

Does Recovered COVID-19 Patients Have Protective Reactions in Subsequent Reexposures to the Virus?

Protective reactions or neutralized antibody produced after coronavirus disease 2019 (COVID-19) infection has a major impact on herd immunity induction and outbreak control. This feature potentially can open up unique opportunities for disease management.^[1]

Some of the recovered COVID-19 patients had shown re-positive by polymerase chain reaction (PCR) test results after discharge from the hospital. There are several reasons why recovered COVID-19 patients re-positive for Coronavirus 2 (CoV-2) including (1) false-negative results of pharyngeal swabs before the patient was discharged from the hospital, due to low sensitivity, sampling procedures, temperature, transportation, and quality of kits.^[2] (2) Dead viruses or gene fragments maybe send a positive signal of viral RNA without active viral replications. (3) It might be some of the COVID-19 patients did not completely meet the actual discharge criteria. The large time interval between the viral RNA tests before discharge and the actual discharge date induces the viral RNA tests unrepeatability.^[3,4] However, the antibody responses against COVID-19 are poorly understood and the main question is the reinfection possibility of recovered patients with the subsequent reexposures.

As we discussed above, many discharged patients from the hospital have re-positive results for Severe Acute Respiratory Syndrome Coronavirus 2 RNA. Several studies indicated that COVID-19 infection induces protective reactions to CoV-2.^[3] Re-positive Reverse-Transcriptase Polymerase Chain Reaction (RT-PCR) proportion test was 13.61% in China among COVID-19 recovered patients.^[5] In contrast, very low levels of neutralized antibodies were reported in some of the COVID-19 patients. These issues raised reinfection possibility of SARS-CoV-2 and enhancement of antibody-dependent process.^[6]

Recently, an animal study has shown promising avenues for COVID-19 protection that the history of CoV-2 infection may protect from subsequent reexposures. In this study, all primary specimens obtained from monkeys did not find viral loads in nasopharyngeal, anal swabs and viral replication at 5 days post-reinfection.^[7]

Studies have shown that, after encountering with the virus, immunoglobulin G (IgG) antibody peaked at month 4, IgG antibodies appearance lasted for 13 months, and specific neutralizing antibodies of COVID-19 were detected 10–15 days after onset of symptoms and remained for several months. Despite these antibody titers were variable in different patients, they are related to the spike-binding antibodies targeting S1, receptor-binding domain (RBD),

and S2 regions.^[8] Another study has shown positive IgG test among all 285 patients with CoV-2, 19 days after symptoms onset or being infected by COVID-19.^[9] Likewise, in a cohort study of 16 COVID-19 patients, seropositivity proportions were 100% for anti-(RBD) IgG, 15 patients for both anti-RBD Immunoglobulin M and anti-internal nucleoprotein (NP) IgG, and 14 patients for anti-NP IgM and these levels associated with virus naturalization titer.^[10]

Therefore, immunity to COVID-19 is likely to last several months but whether it can prevent reinfection is still unclear. Large longitudinal and cohort studies are needed in patients with COVID-19 for long-term follow-up to obtain valid information about the possibility of reinfection and naturalized antibodies in reexposures.

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Conflicts of interest

There are no conflicts of interest.

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