

Protecting Patients With Cirrhosis From Coronavirus Disease 2019: Identifying Gaps in Vaccination Rates

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The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic has resulted in the deaths of more than 600,000 Americans to date and millions more worldwide. The rapid development of multiple vaccines with exceedingly high (>90%) efficacy at preventing death from SARS-CoV-2 is one of the recent miracles of medicine. Early vaccination efforts targeted those with the highest risk of contracting and/or dying from SARS-CoV-2, including the elderly and those with chronic medical conditions (eg, cancer, immunosuppression). Although their risk of mortality attributed to coronavirus disease 2019 (COVID-19) disease is not as high as those with other chronic conditions, patients with cirrhosis and COVID-19 have a significantly higher mortality than those without cirrhosis.⁽¹⁾ Thankfully, despite lower response rates to other vaccines, the SARS-CoV-2 vaccine has shown similar efficacy with respect to protection against severe COVID-19 or death among patients with cirrhosis.⁽²⁾

Unfortunately, vaccination rates in the United States, despite broad access to free vaccines for all adults, have lagged behind other countries (eg, Canada, Israel). Given the increased risks of mortality from COVID-19 among patients with cirrhosis that are negated by vaccination, it is critical to quantify vaccination rates and to identify populations with decreased rates to enact targeted interventions.

To evaluate vaccination rates in a national sample of patients with cirrhosis, Mahmud et al. performed a retrospective cohort study of patients with cirrhosis receiving care in the Veterans Health Association (VHA)⁽³⁾ who were part of the Veterans Outcomes and Costs Associated With Liver Disease cohort.^(4,5) Among 43,122 patients with cirrhosis in their cohort, 25,875 (60.0%) of patients had received a SARS-CoV-2 vaccination between December 18, 2020, and June 15, 2021, with nearly 95% receiving the Pfizer-BioNTech (New York) or Moderna (Cambridge, MA) vaccines. In multivariable models, they found that age, race, smoking status, and rural/urban residence were significantly associated with receipt of vaccination. The investigators then generated predicted probabilities to categorize the cohort into 3 groups based on predicted vaccination rates based on demographic and clinical characteristics. The patients categorized as the under-vaccinated cohort (defined as a predicted vaccination rate of less than 50%) were the following: (1) younger (median age 57 years, compared with 72 years in those in a high vaccination cohort who had >70% vaccination), (2) more likely to be White (81.5% versus 41.3% in the >70% vaccination cohort), (3) more likely to be a current or former smoker (70.7% were former or current smokers versus 56.7% in >70% cohort), (4) more likely to be a resident in the Southeast (69.4% lived in the Southeast versus 4.1% in the >70% cohort), and (5) more likely to reside in a rural area (7.7% resided in a rural area versus 2.4% in >70% cohort).⁽³⁾

These data are not only informative in terms of identifying populations at risk but also concerning as many groups at risk of the most severe consequences

Abbreviations: COVID-19, coronavirus disease 2019; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2; VHA, Veterans Health Association.

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of COVID-19 are those with the lowest vaccination rates. Among the biggest risk factors for COVID-19 mortality is increasing age, and vaccination rates among patients with cirrhosis were highest among those >70 years of age. However, another key risk factor for COVID-19–related hospitalization and mortality is cigarette smoking, and vaccination rates were significantly lower among current or former smokers.⁽⁶⁾ There have been well-documented disparities in rates of infection and mortality from COVID-19 among racial and ethnic minorities during the past 18 months, in part related to the hospitals where patients were admitted.^(7,8) Reassuringly, these data from the VHA show an inverse association, with overwhelmingly lower vaccination rates among White non-Hispanics.⁽³⁾ Geographically, the findings of this study mirror what is being seen in the broader population, with the lowest vaccination rates nationally being seen among rural patients in the Southeast.

As the authors acknowledge, these data have limitations—most notably the potential for patients to have been vaccinated outside the VHA system. However, although this may have led to an underestimation of overall vaccination rates, it would be expected to have been nondifferential and if anything biased the among-group comparisons toward the null. In addition, administrative data do not allow for an understanding of why patients remain unvaccinated, which is an essential issue in the race to vaccinate and protect these vulnerable patients. Although the motivation to avoid vaccination could stem from concerns about adverse effects, prior COVID-19 infection, a lack of understanding of the benefits of subsequent vaccination, and misinformation from the media and/or social media, additional work is needed to understand this complex topic if more universal vaccination is to be achieved.⁽⁹⁾ Regardless of the cause, these vaccination rates among an at-risk population with cirrhosis, especially among those with additional risk factors (eg, smoking) is reason for great concern.

We undoubtedly believe that vaccination against SARS-CoV-2 is critical for all eligible people ages 12 and older in order to do all that we can to limit the cumulative toll of this pandemic on people throughout the world. Universal vaccination continues to be our best and only tool to allow for resumption of critical human activities without additional mass casualties or the evolution of progressively more challenging viral variants. The vast majority of COVID-19–related

deaths in the United States is now solely among those who are not fully vaccinated. It is no surprise, therefore, that the region of the United States with the lowest vaccination rates, in cirrhosis and in the general population, is the same region of the country now facing the most dramatic rise in viral transmission and associated hospitalization and death. Vaccination may be even more critical on an individual level among at-risk patients with chronic conditions such as liver disease. The approved vaccines have been shown to be safe and efficacious, without increased risk of adverse events compared with the general population, with similar efficacy. As physicians, it is critical we include discussions about this, and other lifesaving vaccines, with our patients and educate them on the risks and benefits while correcting the vaccine misinformation that is present in some media outlets and online social media.⁽⁹⁾ These data help to identify patients with cirrhosis who may be most at risk to falling prey to vaccine misinformation, including rural residents in the Southeast, a phenomenon that is becoming far too common in the broader US population.⁽⁹⁾ However, although it is important that patients are vaccinated to prevent serious COVID-19 infection or death, we would argue that it is just as important that providers of health care for these vulnerable patients are also universally vaccinated. This would serve as a powerful example to our patients of how to do the right thing and care for their health, thereby protecting our patients while helping to encourage them to ultimately get vaccinated themselves. Lastly, some transplant centers have made vaccination for SARS-CoV-2 mandatory for patients on the waiting list, with limited exclusions (eg, acute liver failure, acutely decompensated cirrhosis with high Model for End-Stage Liver Disease scores) given the higher vaccine response rates before transplant and the increased risk of posttransplant complications from COVID-19. This evidence-based mandate is one we support, and it is comparable with other medical evaluation requirements (eg, cancer screening based on a patient's age) and is ethically sound as it is in the best interest of the patient and the donor allograft.

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