

# Corticosteroids lower the likelihood of in-hospital mortality from COVID-19, study shows

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In a registry-based cohort study of 109 institutions, Mayo Clinic researchers evaluated the use of corticosteroids in hospitalized patients

needing oxygen due to severe COVID-19 disease. The study assessed biomarker-concordant corticosteroid use in patients tested for a protein that causes inflammation.

Corticosteroid drugs treat a variety of conditions such as pneumonia and [acute respiratory distress syndrome](#) (ARDS) and suppress the immune system's response to COVID-19. The findings suggest using this approach for [patients](#) with [severe disease](#) lowers the likelihood of in-hospital mortality. The paper is published in the *Journal of Intensive Care Medicine*.

To identify which patients with severe COVID-19 to study, the researchers looked at those who had been tested within 48 hours of admission for their level of C-reactive [protein](#), a protein made by the liver and found in the blood. A high level of C-reactive protein can indicate a patient has a serious health condition that causes inflammation—and this protein level can be checked with a simple blood test.

"We examined C-reactive protein as a single inflammatory biomarker based on its affordability, availability and rapid turnaround time compared to other biomarkers," says the study's lead author, Aysun Tekin, M.D., a research fellow in the Division of Nephrology and Hypertension.

Within the selected study group, the researchers examined what systemic corticosteroid treatments were used other than those that were topical or inhaled. They found the most common corticosteroid drug administered was dexamethasone, followed by methylprednisolone, prednisone and hydrocortisone. The study did not include patients who were already on corticosteroids before admission, who were discharged in under 48 hours or who did not need treatment with oxygen.

Researchers found that the likelihood a patient would die in the hospital was significantly lower in severe cases of COVID-19 when corticosteroid treatment was administered in alignment with the blood test results compared to those who did not receive corticosteroids. The alignment is known as a biomarker-concordant approach.

The study found that use of corticosteroids made a "significant" difference in the death rate of patients with high C-reactive protein levels and also was associated with a lower rate of those patients needing to be put on a ventilator.

Dr. Tekin notes that this finding may enable care teams to identify patients at a greater risk for complications and pursue the most effective course of treatment for them.

"Fortunately, the incidence of severe COVID-19 disease, associated need for hospitalization and mortality continues on the downtrend," says last author Yewande E. Odeyemi, M.B.B.S., a pulmonologist and Kern Health Care Delivery Scholar.

Dr. Odeyemi says the precision medicine approach taken with the COVID-19 study can also help guide future studies regarding steroid use to treat other diseases.

"Our research team is excited to continue working on individualizing [corticosteroid](#) use in pneumonia with plans to initiate a randomized control trial in non-COVID-19 pneumonia in the near future," she says.

**More information:** Aysun Tekin et al, Biomarker-Concordant Steroid Administration in Severe Coronavirus Disease-2019, *Journal of Intensive Care Medicine* (2023). [DOI: 10.1177/08850666231177200](https://doi.org/10.1177/08850666231177200)

Provided by Mayo Clinic

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