Administering zinc to COVID-19 patients could help towards their recovery

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From left to right: Dr. Güerri and Dr. Horcajada. Credit: Hospital del Mar

Administering zinc supplements to COVID-19 patients with low levels

of this element may be a strategy to reduce mortality and recovery time. At the same time, it could help to prevent risk groups, like the elderly, from suffering the worst effects of the disease. These are the findings of a study by physicians and researchers from the Hospital del Mar, Hospital del Mar Medical Research Institute (IMIM) and Pompeu Fabra University (UPF), led by Dr. Robert Güerri, a physician at the Infectious Diseases Service of Hospital del Mar, which has just been published in the journal *Nutrients*.

The study analyzed the zinc levels of 249 adult patients treated at the center between 9 March and 1 April 2020, with an average age of 65 years. The most common symptoms presented at the time of admission were fever, cough and dyspnea. In all cases, they analyzed their blood zinc levels, considering those under 50 µ/dl as being low. As explained by Dr. Güerri, first author of the clinical study, they analyzed this parameter because "zinc is an essential element for maintaining a variety of biological processes, and altering its levels causes increased susceptibility to infections and increased inflammatory response." For this reason, "given the comorbidities associated with zinc deficiency and its immunomodulatory and antiviral actions, zinc levels and zinc supplementation may prove useful tools to tackle the COVID-19 crisis."

Higher mortality in patients with lower zinc levels

1 in 4 patients had low levels of zinc. This group had more severe symptoms and higher levels of inflammation as measured by two markers, C-reactive protein (CRP) and interleukin 6 (IL-6), which mediate the inflammatory response. On average, their length of hospital stay was three times longer than patients with higher levels of zinc (25 days compared to 8).

Regarding mortality, zinc levels were significantly higher in patients who survived the infection, 62 µ/dl, versus 49 µ/dl for those who died.

Moreover, 1 in 5 patients with low zinc levels died. Conversely, the mortality rate of those presenting higher levels upon admission was 5%. The study reveals that a one-unit increase of zinc in blood plasma is directly linked to a 7% reduction of the risk of dying from COVID-19. Dr. Güerri highlights that "we have shown the importance of zinc levels in patients' blood as an additional predictor of outcome in COVID-19, as well as its potential as a therapeutic tool for treatment. We therefore propose this variable as a new parameter to predict the evolution of patients and we propose initiating clinical trials concerning zinc supplementation in patients with low levels admitted for COVID-19 and implementing programs to administer supplements to groups at risk of having low zinc levels to reduce the effects of the pandemic."

Effect of zinc on the replication of the coronavirus

The study involved the collaboration of the groups of Dr. Rubén Vicente and Dr. Juana Díez at UPF. Their efforts, using in vitro techniques, have focused on studying in parallel the effects of zinc levels on the virus's capacity to expand. The results confirm that the poor prognosis in patients with low concentrations of zinc is due both to the effect that a lack of zinc has on immune imbalance and the increase in viral load, as they found that low levels of zinc enhance the expansion of the virus in infected cells.

At the same time, the results indicate that an element must be sought to enable enhancing the activity of zinc in the cell to block viral replication, as their studies have shown that contrary to what had been speculated at the onset of the pandemic, chloroquine cannot perform this function.

More information: Marina Vogel-González et al, Low Zinc Levels at Admission Associates with Poor Clinical Outcomes in SARS-CoV-2 Infection, *Nutrients* (2021). DOI: 10.3390/nu13020562

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