Second vaccine dose needed for individuals infected with COVID-19 shortly after the first dose

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A second dose of the COVID-19 vaccine should be offered to individuals infected with the virus shortly after receiving the first dose,

according to findings recently published by the Azrieli Faculty of Medicine of Bar-Ilan University and Ziv Medical Center.

The study, published in the journal *Epidemiology & Infection*, tracked a cohort of 541 Ziv Medical Center health care workers—some of whom had already recovered from COVID-19—to determine how those previously infected with COVID-19 responded to vaccination compared to those who weren't infected.

In this joint study, health care workers at Ziv Medical Center, one of the main hospitals in northern Israel, regularly provided blood samples to measure their antibody levels following vaccination. A number of differences emerged following sample analysis of individuals infected pre- and post-vaccination, and those who were never infected.

Previously infected individuals who received one dose of the vaccine had much higher IgG antibody levels than fully vaccinated workers who were never infected. However, infection after the first dose (and before the second) did not increase IgG levels, and individuals infected after the first dose who never received the second had similar antibody levels to those who received one dose and were never infected. Individuals in the cohort infected post-vaccination had IgG antibody levels at 21 and 50 days similar to those never infected who received the same number of doses and much lower than those infected pre-vaccination.

"Our study suggests that two doses of vaccine are needed in those who were infected shortly after the first dose," says epidemiologist Prof. Michael Edelstein, of Bar-Ilan University's Azrieli Faculty of Medicine. "Although it was conducted on a small cohort, our data suggest that a second dose provides optimal protection to those patients infected between doses," he adds. Edelstein collaborated with Dr. Kamal Abu-Jabal, of Ziv Medical Center and the Azrieli Faculty of Medicine, and a team of colleagues from the hospital and the medical school.

The researchers stress that larger studies should confirm or refute the need for a second dose of COVID-19 vaccine in these individuals, in particular in the context of emerging variants against which vaccines are less effective.

The current findings build upon research published in February 2021 in the journal *Eurosurveillance*. In that study, on the same cohort of health care workers, the researchers reported evidence that those previously infected with the virus responded very strongly to one dose of the Pfizer vaccine, regardless of when they were infected and whether or not they had detectable antibodies against COVID-19 prior to receiving the vaccine.

Prof. Edelstein and colleagues are continuing to follow the cohort's antibody response and immune system response, as well as the response to the third dose for those who receive it.

More information: Kamal Abu Jabal et al, SARS-CoV-2 Immunogenicity in individuals infected before and after COVID-19 vaccination: Israel, January-March 2021, *Epidemiology and Infection* (2021). DOI: 10.1017/S0950268821001928

Kamal Abu Jabal et al, Impact of age, ethnicity, sex and prior infection status on immunogenicity following a single dose of the BNT162b2 mRNA COVID-19 vaccine: real-world evidence from healthcare workers, Israel, December 2020 to January 2021, *Eurosurveillance* (2021). DOI: 10.2807/1560-7917.ES.2021.26.6.2100096

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