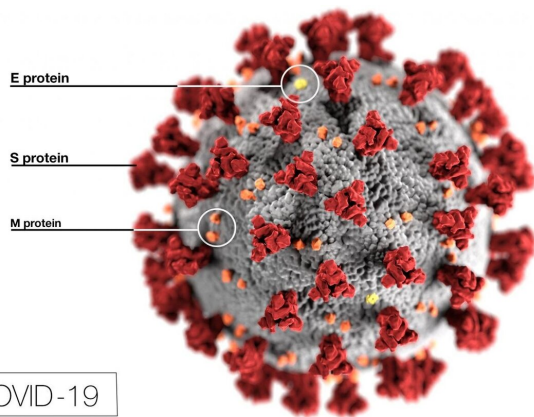


ACE inhibitors and angiotensin receptor blockers may increase the risk of severe COVID-19

23 March 2020



SARS-CoV-2 Credit: Centers for Disease Control and Prevention

James Diaz, MD, MHA, MPH & TM, Dr. PH, Professor and Head of Environmental Health Sciences at LSU Health New Orleans School of Public Health, has proposed a possible explanation for the severe lung complications being seen in some people diagnosed with COVID-19. The manuscript was published by Oxford University Press online in the *Journal of Travel Medicine*, available [here](#).

The SARS beta coronaviruses, SARS-CoV, which caused the SARS (Severe Acute Respiratory Syndrome) outbreak in 2003 and the new SARS-CoV-2, which causes COVID-19, bind to angiotensin converting enzyme 2 (ACE2) receptors in the lower respiratory tracts of infected patients to gain entry into the lungs. Viral pneumonia and potentially fatal respiratory failure may result in susceptible persons after 10-14 days.

"Angiotensin-converting enzyme inhibitors (ACEIs) and [angiotensin receptor blockers](#) (ARBs) are

highly recommended medications for patients with cardiovascular diseases including heart attacks, [high blood pressure](#), diabetes and [chronic kidney disease](#) to name a few," notes Dr. Diaz. "Many of those who develop these diseases are older adults. They are prescribed these medications and take them every day."

Research in experimental models has shown an increase in the number of ACE2 receptors in the cardiopulmonary circulation after intravenous infusions of ACE inhibitors.

"Since patients treated with ACEIs and ARBs will have increased numbers of ACE2 receptors in their lungs for coronavirus S proteins to bind to, they may be at increased risk of severe [disease](#) outcomes due to SARS-CoV-2 infections," explains Diaz.

Diaz writes, this hypothesis is supported by a recent descriptive analysis of 1,099 patients with laboratory-confirmed COVID-19 infections treated in China during the reporting period, December 11, 2019, to January 29, 2020. This study reported more severe disease outcomes in patients with hypertension, coronary artery disease, diabetes and chronic renal disease. All patients with the diagnoses noted met the recommended indications for treatment with ACEIs or ARBs. Diaz says that two mechanisms may protect children from COVID-19 infections—cross-protective antibodies from multiple upper respiratory tract infections caused by the common cold-causing alpha coronaviruses, and fewer ACE2 receptors in their lower respiratory tracts to attract the binding S proteins of the beta coronaviruses.

He recommends future case-control studies in patients with COVID-19 infections to further confirm chronic therapy with ACEIs or ARBs may raise the

risk for severe outcomes.

In the meantime he cautions, "Patients treated with ACEIs and ARBs for cardiovascular diseases should not stop taking their medicine, but should avoid crowds, mass events, ocean cruises, prolonged air travel, and all persons with respiratory illnesses during the current COVID-19 outbreak in order to reduce their risks of [infection](#)."

More information: James H Diaz, Hypothesis: Angiotensin-converting enzyme inhibitors and angiotensin receptor blockers may increase the risk of severe COVID-19, *Journal of Travel Medicine* (2020). [DOI: 10.1093/jtm/taaa041](https://doi.org/10.1093/jtm/taaa041)

Provided by Louisiana State University

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