

Long COVID patients show signs of autoimmune disease a year after infection

September 21 2022



Portrait of researcher Dr Manali Mukherjee. Credit: Dr Manali Mukherjee / European Respiratory Society

Blood samples drawn from patients with long COVID who are still suffering from fatigue and shortness of breath after a year show signs of

autoimmune disease in those patients, according to a study published today in the *European Respiratory Journal*.

Autoimmune disease occurs when the immune system mistakenly attacks healthy parts of the body, instead of defending the body against disease. It causes conditions such as rheumatoid arthritis and lupus.

Researchers say this finding offers clues about the nature of long COVID that could ultimately lead to improvements in diagnosing and treating the condition.

The research was led by Dr. Manali Mukherjee from McMaster University, Ontario, Canada and Professor Chris Carlsten at the University of British Columbia, Vancouver, Canada. Dr. Mukherjee said, "Although long COVID is now recognized by bodies like the World Health Organization, we still know very little about why it develops or how we can help patients.

"I'm a respiratory researcher with a background in studying the immune system and when I experienced the symptoms of long COVID firsthand, I began to wonder about the role of the immune system in this condition."

To find out more, Dr. Mukherjee and her colleagues recruited 106 people who had been diagnosed with COVID-19 between August 2020 and September 2021 and were under the care of three hospitals in Canada (St. Joseph's Healthcare Hamilton, Vancouver General Hospital and St. Paul's Hospital, Vancouver). Researchers also included a group of 22 healthy volunteers and a group of 34 people who had experienced a non-COVID respiratory infection as a comparison.

On three occasions—3, 6 and 12 months after they recovered from the infection—patients were asked if they were suffering any shortness of

breath, coughing or fatigue (typical symptoms of long COVID). Most patients were still taking part in the study after 6 months (98 out of 106) while only 57 came back after 12 months. Researchers say this may be due to patients recovering.

Participants also gave blood samples. Researchers tested the samples for particular antibodies. Antibodies are normally produced by the immune system to stick to potentially harmful bacteria or viruses, marking them out for attack by other parts of the [immune system](#). In this case, the researchers looked for antibodies that target healthy cells and tissues in the body and that are known to contribute to [autoimmune diseases](#).

Nearly 80% of the COVID-19 patients had two or more of these antibodies in their blood three months and six months after the infection. This fell to 41% after a year. Most of the healthy volunteers had no sign of these antibodies in their blood and in those who had experienced a non-COVID respiratory infection, levels of these antibodies were comparatively low.

Researchers also found that two specific "[autoantibodies](#)" (called U1snRNP and SSb-La autoantibodies), along with other proteins (called [cytokines](#)) that cause inflammation, persisted in around 30% of COVID patients a year after infection. This tended to be among those patients who were also still suffering with fatigue and shortness of breath.

Dr. Mukherjee explains, "For the majority the patients in our study, even if they had autoantibodies soon after their infection, this resolved after 12 months. However, in some patients, autoantibodies persist, and these patients are more likely to continue suffering with symptoms and to need medical help.

"These results point towards the need to test for signs of autoimmune disease in patients with symptoms of long COVID that last for a year or

more."

Professor Carlsten added, "Our data on autoantibodies in those months following COVID infection buttresses that of other groups and provides strong plausibility for the presentation of long COVID as a systemic disease."

Dr. Mukherjee and her colleagues will now study long COVID patients over a period of two years to see how their levels of autoantibodies change in the longer term.

Dr. Eva Polverino from Vall d'Hebron University Hospital, Barcelona, Spain, is Head of the European Respiratory Society's Respiratory Infections Assembly and was not involved in the research. She said, "Millions of people around the world are suffering with long COVID and that is having an enormous socioeconomic impact. However, there is a lack of evidence on why some people develop the condition and how we can help patients recover.

"We know that certain infections can, in some cases, trigger longer-term autoimmune diseases such as rheumatoid arthritis. This study adds to growing evidence that similar processes may be involved in long COVID. Further work in this area could increase our understanding of long COVID and how best to diagnose and treat the condition."

More information: Circulating anti-nuclear autoantibodies in COVID-19 survivors predict long-COVID symptoms, *European Respiratory Journal* (2022). [DOI: 10.1183/13993003.00970-2022](https://doi.org/10.1183/13993003.00970-2022)

Provided by European Lung Foundation

Citation: Long COVID patients show signs of autoimmune disease a year after infection (2022, September 21) retrieved 6 May 2024 from <https://medicalxpress.com/news/2022-09-covid-patients-autoimmune-disease-year.html>

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