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Zinc Cuts COVID Death Risk by 40%

Analysis by Dr. Joseph Mercola ✔ Fact Checked | November 28, 2022

STORY AT-A-GLANCE

- Patients who tested positive for COVID-19 — including 190 outpatients and 280 hospitalized patients — received either oral zinc or a placebo twice daily for 15 days
- Those taking zinc had a nearly 40% lower rate of death and admission to the intensive care unit (ICU)
- Those in the zinc group had, on average, a 3.5-day shorter hospital stay while their symptoms resolved 1.9 days sooner than those who received a placebo
- Research published in 2020 demonstrated that zinc is crucial to immune system function and deficiency can raise your risk of severe COVID-19 illness
- Zinc has antiviral properties and acts as an immunomodulator; it also inhibits RNA synthesis and viral replication, while deficiency is associated with reduced natural killer cell function

It's estimated that 1 in 3 Americans is deficient in at least 10 minerals, zinc included.[1] Not only does this put them at risk of chronic diseases such as heart disease and diabetes,[2] but it may increase risk of death or a hospital stay from COVID-19 if you're infected.[3]

Zinc has been acknowledged as an essential mineral for human health since the 1970s.[4] It's the second most abundant trace mineral found in the human body,[5] but your body cannot store it very well, so you need to consume foods with zinc every day to meet your body's needs. More than 300 enzymes in your body require zinc for normal function,[6]

and it's well-recognized for its role in immunity and normal immune system development.[7]

During the pandemic, the late Dr. Vladimir Zelenko treated thousands of COVID-19 patients using a combination of hydroxychloroquine (HCQ), azithromycin and zinc sulfate,[8] with great success.

However, the use of zinc for SARS-CoV-2 was a topic routinely flagged by COVID fact checkers as "misinformation," so word didn't really get out about its potential as an anti-COVID agent. Now, research once again shows zinc's promise for keeping people healthy if they get COVID.

Zinc Twice a Day Treats COVID-19

A team of researchers with Fattouma Bourguiba University Hospital in Tunisia set out to determine zinc's efficacy in treating adults with COVID-19. "Like in many other diseases, regulation of white blood cell production using immuno-nutrition is a novel concept that could be applied to COVID-19," they noted. "Some molecules and nutrients such as zinc play central roles in keeping the function and integrity of the immune system."[9]

They conducted a randomized, double-blind, placebo-controlled trial, during which patients who tested positive for COVID-19 — including 190 outpatients and 280 hospitalized patients[10] — received either oral zinc or a placebo twice daily for 15 days. Those taking zinc had a nearly 40% lower rate of death and admission to the intensive care unit (ICU). They also had shorter hospital stays and cut the number of days needed for their symptoms to resolve.[11]

Specifically, mortality after 30 days was 6.5% in the zinc group compared to 9.2% in the placebo group. ICU admission rate was 5.2% in the zinc group and 11.3% in the placebo group. Further, those in the zinc group had, on average, a 3.5-day shorter hospital stay while their symptoms resolved 1.9 days sooner than those who received a placebo.[12]

The beneficial effects of zinc were seen even in subgroups of patients, including those under 65, people with comorbidities and those who needed oxygen therapy at the start

of the study. No severe adverse effects were seen. In fact, more minor adverse events occurred in the placebo group (7.1%) than in those taking zinc (3.9%).[13] The researchers concluded:[14]

> *"To our knowledge, this study is the first well powered, placebo-controlled clinical trial to report results of zinc for the treatment of patients with COVID-19.*
>
> *When administered orally to patients hospitalized with COVID-19 without end-organ failure, zinc demonstrated its efficacy to prevent ICU admission and to reduce hospital length of stay; for outpatients, zinc reduced symptom duration. Zinc should be considered for the treatment of patients with COVID-19."*

Zinc Deficiency Linked to Worse COVID Outcomes

Research published in 2020 demonstrated that zinc is crucial to immune system function and deficiency can raise your risk of severe COVID-19 illness.[15] "The study data clearly show that a significant number of COVID-19 patients were zinc deficient," the researchers noted. "These zinc deficient patients developed more complications, and the deficiency was associated with a prolonged hospital stay and increased mortality."[16]

There are a number of reasons why lack of zinc could worsen COVID-19 outcomes, not the least of which is zinc's antiviral properties and action as an immunomodulator. Zinc inhibits RNA synthesis and viral replication, while deficiency is associated with reduced natural killer cell function.

Zinc supplements have long been used to treat the common cold, which is usually caused by coronaviruses, and are known to shorten the duration of symptoms and severity of respiratory infections.[17] Writing in the Journal of Infectious Disease, researchers explained:[18]

> *"Interestingly, hydroxychloroquine, a drug used initially in the management of COVID-19, is an ionophore that transports zinc across the hydrophobic cell membrane.*

> *Moreover, evidence specifically suggests that zinc supplements with antiviral drugs containing zinc ionophores precisely target and bind to SARS-CoV-2 preventing its replication within the infected host cells. Intracellularly, zinc binds with RNA-dependent RNA polymerase causing elongation inhibition and decreased template binding of the viral mRNA.*"

Chances are you've heard of HCQ being used for COVID-19, but the real key in early treatment protocols that used HCQ is the zinc. The primary role of the HCQ is to boost zinc uptake in the cell.

