

Immunocompromised patients and COVID infections: Who's at risk?

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Early in the pandemic, clinicians noticed that certain immunocompromised patients were experiencing persistent SARS-CoV-2 infections, some lasting weeks to months at a time.

This raised concerns that one of these cases could be the source of an emerging viral variant that has benefited from an extended battle with

the [immune system](#).

A prospective study, "SARS-CoV-2 shedding and evolution in patients who were immunocompromised during the omicron period: a multicentre, prospective analysis," [published](#) in the journal *Lancet Microbe* provides more clarity on which patient populations are at higher risk for prolonged infections —and hints that this fear is likely unwarranted.

The study, led by Adam Luring, M.D., Ph.D., of the Division of Infectious Disease at Michigan Medicine, is part of the larger CDC-sponsored IVY Network study directed out of Vanderbilt University.

The collaborative team followed 150 [immunocompromised patients](#) with COVID infections from five United States health systems in 2022.

Each patient was surveyed and tested using nasal swabs collected from onset of SARS-CoV-2 infection until they tested negative.

"We were specifically looking at who was at risk for prolonged infection, such that they never cleared the virus," said Luring.

Immunocompromising conditions

The study participants had a diverse set of immunocompromising conditions, ranging from people with B-cell cancers or receiving anti-B cell therapy; solid organ or stem cell transplant recipients; people living with AIDS; and those with non-B cell cancers and autoimmune or autoinflammatory conditions.

The team found that just 25% of patients tested positive using the gold standard, highly sensitive PCR test for 21 days or longer after onset of illness.

Only 8% tested positive for live virus for 21 days or longer. The median time to last positive test overall was nine days.

"In [contrast](#) to a lot of case reports, we were finding that very few people had prolonged infection," said Luring.

Specifically, people living with AIDS and those with B-cell cancers, like certain leukemias and lymphomas, were more likely to have prolonged infections than patients with autoimmune disease or non-B cell cancers. And of the 59 enrolled patients with a solid organ transplant with T-cell immunosuppression, only one had an infection lasting longer than 56 days.

Extended infection also seemed to coincide with certain immunosuppressing therapies.

Importance of antibodies

Patients receiving treatment with rituximab or CAR-T therapy, which targets B cells, were more likely to have longer lasting infections—pointing to the importance of antibodies (which are produced by B [cells](#)) for immunity.

Importantly, the team also notes that mutations within the subset of patients who had prolonged infections rarely, if ever, matched those of variants circulating within the wider global community.

"A lot of what makes a successful virus is its ability to escape immunity," said Luring.

"However, immunity is heterogeneous—what might lead a virus to escape the immune system in an immunocompromised patient vs. patients at the population level are different."

Insight into who is at greatest risk

As global immunity shifts due to vaccination and [infection](#), surveillance of this particular patient population for new variants may not be practical, he explained.

The study provides much needed insight into which immunocompromised patients are at greatest risk, says Luring. He hopes the study will also lead to refocused efforts to develop better therapies for these [patients](#).

More information: Zoe Raglow et al, SARS-CoV-2 shedding and evolution in patients who were immunocompromised during the omicron period: a multicentre, prospective analysis, *The Lancet Microbe* (2024). DOI: [10.1016/S2666-5247\(23\)00336-1](https://doi.org/10.1016/S2666-5247(23)00336-1)

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