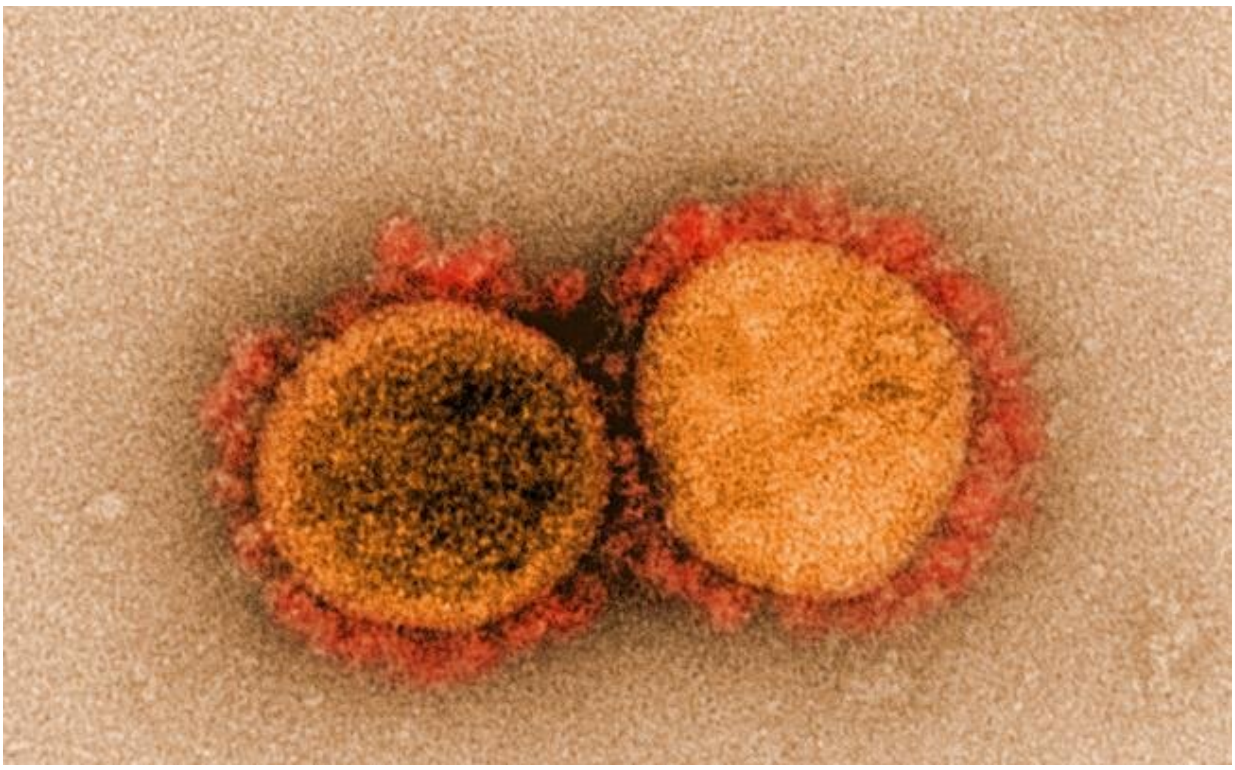
Immunocompromised pediatric patients showed T-cell activity and humoral immunity against SARS-CoV-2

May 13 2021



Transmission electron micrograph of SARS-CoV-2 virus particles, isolated from a patient. Image captured and color-enhanced at the NIAID Integrated Research Facility (IRF) in Fort Detrick, Maryland. Credit: NIAID

According to data from a cohort of adult and pediatric patients with

antibody deficiencies, patients that often fail to make protective immune responses to infections and vaccinations showed robust T-cell activity and humoral immunity against SARS-CoV-2 structural proteins. The new study, led by researchers at Children's National Hospital, is the first to demonstrate a robust T-cell response against SARS-CoV-2 in immunocompromised patients.

"If T-cell responses to SARS-CoV-2 are indeed protective, then it could suggest that adoptive T-cell immunotherapy might benefit more profoundly immunocompromised patients," said Michael Keller, M.D., director of the Translational Research Laboratory in the Program for Cell Enhancement and Technologies for Immunotherapy (CETI) at Children's National. "Through our developing phase I T-cell immunotherapy protocol, we intend to investigate if coronavirus-specific T-cells may be protective following bone marrow transplantation, as well as in other immunodeficient populations."

The study, published in the *Journal of Clinical Immunology*, showed that patients with antibody deficiency disorders, including inborn errors of immunity (IEI) and common variable immunodeficiency (CVID), can mount an immune response to SARS-CoV-2. The findings propose that vaccination may still be helpful for this population.

"This data suggests that many patients with antibody deficiency should be capable of responding to COVID-19 vaccines, and current studies at the National Institutes of Health and elsewhere are addressing whether those responses are likely to be protective and lasting," said Dr. Keller. The T-cell responses in all the COVID-19 patients were similar in magnitude to healthy adult and pediatric convalescent participants.

Kinoshita et al. call for additional studies to further define the quality of the antibody response and the longevity of immune responses against SARS-CoV-2 in immunocompromised patients compared with healthy

donors. Currently, there is also very little data on adaptive immune responses to SARS-CoV-2 in these vulnerable populations.

The study sheds light on the antibody and T-cell responses to SARS-CoV-2 protein spikes based on a sample size of six patients, including a family group of three children and their mother. All have antibody deficiencies and developed mild COVID-19 symptoms, minus one child who remained asymptomatic. Control participants were the father of the same family, who tested positive for COVID-19, and another incidental adult (not next of kin) experienced mild COVID-19 symptoms. The researchers took blood samples to test the T-cell response in cell cultures and provided comprehensive statistical analysis of the adaptive immune responses.

"This was a small group of patients, but given the high proportion of responses, it does suggest that many of our antibody deficient patients are likely to mount immune responses to SARS-CoV-2," said Dr. Keller. "Additional studies are needed to know whether other patients with primary immunodeficiency develop immunity following COVID-19 infection and will likely be answered by a large international collaboration organized by our collaborators at the Garvan Institute in Sydney."

More information: Hannah Kinoshita et al, Robust Antibody and T Cell Responses to SARS-CoV-2 in Patients with Antibody Deficiency, *Journal of Clinical Immunology* (2021). DOI: 10.1007/s10875-021-01046-y

Provided by Children's National Hospital

against SARS-CoV-2 (2021, May 13) retrieved 6 May 2024 from https://medicalxpress.com/news/2021-05-immunocompromised-pediatric-patients-t-cell-humoral.html