

Protection from Reinfection Provided by Prior Infection with SARS-CoV-2

As new variants of the [severe acute respiratory syndrome coronavirus 2](#) (SARS-CoV-2) continue to emerge, reports of vaccine breakthrough infections and reinfections rise, with one recent study in the U.S. discovering over 1,000 vaccine breakthrough infections following a mass gathering. Researchers from the University of Michigan investigated the correlation between SARS-CoV-2 infection and the severity of reinfections.



Study

In the current study, the researchers used blood samples and data from the Nicaraguan Household Influenza Cohort Study (HICS). Real-time reverse transcriptase-polymerase chain reaction (RT-PCR) assay was performed to confirm positive samples, whereas enzyme-linked immunosorbent assays (ELISAs) were run on paired samples, targeting the [SARS-CoV-2 spike protein](#) and receptor-binding domain (RBD).

The spike protein was used for titer estimates, whereas the RBD results were used for screening purposes. Seroconversion was measured in most cases, comparing current to baseline results; however, as a set of participants did not have baseline samples, the term seropositivity is used instead. RT-positive episodes that occurred over 60 days after an initial episode were considered separate [infections](#).

A [Poisson distribution](#) was used to calculate 95% confidence intervals for attack rates, risk ratios, and percent protection. Some results did not have numeric titers; therefore, the researchers set basic numerical values based on the screening results.

Antibody titers were separated into different categories and log-transformed for all analyses. A three-parameter logistic regression model was used, as it allowed some probability of infection at the highest [antibody titers](#). The Wilcoxon rank-sum tests were used to compare pre-existing antibody titers.

Findings

The current study examined 2,353 people in 437 households between March 2020 and October 2021. About 90.2% of individuals had ELISA results in March 2021. There were 539 [RT-PCR](#) confirmed infections between April and October 2021.

By March 2021, 1,322 individuals had tested positive for SARS-CoV-2, for seroprevalence of 62.3%. Of these individuals, 97.9% remained positive over time. No one in the cohort was [vaccinated](#) before March 2021.

The researchers compared the number of RT-PCR positive infections that occurred during the second wave amongst participants who were seropositive and compared these individuals to those who were seronegative in March 2021. Those who had previously been infected were protected from the second wave in most cases, with the highest protection found to be against severe [infection](#).

Previously infected individuals were 64.5% less likely to be infected at all and 79.4% less likely to become severely infected. This protection was less prevalent in children under the age of 10, although there were few severe or moderate cases in this group. Protection from repeated infection in children between the ages of 0-9 who were previously infected was 56.6%, whereas 51.0% were protected against [symptomatic infections](#).

Significantly lower antibody titers were found among RT-PCR positive individuals, symptomatic, and moderate or severe infections. Infection and symptoms did occur in individuals with high titers. An estimated protection of 50% and 80% from any SARS-CoV-2 infection correlated with [antibody](#) titers of 327 and 2,551, respectively.

When the researchers compared the severity of secondary infections to the first, they examined the spectrum of disease between the groups. In the [second wave](#), they identified 377 first infections and 162 secondary infections.

Second infections were significantly less severe than [first infections](#), with moderate or severe infections 0.6 times as likely and severe infections 0.4 times as likely. These reinfections were also twice as likely to be subclinical. Low mortality rates made it impossible to reach a statistically significant result on the difference in death rates.

Conclusion

The authors highlight that their study found seropositivity was associated with protection against infection in an area in which the [Gamma and Delta SARS-CoV-2](#) variants were the most common causes of new cases. They urge that the identification of antibody titers and their ability to convey certain levels of protection should be further investigated.

This information could help [public health](#) policymakers, vaccine manufacturers, and healthcare workers make informed decisions, and could even potentially be used to direct vaccines to individuals most at risk.

Source:

<https://www.news-medical.net/news/20211130/Prior-infection-with-SARS-CoV-2-continues-to-provide-protection-from-reinfection.aspx>