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LETTER TO THE EDITOR

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Is a single dose of mRNA vaccine sufficient for COVID-19 survivors?

Dear Editor,

Amidst the evolving COVID-19 pandemic and its precarious conditions that have impacted the worldwide community, the need to achieve herd immunity through immunization has become the only resort to control this horrendous pandemic. The shortage and limited supply of COVID-19 vaccines remain a major pushback to tackle the infection and achieve partial normalcy. At present, there have been more than 111 million confirmed cases of COVID-19, around 63 million recovered from the infection, and over 2.4 million related deaths globally.[1] However, a recent study has brought some hope by showing that a single dose of mRNA COVID-19 vaccine, either mRNA-1273 (Moderna) or BNT162b2 (Pfizer/BioNTech), can provide a considerable protection rate against SARS-CoV-2 infection reaching around 75% at 15 days after the first dose and up to 83% after 36 days.[2] Another study conducted by Amit et al.[3] showed a substantial adjusted rate reduction of COVID-19 infection of 85% between days 15–28 following the first Pfizer vaccine dose administration.

On the other hand, more studies showed that adult patients who recovered from COVID-19 infections have elicited protective immunity against reinfection lasting several months (up to 7 months) following primary infection.[4,5] Given the scarcity of data and the lack of recommendations regarding the optimal timing for vaccine administration following a COVID infection, and considering the low risk for reinfection and the limited vaccine supply, CDC suggested temporarily delay the vaccination of subjects with a recent history of SARS-CoV-2 infection.[6] Also, given the absence of comparative data evaluating the clinical and biologic response to vaccines among patients with previous COVID-19 infection versus those who are infection naïve, it remains unknown if a single vaccine dose would be sufficient for patients who have recovered from the infection.

Hence, assessing the clinical benefits of mRNA vaccines in patients who recovered from COVID-19 is of utmost importance given the urgent global need for vaccines particularly for the most vulnerable groups. In light of these potential benefits, we propose a placebo-controlled randomized clinical trial that would enroll patients at 3 months post-COVID-19 infection and divide them into three arms (Figure 1). Primary endpoints, in addition to reinfection episodes and disease severity, should include the measurement of neutralizing SARS-CoV-2 antibodies at the time of randomization, 3 weeks after the first shot, and 3 months after the second shot. Because the majority of the population in the United States and worldwide are unvaccinated, we argue whether previously COVID-19-infected patients should receive one single dose of vaccine that could serve as a booster for their immune systems, so there will be

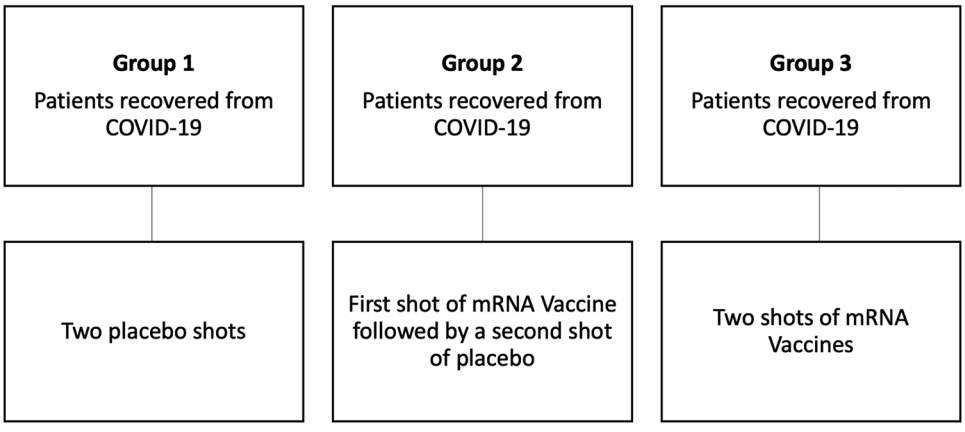

FIGURE 1 Flow diagram of suggested randomized clinical trial in COVID-19 survivors.

more opportunities for more people who were not exposed to the infection to get their first shot and mount a partial immunity.

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REFERENCES

1. COVID-19 Map - Johns Hopkins Coronavirus Resource Center. https://coronavirus.jhu.edu/map.html. Accessed February 24, 2021.
2. Pawlowski C, Lenehan P, Puranik A, et al. FDA-authorized COVID-19 vaccines are effective per real-world evidence synthesized across a multi-state health system. *medRxiv*. 2021. https://doi.org/10.1101/2021.02.15.21251623
3. Amit S, Regev-Yochay G, Afek A, Kreiss Y, Leshem E. Early rate reductions of SARS-CoV-2 infection and COVID-19 in BNT162b2 vaccine recipients. *Lancet*. 2021;397(10277):875-877.
4. Abu-Raddad LJ, Chemaitelly H, Malek JA, et al. Assessment of the risk of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) reinfection in an intense reexposure setting. *Clin Infect Dis*. 2020.
5. Abu-Raddad LJ, Chemaitelly H, Coyle P, et al. SARS-CoV-2 reinfection in a cohort of 43,000 antibody-positive individuals followed for up to 35 weeks. *medRxiv*. 2021. https://doi.org/10.1101/2021.01.15.21249731
6. Interim Clinical Considerations for Use of mRNA COVID-19 Vaccines|CDC 2021 Feb 21.