

ACE inhibitors found to reduce immune response to bacterial infections

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A team of researchers at Cedars-Sinai Medical Center, has found evidence that suggests giving patients ACE inhibitors reduces the ability

of their immune system to fight off bacterial infections. In their paper published in the journal *Science Translational Medicine*, the group describes testing of multiple ACE inhibitors in mice and human cells.

ACE inhibitors are drugs that are typically given to patients who have hypertension, and in some cases, to people with heart failure, kidney disease or diabetes. Administration of the drugs relaxes the walls of arteries, veins and capillaries, which in turn reduces blood pressure. Some prior research had shown that the drugs also help the immune system by bolstering the efforts of neutrophils—cells produced to fight bacteria. In this new study, the researchers have found the opposite to be true.

To test the impact of ACE inhibitors on the [immune system](#), the researchers gave [test mice](#) different ACE inhibitor brands such as Zestril and Altace, and then tested their ability to ward off bacterial infections. Compared to untreated mice, those with the ACE inhibitors had more difficulty fighting off bacterial infections, such as staph.

Seven human patients who were taking an ACE inhibitor volunteered blood samples to measure their immune response. The researchers found that the neutrophils were unable to produce the molecules needed to fight off bacteria. They were also found to be ineffective when exposed to bacteria in a lab dish.

In related work, the researchers also tested another drug used to treat hypertension, an angiotensin II receptor [drug](#) called Cozaar—such drugs work by preventing arterial walls from constricting, which reduces blood pressure. They found no evidence of a negative impact on immunity. Beta-blockers, which are also prescribed for hypertension, were not tested. They work by preventing adrenergic receptors from being stimulated, which reduces cardiac action.

The researchers conclude that patients given ACE inhibitors are at an increased risk of bacterial infections, noting that doctors may want to try other drugs to treat their patients.

More information: Duo-Yao Cao et al, An ACE inhibitor reduces bactericidal activity of human neutrophils in vitro and impairs mouse neutrophil activity in vivo, *Science Translational Medicine* (2021). [DOI: 10.1126/scitranslmed.abj2138](https://doi.org/10.1126/scitranslmed.abj2138)

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