

An Overview: SARS-CoV-2 Infection in HIV-positive Adults

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Description

COVID-19 has been linked to about 25 million fatalities and more than 110 million cases worldwide. Although it appeared at first that HIV infection was not a risk factor for COVID-19 or more severe disease, recent large studies suggest that HIV-positive persons (especially those with low CD4 cell counts or untreated HIV infection) may have a more severe clinical course than HIV-negative people. Furthermore, the COVID-19 pandemic has interrupted HIV prevention and treatment programmes around the world, posing significant obstacles to maintaining crucial services. We looked at the most important aspects of COVID-19 in HIV-positive persons and identified areas where more research is needed. More than 38 million individuals worldwide are infected with HIV, with over 25 million of them living in Sub-Saharan Africa. Although it is estimated that 26 million individuals living with HIV are on antiretroviral medication (ART), the majority of those who are not on ART and those who are immunosuppressed live in Sub-Saharan Africa. There has not yet been a clear geographic overlap between the COVID-19 and HIV pandemics, which is fortunate because evidence suggests that people living with HIV who become infected with SARS-CoV-2 have poor clinical outcomes, especially if they are immunosuppressed or not on antiretroviral therapy (ART).

COVID-19's direct clinical effects, on the other hand, should be addressed not just at the person level, but also at the population level. Disruptions to HIV prevention and treatment services are expected to have resulted in a 400000-person increase in HIV/AIDS mortality by 2020. Persons living with HIV account for roughly 10% (95 percent CI 0–30) of total hospitalised COVID-19 cases, 8–10, but SARS-CoV-2 infection prevalence in people living with HIV is between 068–18%, which is similar to the SARS-CoV-2 infection prevalence (06%–08%) observed in the general community. 665 percent of patients living with HIV who had symptoms as a result of SARS-CoV-2 had mild symptoms, 217 percent had severe symptoms, and 118% required critical care. Asymptomatic infection rates in HIV-positive patients, on the other hand, are very certainly overestimated.

SARS-CoV-2 vaccination may alter the epidemiology of COVID-19 in individuals living with HIV and the overlap between the two pandemics in the future, depending on vaccine coverage, vaccination priority for people living with HIV, and the responses of this population to the range of available vaccinations. Despite a growing amount of information on COVID-19 in the general population, the relationship between SARS-CoV-2 and HIV infection is still unclear, and data is sometimes contradictory. Appropriate class-I interferon responses, prompt generation of neutralising antibodies, and specific cell-mediated immunity have all been linked to a favourable COVID-19 clinical course. Low or delayed immune responses, on the other hand, allow viral propagation and are linked to hyperinflammatory states, or cytokine storms, which can result in severe pneumonia, respiratory failure, and death. However, much remains unknown about SARS-CoV-2 immunity, and data

suggest that chronic interferon responses, in combination with IL-1 and tumour necrosis factor production in lung monocytes, may aggravate the cytokine storm in patients with severe COVID-19 infection. As a result, the impact of immunodeficiency in chronic HIV infection on the proper immunological response to COVID-19 may be cause for alarm or may provide potential protection against severe disease.

Interferon is the initial line of defence against infection, and SARS-CoV-2 is susceptible to it in vitro. SARS-CoV-2 has acquired many methods to suppress the interferon response as a result of this. As a result, poor COVID-19 prognosis has been linked to decreased interferon response, which is more common in older patients, genetic defects in interferon-associated pathways, and the generation of anti-interferon antibodies. In acute HIV infection, interferon responses are triggered, which aid in HIV replication control and transmission/founder virus selection. In severe COVID-19 infection, early production of powerful functional IgG antibodies against the SARS-CoV-2 spike protein is linked to survival. Furthermore, recovered individuals had broad, strong CD4 and CD8 memory cell responses, implying that coordinated antigen-specific B-cell and T-cell responses provide protective immunity against severe COVID-19 infection and mortality. Patients with COVID-19 who have a severe clinical course produce immunological responses that are characterised by substantial lymphopenia (low CD4 and CD8 T-cell counts), elevated cytokines and chemokines, huge natural killer cell and lymphocytic activation, and exhaustion. At the pulmonary level, macrophage activation and endothelial damage cause cellular recruitment, increased inflammation, and activation of the complement and coagulation pathways, resulting in exacerbated viral pneumonia, respiratory failure, systemic harm, and mortality [1-5].

Conclusion

In persons living with HIV, full viral suppression with ART ensures near-complete immunological recovery. As a result, SARS-CoV-2 infection in people with well-controlled HIV infection should be treated similarly to SARS-CoV-2 infection in HIV-negative people. However, in a subgroup of patients treated with ART, chronic viral replication, low CD4 counts, and elevated levels of inflammatory markers have been reported, a condition that could lead to severe COVID-19 disease progression. Furthermore, impaired B-cell function that is not fully recovered by ART could lead to a lower COVID-19 vaccination response.

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Conflict of Interests

None.

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