

COVID-19 and the use of angiotensin-converting enzyme inhibitors and receptor blockers

Scientific brief

7 May 2020



Background

Concerns exist that angiotensin-converting enzyme inhibitors (ACE inhibitors) and angiotensin receptor blockers (ARBs) increase susceptibility to coronavirus SARS CoV-2 (the viral agent that causes the disease COVID-19) and the likelihood of severe COVID-19 illness.¹ These concerns are based on considerations of biological plausibility,² and the observation that there is an overrepresentation of patients with hypertension and other cardiovascular comorbidities among patients with COVID-19 who have poor outcomes.³ Millions of people around the world are on treatment with ACE-Is and ARBs for hypertension, heart failure, coronary artery disease, or kidney disease. Speculation about worse outcomes among patients on these medications during the COVID-19 pandemic has caused widespread anxiety among patients and their care providers. On the other hand, the harms of indiscriminate withdrawal of these medications on cardiovascular outcomes are well documented.⁴ There is also widespread speculation about the potential benefits of ACE-Is and ARBs, based on biological plausibility arguments and animal data and small clinical studies on patients with other viral respiratory infections.⁵

This brief summarizes the current evidence on the impact of ACE inhibitors or angiotensin receptor blockers on severe acute respiratory illness due to SARS CoV-2.

Methods

A rapid review was carried out using Ovid MEDLINE and the Cochrane Database of Systematic Reviews from 1 January 2003 to 24 April 2020 as well as the World Health Organization database of COVID-19 publications, clinicaltrials.gov, and [medRxiv.org](https://medrxiv.org) from inception to 17 April 2020 using terms for COVID-19, SARS virus, Middle East Respiratory Syndrome, angiotensin-converting enzyme inhibitors, and angiotensin receptor antagonists. Additional citations were identified from hand-searching reference lists. Studies in all languages were included. Study quality was assessed using the Newcastle-Ottawa Quality Assessment Scale.

Review of the evidence

The rapid review identified 11 observational studies,⁶⁻¹⁶ eight of which were conducted in China,^{8-10, 12-16} along with single studies from Italy,¹¹ the United Kingdom,⁷ and the United States.⁶ Nearly all studies included only patients with lab-confirmed COVID-19. No studies were found that were designed to directly assess whether ACE inhibitors or ARBs increase the risk of acquiring COVID-19. After adjustment for confounders, history of ACE inhibitor or ARB use was not found to be associated with increased severity of COVID-19 illness. There were no studies that address the potential benefits and harms of initiating ACE inhibitors or ARBs as treatment for patients with COVID-19.

Conclusion

There is low-certainty evidence that patients on long-term therapy with ACE inhibitors or ARBs are not at higher risk of poor outcomes from COVID-19.

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WHO continues to monitor the situation closely for any changes that may affect this scientific brief. Should any factors change, WHO will issue a further update. Otherwise, this scientific brief document will expire 2 years after the date of publication.

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