HIV and COVID-19: Review of Clinical Course and Outcomes

Lauren K. Barbera, MPH; Kevin F. Kamis, MPH; Sarah E. Rowan, MD; Amelia J. Davis; Soraya Shehata; Jesse J. Carlson; Steven C. Johnson, MD; Kristine M. Erlandson, MD, MS

University of Colorado School of Medicine, Denver Health Medical Center, Denver Public Health

Background

- When COVID-19 surfaced in 2019, healthcare officials and providers assumed that individuals with HIV infection and other immunocompromising conditions would be at particularly high risk of both acquisition and severe disease.
- Without effective antiretroviral therapy (ART), HIV leads to depletion of CD4 T-lymphocytes, resulting in a weakened adaptive immune response.
- In the presence of effective ART, the cellular immune response recovers to variable degrees; however, individuals with HIV appeared to remain at greater risk for many infections.
- Researchers were uncertain about the role of HIV in contributing to COVID-19 acquisition and disease severity.

Aims

- To better understand what was known about the relationship between HIV and COVID-19 acquisition and disease severity.
- To summarize current research on COVID-19 among People with HIV (PWH) as published through July 2021.

Methods

- A literature review was conducted of all existing articles that reported data or opinions on SARS-CoV-2 and HIV coinfection.
  - 215 articles
  - PubMed, Scopus, preprint databases (medRxiv, bioRxiv), and references of existing publications
  - Key terms used: “COVID-19” OR “SARS-CoV-2” OR “coronavirus” AND “HIV” OR “Human Immunodeficiency Virus” OR “AIDS” OR “Acquired Immunodeficiency Syndrome”

2021 Conclusions

- Initial case series and cohort studies found no increased risk for SARS-CoV-2 infection or severe COVID-19 outcomes among PWH.
- Later studies showed an increased risk for severe COVID-19 disease progression even in the setting of well-controlled HIV.
  - (Unclear whether this was due to the increased prevalence of comorbidities in PWH or other social determinants of health.)

2021 Overall Conclusion: Findings related to COVID-19 and HIV coinfections were conflicted... Highlighted a need for further investigation.

2021 Review Table & Sources

Barbera LK, Kamis KF, Rowan SE, et al. HIV and COVID-19: review of clinical course and outcomes. *HIV Res Clin Pract*. 2021;22(4):102-118. doi:10.1080/25787489.2021.1975608

2024 Updates

- Results remain mixed; however, a few large-scale studies showed that there is not a correlation between HIV status and COVID-19 outcome severity.
- Studies show that with immunodeficiency who are fully vaccinated are more likely to have COVID-19 breakthrough infections.
- Comorbidities and SDoH continue to show the highest impact on COVID-19 outcomes.

2024 Sources

Braunstein SL, Wahnich A, Lazar R. COVID-19 Outcomes Among People With HIV and COVID-19 in New York City. *J Infect Dis*. 2023;228(11):1571-1582. doi:10.1093/infdis/jiad311

Brown LB, Spinelli MA, Gandhi M. The interplay between HIV and COVID-19: summary of the data and responses to date. *Curr Opin HIV AIDS*. 2021;16(1):63-73. doi:10.1097/COH.0000000000000659

Freer J, Mudaly V. HIV and covid-19 in South Africa. *BMJ*. 2022;376:e069807. Published 2022 Jan 27. doi:10.1136/bmj-2021-069807

Sun J, Zheng Q, Madhira V, et al. Association Between Immune Dysfunction and COVID-19 Breakthrough Infection After SARS-CoV-2 Vaccination in the US. *JAMA Intern Med*. 2022;182(2):153-162. doi:10.1001/jamainternmed.2021.7024