VIA MEDICA

LETTER TO THE EDITOR

Disaster and Emergency Medicine Journal
2023, Vol. 8, No. 4, 265–266
DOI: 10.5603/DEMJ.a2023.0030
Copyright © 2023 Via Medica
ISSN 2451–4691, e-ISSN 2543–5957

THE ASSOCIATION BETWEEN ZINC LEVELS AND COVID-19 SEVERITY

Katarzyna Kiezun[1], Sergiusz Blek[2], Zofia Zadorozna[1], Olga Sitek[1], Janusz Patera[3]

[1]Students Research Club, Maria Sklodowska-Curie Medical Academy, Warsaw, Poland
[2]Research Unit, Polish Society of Disaster Medicine, Warsaw, Poland
[3]Institute of Outcomes Research, Maria Sklodowska-Curie Medical Academy, Warsaw, Poland

KEYWORDS: zinc; supplementation; COVID-19; SARS-CoV-2

Disaster Emerg Med J 2023; 8(4): 265–266

In the Journal of Infection Wu et al.'s [1] published an article on the relationship between zinc deficiency and COVID-19 clinical outcomes with great interest. According to the scientific literature, there is evidence to suggest a link between zinc (Zn) deficiency and poorer clinical outcomes in SARS-CoV-2 infections, notably in terms of all-cause mortality [2–5]. This association is influenced by a number of things.

Firstly, zinc is essential for maintaining a healthy immune system. It plays a role in the formation and function of immune cells such as T cells and natural killer cells, as well as in antibody synthesis. A Zn deficit can affect immunological function, resulting in a decreased response to viral diseases such as SARS-CoV-2. This weakened immune response may lead to increased viral replication, illness progression, and, ultimately, an increased risk of complications and fatalities.

It is also important to note that zinc has direct antiviral effects. It has the ability to disrupt viral replication by reducing viral RNA synthesis and regulating viral protein activity. Adequate zinc levels may decrease viral replication and lessen the severity of viral infections. Zinc deficiency, on the other hand, may impair these antiviral activities, allowing the virus to replicate more efficiently and contributing to a more severe course of illness.

Zinc is also involved in the regulation of inflammatory reactions and oxidative stress. It functions as an antioxidant to prevent oxidative damage from reactive oxygen species and aids in controlling the production and activity of pro-inflammatory cytokines. Zinc deficiency can alter these processes, resulting in increased inflammation and oxidative stress, both of which are linked to more severe COVID-19 outcomes such as organ damage and death.

Furthermore, new evidence suggests that COVID-19 might generate a prothrombotic state and cause endothelial dysfunction, which can lead to consequences like blood clots and cardiovascular problems. Zinc is required for healthy blood coagulation and vascular function. Zinc deficiency may interfere with these processes, increasing the risk of thrombosis and cardiovascular problems in COVID-19 patients.

While the scientific literature supports the link between zinc deficiency and poor clinical outcomes in SARS-CoV-2 infections, more study is needed to confirm causation and understand the particular mechanisms behind this relationship. Future

CORRESPONDING AUTHOR:
Katarzyna Kiezun, Students Research Club, Maria Sklodowska-Curie Medical Academy, Zelaznej Bramy 10 Str., 00–136 Warsaw, Poland
e-mail: katarzyna.kiezun@gmail.com
Submitted: 13.07.2023 Accepted: 16.07.2023 Published online: 1.08.2023
This article is available in open access under Creative Common Attribution-Non-Commercial-No Derivatives 4.0 International (CC BY-NC-ND 4.0) license, allowing to download articles and share them with others as long as they credit the authors and the publisher, but without permission to change them in any way or use them commercially.

research should look into the possible benefits of zinc supplementation in COVID-19 patients, particularly those who are zinc deficient, to see if improving zinc status will improve clinical outcomes and lower mortality rates. Overall, assessing zinc status as part of COVID-19 clinical care is critical, since treating zinc insufficiency may help reduce the risk of poor outcomes, including all-cause death.

Article information and declarations

Acknowledgments

None.

Conflict of interest

The authors declare no conflict of interest.

Funding

This research received no external funding.

REFERENCES

1. Wu JY, Hsu WH, Tsai YW, et al. The association between zinc deficiency, and clinical outcomes of COVID-19. J Infect. 2023 [Epub ahead of print], doi: 10.1016/j.jinf.2023.06.021, indexed in Pubmed: 37393053.
2. Wu JY, Liu TH, Huang PY, et al. The effect of zinc on the outcome of patients with COVID-19: A systematic review and meta-analysis of randomized controlled trials. J Infect. 2023; 86(5): e142–e143, doi: 10.1016/j.jinf.2023.01.023, indexed in Pubmed: 36693569.
3. Olczak-Pruc M, Szarpak L, Navolokina A, et al. The effect of zinc supplementation on the course of COVID-19 - A systematic review and meta-analysis. Ann Agric Environ Med. 2022; 29(4): 568–574, doi: 10.26444/aaem/155846, indexed in Pubmed: 36583325.
4. Szarpak L, Pruc M, Gasecka A, et al. Should we supplement zinc in COVID-19 patients? Evidence from a meta-analysis. Pol Arch Intern Med. 2021; 131(9): 802–807, doi: 10.20452/pamw.16048, indexed in Pubmed: 34180610.
5. Xu W, Liu Y, Zou X, et al. Hypozincemia in COVID-19 patients correlates with stronger antibody response. Front Immunol. 2021; 12: 785599, doi: 10.3389/fimmu.2021.785599, indexed in Pubmed: 35058926.