High ferritin in severe COVID-19 pneumonia is linked to improved outcomes after steroid treatment

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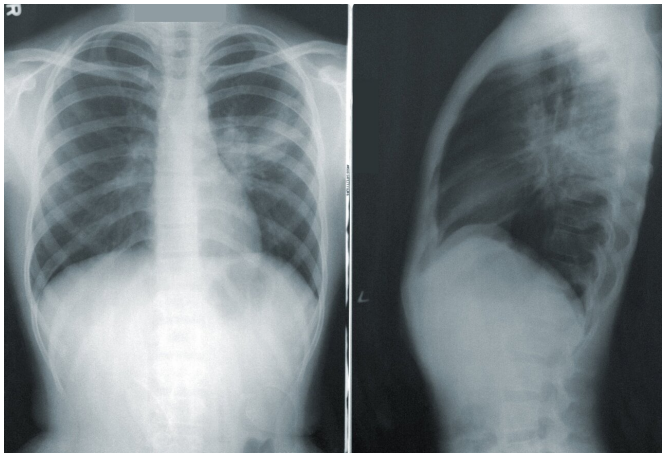

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During the entire pandemic, physicians treating patients with severe COVID-19 pneumonia have continuously looked for hints and signs on what may enable patients to have better outcomes. A team of physicians at the Renaissance School of Medicine at Stony Brook University has discovered that for patients with severe COVID-19 pneumonia who had higher ferritin in their blood upon admission and were treated with a corticosteroid, fewer intubations and deaths resulted. Their findings are reported this month in *JAMA Network Open*.

In this study, the physician team evaluated the blood serum levels of ferritin, an indicator of body iron stores that can rise dramatically during acute infections. Data existed on ferritin levels upon admission in 380 non-intubated patients with severe COVID-19 pneumonia. Of these patients, 142 (37.4%) had received the corticosteroid methylprednisolone to reduce lung inflammation and high-flow oxygen therapy. These patients were part of the first wave of the pandemic and treated in the hospital from March 1 to April 15, 2020.

Because ferritin may be a good marker of appropriate versus too much inflammation in severe COVID-19 pneumonia, the research team decided to look at levels of ferritin in the cohort. They categorized ferritin levels in tertiles, as low, medium, and high—ferritin in the high tertile was over 1300 ng/mL. They found a clear association with better outcomes in patients with high levels of ferritin who received methylprednisolone. But for those with medium or low levels of ferritin, methylprednisolone was not associated with a benefit.

For patients having the highest level of ferritin, methylprednisolone was associated with approximately 80 percent lower mortality and more than 50 percent lower risk of the composite end point of death or mechanical ventilation at 28 days.

"Our results need to be interpreted with caution as it is an observational study but it supports an important hypothesis—we could use ferritin, and perhaps other inflammatory blood markers to see who needs corticosteroids among patients admitted for COVID-19 pneumonia in an attempt to prevent intubation and death," says Andreas Kalogeropoulos, MD, MPH, Ph.D., corresponding author and Associate Professor of Cardiology at the Renaissance School of Medicine.

"With this approach, we could optimize benefit versus risk balance of corticosteroid use in this patient population as these agents can have adverse effects," says Hal Skopicki, MD Ph.D., senior author, and Ambassador Charles A. Gargano Chair of Cardiology.

Aikaterini Papamanoli, MD, first author and a

physician in the Division of Infectious Diseases, says their findings warrant a prospective investigation of ferritin levels and use of corticosteroids in severe COVID-19 pneumonia, particularly in view of adjunct immunomodulatory therapies that are increasingly used and tested in these patients.

The authors add that future research could test their hypothesis by randomizing patients to methylprednisolone (or another corticosteroid) or placebo, stratified by hospital admission ferritin levels.

More information: Aikaterini Papamanoli et al, Association of Serum Ferritin Levels and Methylprednisolone Treatment With Outcomes in Nonintubated Patients With Severe COVID-19 Pneumonia, *JAMA Network Open* (2021). DOI: 10.1001/jamanetworkopen.2021.27172

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