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CORRESPONDENCE

Reply

We thank Dr. Lo for the interest in our manuscripts that explored the association of COVID-19 vaccination and mortality.[1,2] As correctly pointed out, the study reflects the distribution of cirrhosis in the entire Veterans Health Administration without a referral or tertiary care bias.[1–3] Therefore, as expected, the majority of participants included in both studies had compensated cirrhosis.

Our results showed that, among patients with compensated cirrhosis, postvaccination COVID-19 was associated with an 81% reduction in hazard of death [adjusted hazard ratio (aHR) 0.19, 95% confidence interval (CI) 0.08–0.45, $p = 0.0001$] and 84% reduction in COVID-19–related death (aHR 0.16, 95% CI 0.06–0.46, $p = 0.0001$).[1] Among patients with decompensated cirrhosis, postvaccination COVID-19 was associated with a 73% reduction in hazard of death (aHR 0.27, 95% CI 0.08–0.90, $p = 0.03$) but not COVID-19–related death (aHR 0.51, 95% CI 0.14–1.88, $p = 0.31$). We believe that the lack of significance with COVID-19–related death among participants with decompensated cirrhosis is likely a Type II error; the power to identify differences between postvaccination and unvaccinated COVID-19 in this subgroup was only 48.7%, and the sample size required to identify differences between the two groups with 80% power was 366, which was higher than our study sample. Our retrospective study was not designed to identify vaccine safety.

However, a follow-up study from our group using data from the same cohort compared vaccination-induced immunity and infection-induced immunity among participants with cirrhosis and was adequately powered.[4] The vaccine-associated immunity group was fully vaccinated participants with cirrhosis with no documented severe acute respiratory syndrome coronavirus 2 infection. The infection-induced immunity group was unvaccinated participants who had prior COVID-19. A subgroup analysis among the participants with decompensated cirrhosis in this study showed that vaccine-induced immunity was associated with a reduction in odds of developing COVID-19 [adjusted odds ratio (aOR) 0.10, 95% CI 0.07–0.13, $p < 0.0001$] and symptomatic (aOR 0.49, 95% CI 0.35–0.70, $p < 0.0001$), moderate/severe/critical (aOR 0.42, 95% CI 0.26–0.69, $p = 0.0004$), and severe or critical COVID-19 (aOR 0.15, 95% CI 0.07–0.31, $p < 0.0001$) compared with infection-induced immunity. This study, done later in the pandemic, had a larger sample size and more outcomes to demonstrate statistical significance.

The above findings suggest that COVID-19 vaccines appear to be protective among participants with decompensated cirrhosis in an adequately powered study cohort, but we agree with the need for more studies in this highly vulnerable population.

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CONFLICT OF INTEREST

Nothing to report.

DISCLAIMER

The authors prepared this work in their personal capacity. The opinions expressed in this article are the author's own and do not reflect the view of the Department of Veterans Affairs or the United States government.

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