

Early predictor of severe respiratory failure in patients with COVID-19 identified

May 4 2020



Credit: CC0 Public Domain

A very high level of a protein known as suPAR in the blood of patients with COVID-19 may be a predictor of severe respiratory failure, according to new research published in *Critical Care* on April 30. The findings by researchers at Rush University Medical Center and other institutions suggest suPAR could be a potential predictor for which patients with COVID-19 will need to be put on ventilators to help them breathe.

"This is the first report in the world to show that suPAR is elevated in COVID-19 and is predictive. Since suPAR is a reactant of the innate immune system, it's an indicator of disease severity," said Jochen Reiser, MD, Ph.D., the Ralph C. Brown, MD, Professor of Internal Medicine, chairperson of the Department of Internal Medicine at Rush.

"These results show that the higher the plasma suPAR level, the worse the outcome will be in the lungs of these patients," said Reiser, who is co-correspondent author of the study. "The higher the suPAR level, the shorter the time before patients needed intubation."

Reiser's research team tested suPAR levels in 15 Rush patients when they were admitted or tested for COVID-19. The University of Athens Medical School measured 57 patients for suPAR and followed them in their clinical course. Time to intubation was followed and found to be shorter in patients with a higher plasma suPAR.

"There is a body of literature that suPAR is associated with poor outcomes from [acute respiratory distress syndrome](#) (a condition in many patients with severe COVID-19) and poor lung functioning in critically ill patients," Reiser said.

Reiser also mentions that the link between suPAR and respiratory failure suggests a way to help manage patients with COVID-19.

"If we measure suPAR as part of diagnosing COVID-19, we may know whom to watch more and whom to send home," he said. "Plasma suPAR levels give us a window into the course of the disease, allowing for an improved monitoring and applying new and supportive treatments early."

The findings of the present research raise additional new questions about a role for suPAR in COVID-19-associated organ dysfunction.

Soluble urokinase plasminogen activator receptor, aka suPAR, is produced in the endobronchial tree in the lungs and by immune cells in the bone marrow and repeatedly has been shown to harm kidneys. In two publications in the *New England Journal of Medicine*, Reiser's research showed that chronically elevated blood levels are linked to [development of chronic kidney disease](#), yet a high plasma suPAR also increases [the risk for acute kidney injury](#)—a sudden decline in [kidney function](#) that can be a severe side effect of general medical procedures.

Reportedly, an increasing number of patients with severe COVID-19 also develop kidney problems, which is leading researchers to investigate the connection between COVID-19, suPAR and kidney disease.

"Our research on suPAR and COVID-19 associated lung injury is based on a [small sample size](#), and we will need more data, but the findings support a concept that suPAR is harmful in COVID-19. It may therefore play a prognostic and a causal role in COVID-19 associated [kidney disease](#)," Reiser said.

More information: Nikoletta Rovina et al. Soluble urokinase plasminogen activator receptor (suPAR) as an early predictor of severe respiratory failure in patients with COVID-19 pneumonia, *Critical Care* (2020). [DOI: 10.1186/s13054-020-02897-4](https://doi.org/10.1186/s13054-020-02897-4)

Provided by Rush University Medical Center

Citation: Early predictor of severe respiratory failure in patients with COVID-19 identified (2020, May 4) retrieved 28 April 2024 from <https://medicalxpress.com/news/2020-05-early-predictor-severe-respiratory-failure.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.