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# Zinc in Treatment of Acute Respiratory Virus Infections

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## ABSTRACT

Zinc in the form of oral pills or lozenges in therapeutic doses (75-200 mg/day), in combination with a Zinc ionophore like Ivermectin, merits renewed consideration in the treatment of acute respiratory virus infections, owing to the success of Zinc in the treatment of COVID-19.

## Introduction

Zinc is one of the oldest medicines used by humans for ~3,000 years <sup>(Bell Chem, 2021)</sup>.

The COVID-19 pandemic boosted multiple anti-viral treatments, repurposing old drugs approved for other conditions and using simple over-the-counter substances previously showing anti-viral activity only in vitro or small trials.

Zinc has been used successfully in leading COVID-19 treatments <sup>(Boretti, 2022), (Derwand et al., 2020), (Ngo et al., 2021), (Million et al., 2021)</sup>, particularly as part of Ivermectin-based protocols. There should be renewed interest in Zinc in treating acute respiratory virus infections, but this does not occur.

Zinc possesses multiple anti-viral mechanisms, including immune system stimulation, prevention of virus entry into cells, and prevention of virus replication in cells <sup>(Wieland et al., 2021)</sup>.

Zinc ions require appropriate ionophores to enter most cells <sup>(Velthuis et al., 2010)</sup>. Ivermectin and HCQ are zinc ionophores that tend to accumulate in the respiratory epithelium, assisting in the delivery of zinc where needed.

Apparently, some of the Zinc anti-viral mechanisms do not require entering cells. Oral Zinc in combination with an ionophore and certain Zinc lozenges are two effective methods of Zinc delivery.

This paper intends to revive interest in Zinc for acute respiratory virus infection treatment.

Zinc excess is harmful to the immune system. It might be associated with a long time (like six weeks) excessive intake of Zinc <sup>(Chandra, 1984)</sup>. This is not a factor in acute respiratory diseases, where the potential treatment time is less than ten days.

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## Methods

The method is a narrative review. A mini search of trials registered in ClinicalTrials.gov has been conducted in the middle of August 2023:

<https://clinicaltrials.gov/search?intr=zinc&cond=Rhinovirus> : 0

<https://clinicaltrials.gov/search?intr=zinc&cond=Influenza> : 1 (NCT05670444, Tunisia)

<https://clinicaltrials.gov/search?intr=zinc&cond=Common%20Cold> : 1 (NCT04672850, Sweden)

<https://clinicaltrials.gov/search?intr=zinc&cond=RSV> : 0

<https://clinicaltrials.gov/search?intr=zinc&cond=Respiratory%20Syncytial%20Virus> : 0

## Results

### Search for Trials

No US trials of Zinc-based treatment for respiratory virus infections are registered in ClinicalTrials.gov. Only one small trial of Zinc for the common cold is conducted in Sweden; another small trial for COVID-like illnesses was completed in Tunisia in 2023.

### Literature Review

Investigations have shown a positive effect of Zinc on multiple virus-caused diseases (Read et al., 2019), including acute respiratory viral infections (McPherson et al., 2020), (Sadeghsoltani et al., 2022): common cold (rhinovirus (Singh and Das, 2013) and coronavirus), respiratory syncytial virus (RSV) (Suara and Crowe, 2004), and, theoretically at least, influenza (Ishida, 2019).

The best researched is using Zinc against the common cold caused by rhinovirus. In successful trials of Zinc lozenges to reduce the duration of the common cold, the lozenges contained Zinc acetate or Zinc gluconate (Hemilä and Chalker, 2019), used sublingually every 2 hours for waking hours, and contained elemental Zinc in the amounts of 75-210 mg/day (Eby, 2010) or 75-100 mg/day (Hemilä, 2017). This therapeutic dosage should not be confused with the recommended minimum dietary intake of 9-11 mg/day. Lozenges containing other Zinc salts might be ineffective because they bind Zinc stronger (Eby, 2010). This is irrelevant for Zinc in oral pills taken with a Zinc ionophore.

## Discussion

When compared to lozenges, one advantage of Zinc oral pills with ionophore is that they do not interfere with other potential treatments, such as mouth rinsing, gargling, and/or nasal irrigation with an appropriate antiseptic, such as povidone-iodine (c19early.com, 2023), (Sriwilaijaroen et al., 2009).

## Conclusions

Zinc in the form of oral pills or lozenges in therapeutic doses (75-200 mg/day) combined with a Zinc ionophore such as Ivermectin should be considered in treating acute respiratory virus infections.

## No Competing Interests

The author declares no competing interest. No funding was provided for this work.

## Disclaimer

This is not medical advice.

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