In similar research, COVID-19 disease severity was associated with low levels of selenium and mortality was associated with zinc deficiency, particularly in patients with diabetes. However, the majority of those who died had a combination of selenium and zinc deficits.[19]

Micronutrients such as zinc, the researchers explained, "may be of high relevance for reducing SARS-CoV-2 infection risk, supporting the immune system in combating the virus, and avoiding long-term adverse health issues from COVID-19." They added:[20]

> *"There are ... a number of studies and reviews highlighting a potentially important role of Zn [zinc] supply, Zn status and Zn distribution in COVID-19, suggesting supplemental Zn as a promising therapeutic adjuvant.*
>
> *Virus replication is enhanced in Zn deficiency, and supplemental Zn can inhibit virus spread and proliferation, as shown in preclinical studies and infected subjects. It is assumed that Zn deficiency predisposes to severe COVID-19, and accordingly high death rates of COVID-19 patients with Zn deficits have been observed in clinics."*

How Zinc Influences Immune Function

Zinc's complex role in immune function continues to be unraveled. Zinc is required for the development of disease-fighting T cells and for the regeneration of your thymus, which produces T cells.

Further, a molecule inside your cells called GPR39 acts as a sensor that tracks changes in external zinc, and when the level rises, GPR39 triggers the release of a key renewal factor and thymic regeneration. In short, it appears that zinc helps the immune system to regrow immune cells.[21]

"What we think is going on is, as you give zinc supplementation, that gets accumulated within the developing T cells. It gets stored and stored and stored, then the damage comes along and the zinc is released," Dr. Jarrod Dudakov, an immunologist at Fred Hutchinson Cancer Research Center, said in a news release.

"Now you have more zinc than you normally would, and it can instigate this regenerative pathway."[22] Zinc also influences immune function in a number of additional ways, including:[23]

People who are deficient in zinc have an increased susceptibility to pathogens, as zinc helps prevent viruses from entering[24] and replicating[25] inside your cells.

Zinc mediates nonspecific immunity, including natural killer cells and neutrophils.

Zinc deficiency prevents the activation of T-lymphocytes, production of Th1 cytokine, and the ability of B lymphocytes to help. During deficiency, B lymphocyte development is also compromised.

Deficiency affects the function of macrophage cells, which can trigger cytokine production[26] and dysregulated intracellular death. Thus, with a deficiency in zinc, you not only get more viral infections, but these trigger an increase in the hyper inflammatory response.

Zinc is central to DNA replication, RNA transcription and cell activation and division.

Zinc supports growth and function of ciliary hairs in your respiratory system. Research published in the American Journal of Rhinology and Allergy[27] showed zinc stimulates ciliary beat frequency and may help improve mucociliary clearance, which

is essential for clearing the lungs of mucous. Another group of scientists found that supplementing animals deficient in zinc affected the length of the cilia and number of epithelial cells in the bronchus.[28]

Zinc improves your respiratory epithelial barrier.[29,30]

Zinc influences interferon-gamma (IFN-γ), which plays a significant role in defending against intracellular pathogens.[31] When there is a reduction in this cytokine, your immune function will be impaired.

How to Improve Zinc's Effectiveness

One caveat regarding zinc is that it's not very bioavailable. To improve its uptake in your cells, zinc ionophores are useful. These work by shuttling zinc through the cellular membrane and into the cell, which is crucial for its role in stopping virus replication. In addition to HCQ, mentioned earlier, other zinc ionophores include chloroquine, quercetin and epigallocatechin gallate (EGCG).[32]

When HCQ was banned from use for COVID, many wisely turned to quercetin, which is available over the counter and also has beneficial properties, such as antiviral activities,[33] of its own. A number of studies have shown quercetin, when used early, also lowers your risk of hospitalization and death from COVID,[34] and improves clinical outcomes.

Signs of Deficiency and Food Sources of Zinc

Common signs[35] your body may need more zinc include lack of appetite, mental lethargy, impaired sense of taste or smell, frequent colds, flu or infections, hair loss[36] and poor neurological function.[37] Individuals at higher risk for zinc deficiency include those with malnutrition, persistent diarrhea,[38] the elderly, people with inflammatory or autoimmune diseases, chronic alcoholics, vegetarians and vegans.

Although it may be necessary to supplement during illness when your body needs more zinc, I recommend trying to get your zinc from foods. Fortunately, many foods are rich in zinc, including the following:[39,40,41]

Alaskan King crab	Oysters	Almonds	Cashews
Kidney beans	Pastured chicken	Lamb	Chickpeas
Oatmeal	Grass fed beef	Cheddar or Swiss cheese	Yogurt
Mushrooms	Spinach	Pork chops	Pumpkin seeds

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