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Third COVID-19 vaccine dose is highly effective in patients with cirrhosis

Results of a retrospective study of 26,000 patients published in the Journal of Hepatology show that receiving a third dose of the vaccine was associated with an 80% reduction in overall COVID-19 and 100% reduction in severe course of the infection or death

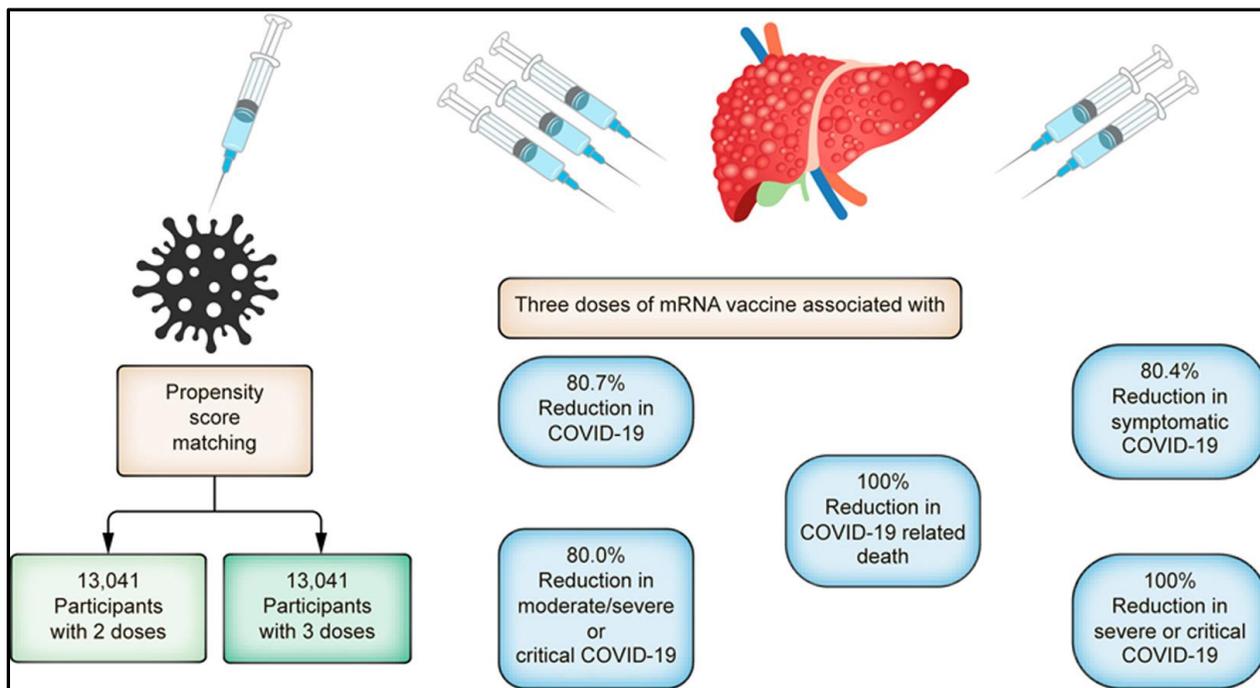
Amsterdam, October 19, 2022 – Cirrhosis of the liver is associated with decreased responsiveness to COVID-19 mRNA vaccines as evidenced by results after two doses. However, the results of a [new study](#) strongly support giving the recommended booster vaccinations to these patients. In this retrospective study of over 26,000 patients with cirrhosis, investigators found there was an 80% reduction in COVID-19 occurrence, 100% reduction in severe or critical COVID-19, and 100% reduction in COVID-19–related death. Their findings are reported in the [Journal of Hepatology](#).

“Our group previously demonstrated that in patients with cirrhosis, the effectiveness associated with two doses of an mRNA vaccine was lower and slower compared to that seen in a healthy population,” explained lead investigator Binu V. John, MD, MPH, Division of Gastroenterology and Hepatology, Miami VA Medical System, and Division of Digestive Health and Liver Disease, Department of Medicine, University of Miami Miller School of Medicine, Miami, FL, USA. “Patients with cirrhosis are particularly vulnerable to the impact of COVID-19, presenting higher hospitalization and mortality rates compared to those without liver disease. These findings inspired us to focus on the next question: What is the additional benefit of booster doses in cirrhosis, and particularly against the delta and omicron variants.”

