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Short Communication

Lasting Immunity Found in Patients: After Post SARS-CoV-2 Infection Functional Recovery

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ABOUT THE STUDY

More than two years have passed since the first reported case of the novel coronavirus disease 2019 (COVID-19), which has already claimed more than 10 million, lives worldwide. Fortunately, vaccines against Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) have been developed at record-breaking speeds, and vaccine programs to control the epidemic continue worldwide. During this extension of research from treatment to COVID-19 prevention, the immune avoidance mechanism and the immune pathogenic nature of SARS-CoV-2 add uncertainty to the effectiveness of this global vaccination effort. During natural infection, SARS-CoV-2 can prevent the natural antiviral response mediated by Interferons (IFNs) through a range of possible strategies, leading to viral replication and spread as well as delaying or weakening the positive immune response, including T cell and antibody responses. The significant prevalence of SARS-CoV-2 RNA re-positive cases in discharged patients raises further concern about the impact and persistence of immune responses after natural infection. However, here we discussed pre and postcovid-19 infection immunity and their recovery rate.

After people recover from infection with a virus, the immune system retains a memory of it. Immune cells and proteins that circulate in the body can recognize and kill the pathogen if it's encountered again, protecting against disease and reducing illness severity. This long-term immune protection involves several components. Antibodies-proteins that circulate in the blood recognize foreign substances like viruses and neutralize them. Different types of T cells help recognize and kill pathogens [1,2]. B cells make new antibodies when the body needs them. All of these components of the immune system have been found in people who have recovered from SARS-CoV-2, the virus that causes COVID-19. But the details of this immune response and how long it lasts after infection are unclear. Scattered reports of re-infection with SARS-CoV-2 raise concerns that the immune response to the virus may not be sustainable. To better understand the immune memory of SARS-CoV-2, immune cells and antibodies were analyzed from approximately 200 individuals who were exposed and recovered from SARS-CoV-2 [3]. The time from infection to six days to eight months after the onset of symptoms. More than 40 participants recovered more than six months before the start of the study. About 50 people donated blood samples more than once after infection.

The researchers found lasting immune responses in the majority of individuals studied. Antibodies against the spike protein of SARS-CoV-2, which is used to enter virus cells, were detected in 98% of participants one month after the onset of symptoms. As seen in previous studies, the number of antibodies varies widely between individuals [4]. But, hopefully, their levels were very stable over time, only moderately declining for 6 to 8 months after infection. Virus-specific B cells multiply over time. Six months after the onset of symptoms more than one month later B memory cells were present. Although the number of these cells appears to have reached the plateau a few months later, the levels did not decrease during the study period. Levels of T cells for the virus also remained high after infection. Six months after the onset of symptoms, 92% of participants had $CD4^+$ T cells that could detect the virus. These cells help coordinate the immune response. Half of the participants had $CD8^+$ T cells, which kill the infected cells. Like antibodies, the numbers of different immune cells vary considerably between individuals. Differences in sex or disease severity are not the cause of this difference. However, 95% of individuals have at least 3 out of 5 immune system components that can detect SARS-CoV-2 up to 8 months after infection [5,6].

CONCLUSION

Significant immune memory is produced after COVID-19, which includes four main types of immune memory. Approximately 95% of subjects had immunocompromised memory after infection. Circulating antibody titers did not predict T cell memory. Therefore, routine serological tests for SARS-CoV-2 antibodies do not reflect the superiority and durability of immune memory to SARS-CoV-2. This work tells an understanding of immune memory in humans and suggesting that a protective immunity against SARS-CoV-2 and recurrent COVID-19.The immune systems of more than 95% of

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people who recovered from COVID-19 had durable memories of the virus up to eight months after infection. It is hoped that individuals receiving the SARS-CoV-2 vaccine will develop similar permanent immune memories after vaccination.

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