.73	MD 0.57 lower (0.9 lower to 0.24 lower)	/	80 (1 RCT)	LOW
Severity of cough1	The mean severity of cough (reduction in cough severity score) was -1.83	MD 0.6 lower (0.94 lower to 0.26 lower)	/	80 (1 RCT)	LOW
Cough impact on children's sleep1	The mean cough impact on children's sleep (cough impact on children' sleep score) was - 1.64	MD 0.55 score lower (0.87 lower to 0.23 lower)	/	80 (1 RCT)	LOW
Cough impact on parents' sleep1	The mean cough impact on parents' sleep (cough impact on parents' sleep score) was - 1.89	MD 0.48 lower (0.76 lower to 0.2 lower)	/	80 (1 RCT)	LOW
Adverse event: Somnolence	**Population** 8 per 100	1 per 100 (0 to 20)	RR 0.14 (0.01 to 2.68)	80 (1 RCT)	LOW

Honey compared to no treatment for acute cough in children

Patient or population: acute cough in children
Setting: ambulatory
Intervention: honey
Comparison: 'no treatment'

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	of participants (studies)	Certainty of the evidence (GRADE
	Risk with no treatment	Risk with honey			
Frequency of cough1	The mean frequency of cough (reduction in cough frequency score) was -0.98	MD 1.05 lower (1.48 lower to 0.62 lower)	/	154 (2 RCTs)	MODERATE

Severity of cough1 assessed with: 7-point Likert scale Scale from 0 to 6	The mean severity of cough (reduction in severity of cough score) was -1.13	MD 1.03 score lower (1.59 lower to 0.47 lower)	/	154 (2 RCTs)	MODERATE
Severity of cough1 assessed with: 7-point Likert scale Scale from 0 to 6	The mean severity of cough (reduction in severity of cough score) was -1.13	MD 1.03 score lower (1.59 lower to 0.47 lower)	/	154 (2 RCTs)	MODERATE
Cough impact on children's sleep1 assessed with: 7 point Likert scale Scale from 0 to 6	The mean cough impact on children's sleep (cough impact on children' sleep score) was - 1.28	MD 1.04 score lower (1.57 lower to 0.51 lower)	/	154 (2 RCTs)	MODERATE
Cough impact on parents' sleep1 assessed with: 7-point Likert scale Scale from 0 to 6	The mean cough impact on parents' sleep (cough impact on parents' sleep score) was - 1.46	MD 0.88 score lower (1.23 lower to 0.52 lower)	/	154 (2 RCTs)	MODERATE
Adverse events Population	Adverse events Population				
Nervousness, insomnia, hyperactivity	1 per 100	6 per 100 (1 to 33)	RR 9.40 (1.16 to 76.20)	154 (2 RCTs)	LOW
Stomachache, nausea, and vomiting	1 per 100	7 per 100 (0 to 62)	RR 5.90 (0.27 to 127. 14)	74 (1 RCT)	LOW
Drowsiness	1 per 100	4 per 100 (0 to 53)	RR 3.43 (0.14 to 87.09)	74 (1 RCT)	LOW
Honey compared to placebo for acute cough in children					
Patient or population: acute cough in children **Setting:** ambulatory **Intervention:** honey **Comparison:** placebo					
Day 5					
Cough duration	The mean cough duration was 5.18 days.	MD 0.72 days lower (1.31 lower to 0.13 lower)	/	102 (1 RCT)	MODERATE
Frequency of cough1	The mean frequency of cough (reduction in frequency of cough score) was -1.95	MD 0.48 score lower (2.95 lower to 1.99 higher)	/	102 (1 RCT)	MODERATE
Severity of cough1	The mean severity of cough (reduction in severity of cough score) was -1.96	MD 0.43 score lower (2.21 lower to 1.35 higher)	/	102 (1 RCT)	MODERATE
Bothersome cough1	The mean bothersome cough (reduction in bothersome nature of cough score) was -1.85	MD 0.51 score lower (3.01 lower to 1.99 higher)	/	102 (1 RCT)	MODERATE
Cough impact on children's sleep1	The mean cough impact on children's sleep (cough impact on children' sleep score) was -1.68	MD 0.55 score lower (1.79 lower to 0.69 higher)	/	102 (1 RCT)	MODERATE
Cough impact on parents' sleep	The mean cough impact on parents' sleep (cough impact on parents' sleep score) was - 1.54	MD 0.57 score lower (1.59 lower to 0.45 higher)	/	102 (1 RCT)	MODERATE
Adverse events	**Population**				
Stomachache, nausea, and vomiting	11 per 100	21 per 100 (12 to 35)	RR 1.91 (1.12 to 3.24)	402 (2 RCTs)	MODERATE
Diarrhoea	13 per 100	12 per 100 (4 to 34)	RR 0.92 (0.33 to 2.55)	102 (1 RCT)	LOW
Tachycardia	2 per 100	4 per 100 (0 to 37)	RR 1.58 (0.15 to 16.86)	102 (1 RCT)	LOW
Only day 5 data shown					