Investigators performed a retrospective cohort study of patients with cirrhosis who received two or three doses of either the Pfizer BNT162b2 mRNA or Moderna mRNA-1273 vaccines at the Veterans Health Administration between December 18, 2020 and February 11, 2022, when the delta and omicron variants were active. Around 13,000 participants who received three doses of the vaccine were propensity-matched with 13,000 controls who had received two doses.

Patients who received three doses were evaluated for the development of COVID-19 and disease severity.

Results indicated that patients with cirrhosis should be encouraged to receive a third dose for effective protection because it appears to be highly effective against severe outcomes of COVID-19. The findings showed that the receipt of the third dose of either the BNT162b2 mRNA or the mRNA-1273 vaccines is associated with an 80% decrease in the development of COVID-19 and symptomatic COVID-19, and a 100% reduction in severe or critical COVID-19 and COVID-19--related death, compared to participants with cirrhosis who received only 2 doses.



Caption: Comparison between three versus two doses of mRNA COVID-19 vaccines and COVID-19 and severity in patients with cirrhosis. The study concluded that giving a third dose was associated with a significant reduction in cases of COVID-19 suggesting that the third dose can overcome lower vaccine response in patients with cirrhosis (Credit: John, et al. *Journal of Hepatology*).

“This reduction associated with the third dose is significantly higher than that described in a healthy population and suggests that a third dose of the COVID-19 mRNA vaccine is able to overcome the vaccine hyporesponsiveness in cirrhosis,” noted Dr. John. “This study suggests that a third dose of an mRNA vaccine is able to offer significant protection against COVID-19, and particularly against severe disease. The vaccine was observed to be protective in both patients with compensated cirrhosis (where the liver function is relatively preserved and patients have no symptoms of liver disease), and decompensated cirrhosis (when liver disease is worse and associated with symptoms), but the magnitude of reduction was greater in patients with compensated cirrhosis. It adds to the growing body of evidence demonstrating the importance of COVID-19 vaccination in cirrhosis.”

The investigators noted that their findings were surprising. “We had anticipated that the third dose may offer greater protection compared to two doses. However, the magnitude of reduction was remarkable, and even greater than seen in the healthy population. Our results show that patients with cirrhosis should definitely receive the third vaccination dose, and potentially all boosters now recommended,” concluded Dr. John.

Cirrhosis of the liver is the impaired liver function caused by the formation of scar tissue known as fibrosis due to damage caused by liver disease. It is associated with decreased responsiveness to most vaccines, including against COVID-19.

Notes for editors

The article is “Third dose of COVID-19 mRNA vaccine appears to overcome vaccine hyporesponsiveness in patients with cirrhosis,” by Binu V. John, MD, MPH, Raphaella D. Ferreira, MD, Akash Doshi, BS, David E. Kaplan, MD, Tamar H. Taddei, MD, Seth A. Spector, MD, Elizabeth Paulus, MD, Yangyang Deng, MS, Dustin Bastaich, and Bassam Dahman, PhD (<https://doi.org/10.1016/j.jhep.2022.07.036>). It appears in the *Journal of Hepatology*, volume 77, issue 5 (November 2022) published by [Elsevier](#).

The article is openly available at [https://www.journal-of-hepatology.eu/article/S0168-8278\(22\)03002-1/fulltext](https://www.journal-of-hepatology.eu/article/S0168-8278(22)03002-1/fulltext).

Full text of this article is available to credentialed journalists upon request; contact Freya Weise at +33 (6) 28 51 59 51 or hmsmedia@elsevier.com. Journalists wishing to interview the authors should contact Binu V. John, MD, MPH, at Binu.John@miami.edu.

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The *Journal of Hepatology*, the premier journal devoted to liver diseases, is the official journal of the European Association for the Study of the Liver (EASL). It publishes original papers, reviews, case reports, and letters to the Editor concerned with clinical and basic research in the field of hepatology. The journal has a 2021 Impact Factor of 30.083 (Source: Journal Citation Reports™ from Clarivate, 2022). www.journal-of-hepatology.eu

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