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LETTERS

Vitamin C and zinc lozenges for COVID-19?

To the Editor:

We share Marwitz¹ concerns regarding widespread misinformation about coronavirus disease 2019 (COVID-19) treatments. However, we do not agree with the statement that "Past examples of vitamin C and zinc, marketed for common cold symptoms, make extensive claims about treating and curing common colds, but the data do not fully support safety and efficacy of these agents."^{2–4} Ironically, these agents are being promoted as unsubstantiated treatments or preventives for COVID-19 today.²

In our Cochrane review, we found that regular vitamin C supplementation of at least 0.2 g/d shortened the duration of viral respiratory tract infections in adults by 7.7% ($P < 0.001$) and in children by 14.2% ($P < 0.001$).⁴ Our review supports the safety and efficacy of vitamin C.⁴ We did not demonstrate an effect when vitamin C was administered as a treatment, but low doses, short treatment, and late treatment may explain negative findings.⁴ Vitamin C may also have an effect on COVID-19,⁵ and a recent randomized trial observed that vitamin C increased the recovery rate of outpatients infected with severe acute respiratory syndrome coronavirus 2 by 70%.⁶

Marwitz¹ refers to a zinc review³; however, the review is flawed.⁷ There is strong evidence that appropriately composed zinc lozenges can shorten the duration of respiratory virus infections.^{8–11} Unfortunately, many of the zinc lozenges on the U.S. market contain either doses of zinc which are too low or substances that bind zinc ions so tightly that they are ineffective.¹¹

There is much misinformation about vitamin C and zinc in popular forums and also, unfortunately, in scientific forums^{4,6,7,12–15}; however, the positive findings from randomized trials should not be ignored.

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References

1. Marwitz KK. The pharmacist's active role in combating COVID-19 medication misinformation. *J Am Pharm Assoc* (2023). 2021;61(2):e71–e74.
2. Adams KK, Baker WL, Sobieraj DM. Myth busters: dietary supplements and COVID-19. *Ann Pharmacother*. 2020;54(8):820–826.
3. Science M, Johnstone J, Roth DE, Guyatt G, Loeb M. Zinc for the treatment of the common cold: a systematic review and meta-analysis of randomized controlled trials. *CMAJ*. 2012;184(10):E551–E561.
4. Hemilä H, Chalker E. Vitamin C for preventing and treating the common cold. *Cochrane Database Syst Rev*. 2013;2013(1):CD000980.
5. Hemilä H, de Man AME. Vitamin C and COVID-19. *Front Med (Lausanne)*. 2020;7:559811.
6. Hemilä H, Carr A, Chalker E. Vitamin C may increase the recovery rate of outpatient cases of SARS-CoV-2 infection by 70%; reanalysis of the COVID A to Z randomized clinical trial. *Front Immunol*. 2021;12:674681.
7. Hemilä H. Zinc acetate lozenges may shorten common cold duration by up to 40%. *CMAJ eLetter*. 2012;184(10). Available at: <https://researchportal.helsinki.fi/en/publications/zinc-acetate-lozenges-may-shorten-common-cold-duration-by-up-to-4>. Accessed June 8, 2021.
8. Hemilä H, Chalker E. The effectiveness of high dose zinc acetate lozenges on various common cold symptoms: a meta-analysis. *BMC Fam Pract*. 2015;16:24.
9. Hemilä H, Fitzgerald JT, Petrus EJ, Prasad A. Zinc acetate lozenges may improve the recovery rate of common cold patients: an individual patient data meta-analysis. *Open Forum Infect Dis*. 2017;4(2):ofx059.
10. Hemilä H. Zinc lozenges and the common cold: a meta-analysis comparing zinc acetate and zinc gluconate, and the role of zinc dosage. *JRSM Open*. 2017;8(5):2054270417694291.
11. Eby 3rd GA. Zinc lozenges as cure for the common cold—a review and hypothesis. *Med Hypo*. 2010;74(3):482–492.
12. Hemilä H. Vitamin C supplementation and common cold symptoms: problems with inaccurate reviews. *Nutrition*. 1996;12(11–12):804–809. Available at: <https://helda.helsinki.fi/handle/10138/225877>. Accessed June 8, 2021.
13. Hemilä H. Vitamin C, the placebo effect, and the common cold: a case study of how preconceptions influence the analysis of results [discussion 1085–1087] *J Clin Epidemiol*. 1996;49(10):1079–1084. Available at: <https://helda.helsinki.fi/handle/10250/8082>. Accessed June 8, 2021.
14. Hemilä H, Chalker E. Meta-analysis on vitamin C and the common cold in children may be misleading. *Eur J Clin Pharmacol*. 2019;75(12):1747–1748.
15. Hemilä H, Chalker E. Commentary: The long history of vitamin C: from prevention of the common cold to potential aid in the treatment of COVID-19. *Front Immunol*. 2021;12:659001.

Re: Vitamin C and zinc lozenges for COVID-19?

To the Editor:

I appreciate the comments brought forward by Dr. Hemilä and Ms. Chalker regarding the efficacy of vitamin C and zinc