Honey compared to salbutamol for acute cough in children					
Patient or population: acute cough in children **Setting:** ambulatory **Intervention**: honey **Comparison**: salbutamol					
Outcomes	**Anticipated absolute effects* (95% CI)**		**Relative effect (95% CI)**	**of participants (studies)**	**Certainty of the evidence (GRADE)**
	Risk with salbutamol	Risk with honey			
Day 5					
Cough duration	The mean cough duration was 5.18 days.	MD 0.72 days lower (1.31 lower to 0.13lower)	/	102 (1 RCT)	MODERATE
Frequency of cough1	The mean frequency of cough (reduction in frequency of cough score) was -1.95	MD 0.48 score lower (2.95 lower to 1.99 higher)	/	102 (1 RCT)	MODERATE
Severity of cough1	The mean severity of cough (reduction in severity of cough score) was -1.96	MD 0.43 score lower (2.21 lower to 1.35 higher)	/	102 (1 RCT)	MODERATE
Bothersome cough1	The mean bothersome cough (reduction in bothersome nature of cough score) was -1.85	MD 0.51 score lower (3.01 lower to 1.99 higher)	/	102 (1 RCT)	MODERATE
Cough impact on children's sleep1	The mean cough impact on children's sleep (cough impact on children's sleep score) was -2.47	MD 0.15 higher (0.04 higher to 0.26 higher)	/	100 (1 RCT)	MODERATE
Cough impact on parents' sleep1	The mean cough impact on parents' sleep (cough impact on parents' sleep score) was -2.33	MD 0.04 higher (0.01 higher to 0.07 higher)	/	100 (1 RCT)	MODERATE
Only day 5 data shown					

Adverse events	**Population**				
Stomachache, nausea, and vomiting	30 per 100	53 per 100 (31 to 88)	RR 1.74 (1.04 to 2.92)	100 (1 RCT)	MODERATE
Rash	9 per 100	2 per 100 (0 to 15)	RR 0.19 (0.02 to 1.63)	100 (1 RCT)	MODERATE
Tachycardia	2 per 100 4	4 per 100 (0 to 39)	RR 1.51 (0.14 to 16.10)	100 (1 RCT)	LOW
Diarrhoea	21 per 100	12 per 100 (5 to 30)	RR 0.59 (0.24 to 1.45)	100 (1 RCT)	MODERATE

Applicability

Studies were conducted in Iran, Israel, in the USA, in Brazil and in Kenya.

Conclusions

Honey probably relieves cough symptoms to a greater extent than no treatment, diphenhydramine, and placebo, but may make little or no difference compared to dextromethorphan. Honey probably reduces cough duration better than placebo and salbutamol. There was no strong evidence for or against using honey. Most of the children received treatment for one night, which is a limitation to the results of this review. There was no difference in occurrence of adverse events between the honey and control arms.

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