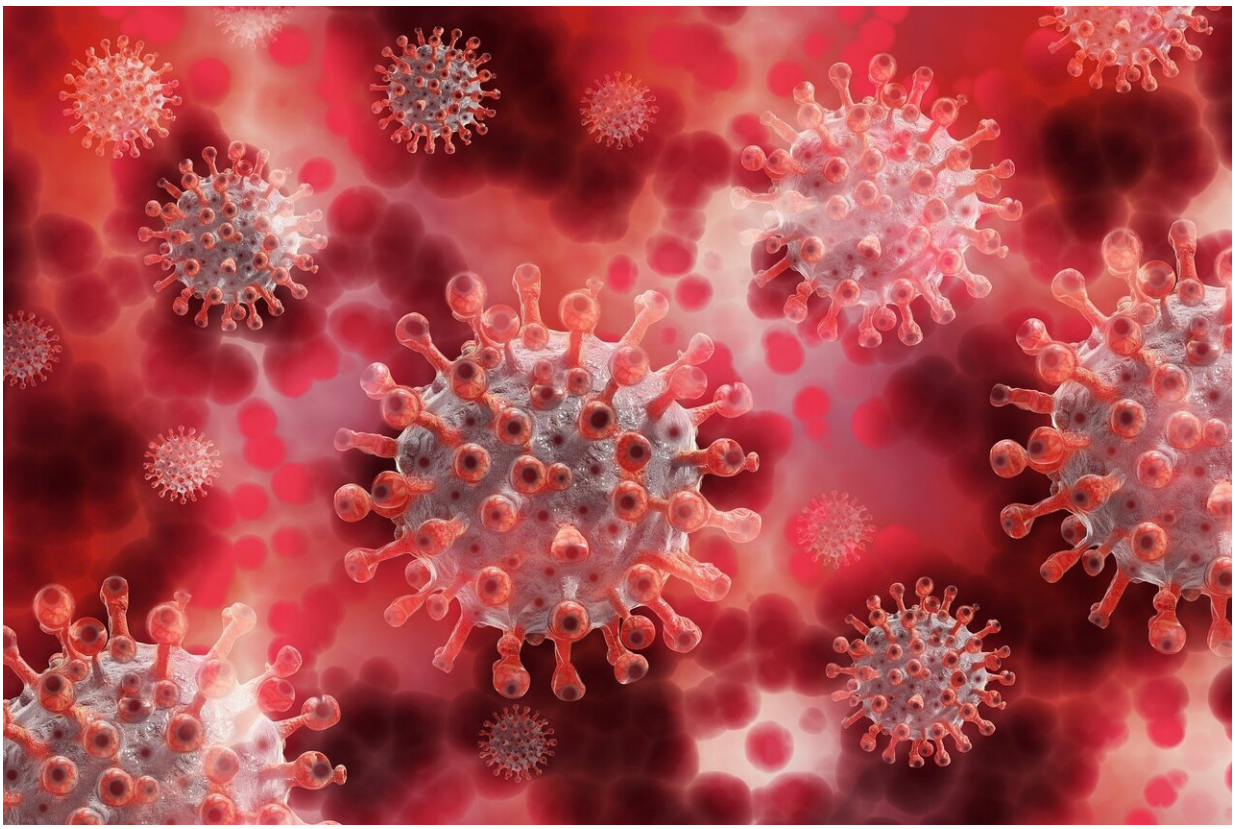
Medical Xpress

COVID-19 can trigger self-attacking antibodies, even in mild or asymptomatic cases

December 30 2021



Credit: Pixabay/CC0 Public Domain

Infection with the virus that causes COVID-19 can trigger an immune response that lasts well beyond the initial infection and recovery—even

among people who had mild symptoms or no symptoms at all, according to Cedars-Sinai investigators. The findings are published in the *Journal of Translational Medicine*.

When people are infected with a virus or other pathogen, their bodies unleash proteins called antibodies that detect foreign substances and keep them from invading cells. In some cases, however, people produce autoantibodies that can attack the body's own organs and tissues over time.

The Cedars-Sinai investigators found that people with prior infection with SARS-CoV-2, the virus that causes COVID-19, have a wide variety of autoantibodies up to six months after they have fully recovered. Prior to this study, researchers knew that severe cases of COVID-19 can stress the immune system so much that autoantibodies are produced. This study is the first to report not only the presence of elevated autoantibodies after mild or asymptomatic infection, but their persistence over time.

"These findings help to explain what makes COVID-19 an especially unique disease," said Justyna Fert-Bober, Ph.D., research scientist in the Department of Cardiology at the Smidt Heart Institute and co-senior author of the study. "These patterns of immune dysregulation could be underlying the different types of persistent symptoms we see in people who go on to develop the condition now referred to as long COVID-19."

To conduct their study, the Cedars-Sinai research team recruited 177 people with confirmed evidence of a previous infection with SARS-CoV-2. They compared blood samples from these individuals with samples taken from healthy people prior to the pandemic. All those with confirmed SARS-CoV-2 infection had elevated levels of autoantibodies. Some of the autoantibodies also have been found in people with diseases in which the immune system attacks its own healthy cells, such as lupus

and rheumatoid arthritis.

"We found signals of autoantibody activity that are usually linked to chronic inflammation and injury involving specific organ systems and tissues such as the joints, skin and nervous system," said Susan Cheng, MD, MPH, MMSc, director of the Institute for Research on Healthy Aging in the Department of Cardiology at the Smidt Heart Institute and co-senior author of the study.

Some of the autoantibodies have been linked to autoimmune diseases that typically affect women more often than men. In this study, however, men had a higher number of elevated autoantibodies than women.

"On the one hand, this finding is paradoxical given that autoimmune conditions are usually more common in females," Fert-Bober said. "On the other hand, it is also somewhat expected given all that we know about males being more vulnerable to the most severe forms of COVID-19."

The research team is interested in expanding the study to look for the types of autoantibodies that may be present and persist in people with long-haul COVID-19 symptoms. Because this study was in people infected before the advent of vaccines, the researchers will also examine whether autoantibodies are similarly generated in people with breakthrough infections.

"If we can better understand these autoantibody responses, and how it is that SARS-CoV-2 infection triggers and drives these variable responses, then we can get one step closer to identifying ways to treat and even prevent these effects from developing in people at risk," Cheng said.

More information: Yunxian Liu et al, Paradoxical sex-specific patterns of autoantibody response to SARS-CoV-2 infection, *Journal of*

Translational Medicine (2021). DOI: 10.1186/s12967-021-03184-8

Provided by Cedars-Sinai Medical Center