COVID-19 Vaccine Protection Against Long COVID: a Statewide Cohort Analysis

849

Xueying Yang[1], Ziang Liu[1], Jiajia Zhang[1], Bankole Olatosi[1], Sharon Weissman[1], Xiaoming Li[1]
[1]University of South Carolina, Columbia, South Carolina, USA

BACKGROUND

- Literature suggests that prior vaccination could reduce the prevalence of long COVID.
- Nevertheless, breakthrough COVID-19 cases could also have persistent symptoms after infection (e.g., 19% had persistent symptoms at >6 weeks).
- The evidence is sparse regarding the vaccine protection against long COVID.

AIMS

- This study aims to systematically investigate the association between different vaccination status on a series of long COVID conditions by organ system.

METHODS

- We identified COVID-19 positive adults between March 17, 2021 and January 15, 2022 from the statewide COVID-19 tester cohort. Setting the date of first positive SARS-CoV-2 as the index time (T0), we selected the individuals who were alive at least 30 days after T0.
- A total of 132 individual long COVID conditions were ascertained through ICD-10 codes from day 30 after T0 until a maximum of 180 days of follow-up.
- Individuals were classified as: partial-, fully-, and boosted vaccination before T0.
- We employed Cox regression models to estimate the hazard ratio of the risks of individual sequelae by vaccination status, adjusting for relevant covariates. The incident symptoms or conditions that were significantly associated with vaccination status were grouped by organ systems.

RESULTS

- Among 246,508 subjects, the prevalence of any long COVID conditions was 26.03%, with no major differences across the pandemic waves (i.e., 26.0% in Alpha, 25.78% in Delta, and 26.50% in Omicron dominant period).
- With a reference group of unvaccinated individuals, individuals with any dose of vaccination were associated with lower odds of 68 individual sequelae conditions, which involve 11 organ systems.

We observed that fully or boosted vaccination appears to have some protection against the development of multiple long COVID outcomes. This was common for symptoms in the respiratory system, genitourinary system, or mental, behavioral and neurodevelopmental disorders.

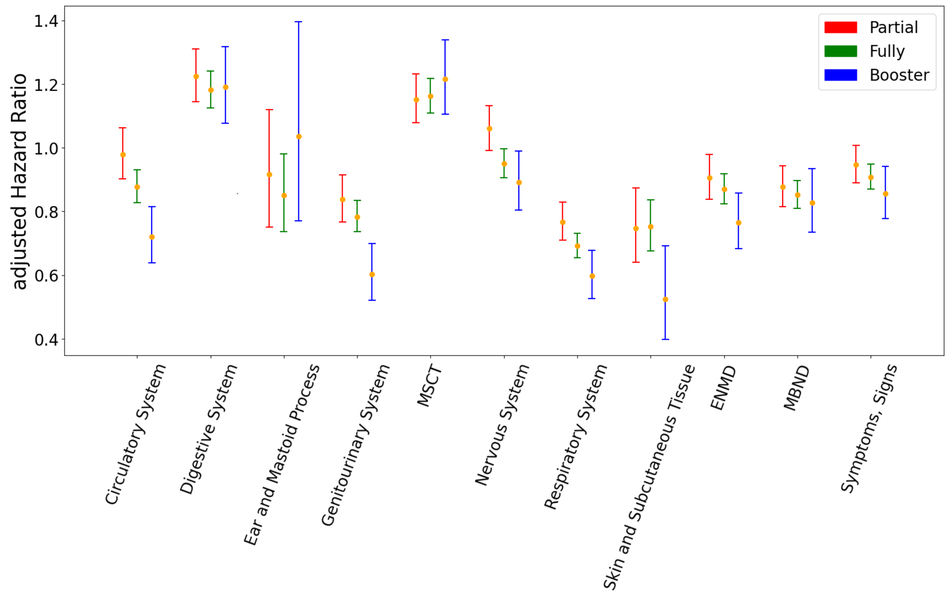


Figure 1 The association between vaccination status and long COVID sequelae by organ system

Note: "MSCT": Musculoskeletal System and Connective Issue; "ENMD": Endocrine, Nutritional and Metabolic Diseases; "MBND": Mental, Behavioral and Neurodevelopmental Disorders; "Symptoms, signs": Symptoms, Signs and Abnormal Clinical and Laboratory Findings, Not Elsewhere Classified.

RESULTS (continued)

- A decreased risk of the disease of the Respiratory System was observed for individuals with fully vaccination (adjusted hazard ratio [aHR]: 0.75, 95%CI: 0.68, 0.84) and booster vaccination (aHR: 0.60, 95%CI: 0.53-0.68). (Figure 1)
- Likewise, a reduced risk was also observed for the diseases of the Circulatory System (fully: aHR: 0.88, 95%CI: 0.83-0.93; booster: aHR:0.72, 95%CI: 0.64-0.81), Skin and Subcutaneous Tissue (fully: aHR:0.75, 95%CI: 0.68, 0.84; booster: aHR: 0.52, 95%CI: 0.40-0.69).

CONCLUSIONS

- Compared to no vaccination, fully or boosted vaccination were associated with lower long COVID prevalence.
- Our findings highlighted the importance to promote vaccine coverage in preventing long COVID and post-acute COVID-19 care strategies, particularly in certain organ systems (e.g., respiratory system, genitourinary system).
- Limitations include that the diagnosis of long COVID conditions might not be accurate by solely reliant on ICD codes in EHR data.

ACKNOWLEDGEMENTS

The research reported in this poster was supported by the National Institute of Allergy and Infectious Diseases of the National Institutes of Health under Award Number R21AI170159-01A1(XY). The authors thank the Department of Health and Environmental Control (DHEC), the office of Revenue and Fiscal Affairs (RFA), and other agencies for contributing the data in South Carolina.

AUTHOR CONTACT INFORMATION

Xueying Yang, PhD
Department of Health Promotion, Education and Behavior
Arnold School of Public Health
University of South Carolina
Email: xueyyang@mailbox.sc.edu

Big Data Health Science Center
UNIVERSITY OF SOUTH CAROLINA