



Evaluation of the severity of COVID-19 in people living with HIV; a review study

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Abstract

Background: Patients with HIV infection may be at an increased risk for morbidity and mortality from the COVID-19. This study aimed to investigate the severity of COVID-19 disease in people living with HIV (PLHIV).

Methods: We conducted a systematic review of all articles and reports conducted in the Scholar, PubMed, and Magiran databases regarding the effects of COVID-19 on PLHIV from the beginning of 2020 until today.

Results: A total of 1893 articles were found. After deleting unrelated articles according to keywords, a total of 507 articles were selected, after deleting duplicate articles, 400 subjects were selected and finally, after reading the abstracts 59 studies were included in our analysis. Finally, 15 papers were selected depending on the type of review.

Conclusion: The results of the present, prevalence, severity of COVID-19 in PLWH was similar general population and this finding suggests that HIV infection not a risk factor for COVID-19, and generally, PLWH should receive the same treatment approach applied to the general population.

Keywords: COVID 19, SARS-CoV-2 infection, HIV, Review

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Introduction

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was identified as the agent of coronavirus disease 2019 (COVID-19) and has led to a significant burden of morbidity, mortality worldwide infection and also a global public health crisis posing numerous increasing health and economic challenges (1). This disease can progress to hypoxic respiratory failure, sepsis, and multi-organ system failure, which can be life-threatening (2). In addition to the physical problems, COVID-19 pandemic represents an unprecedented public health threat. Accordingly, mitigation strategies such as enforced lockdown and physical distancing combined with anxiety about potential infection and recently dubbed corona phobia, can have a profound impact on mental health (1).

High-risk population for severe forms included people 60 years and older and those of any age with underlying medical conditions (e.g., chronic lung disease, asthma, heart conditions, etc). are considered to be at greater risk for adverse outcomes due to COVID-19 (1). Therefore, it is logical to assume that individuals with other health

problems that impact the immune system such as the human immunodeficiency virus (HIV) would be at higher risk of complications and poor prognosis (3) and, therefore, manifesting a severe form of the disease (4).

COVID-19 is associated with lymphopenia, and thereby, an absolute number of CD4 lymphocytes is expected to decrease in these patients. Hence, infection with COVID-19 can theoretically reduce CD4 count in people living with HIV (PLHIV). A decrease in CD4 count is associated with increased susceptibility to opportunistic infections (5). The risk of further complications due to SARS-CoV-2 infection is even higher for HIV-infected patients with low- CD4 cell count, even when they are not on antiretroviral regimens (ARVs). This has created fear and panic among HIV patients globally, especially those from low-income countries (6).

Antiviral used in the treatment of HIV were initially suggested to have a beneficial impact on COVID-19 infection (1). In addition to the economic resources and manpower for HIV care have been shunted to COVID-19 centers. The lockdown imposed at various times has

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■ Implication for health policy/practice/research/medical education

Severity of COVID-19 in people living with HIV was similar to general population.

inadvertently affected the access to HIV testing and care (5).

Objectives

The purpose of this review is to evaluation of the severity of COVID-19 disease in PLHIV.

Methods

Protocol and registration

This is a review on the highest interest scientific topic of the day, related to pandemic COVID-19. We have searched major electronic databases (PubMed, Google Scholar and Medline) to identify available evidence providing information on severity of COVID-19 disease in PLHIV. Keywords used include HIV, AIDS, COVID-19, SARS-CoV-2, and coronavirus 2.

Study design

Our study was performed from a review and Analysis of published reports examining the on severity of COVID-19 disease in PLHIV included clinical trials, prospective and retrospective cohort studies, case-control studies; cross-sectional studies, case series, and case reports.

Intervention

We included clinical studies involving assessment of the severity of COVID-19 disease in PLHIV between to 23 December 2020 and 14 Jan 2022 using “HIV and COVID-19” as search term without restrictions on the study type of setting. The extracted information included mortality, clinical benefits, and adverse events. Outcomes were extracted in all data forms (eg, dichotomous and continuous) as reported in the included studies. The results of our databases search were documented and described in [Figure 1](#) and [Table 1](#).

Discussion

According to the World Health Organization, by the end of 2018, there were approximately 37.9 million PLWHs, with an estimated prevalence of 0.6 to 0.9 percent of 15- to 49-year-olds worldwide with HIV (22). COVID-19 is a potentially fatal respiratory illness caused by SARS-CoV-2) (23).

Generally, PLHIV are perceived to be at high risk of contracting SARS-CoV-2, even though currently (24), and no specific information about the risk of COVID-19 in people with HIV is available. However, the prevalence and prognosis, as well as other clinical characteristics of COVID-19 co-infected PLWH, have not been studied extensively, as an analysis, some studies reported, most

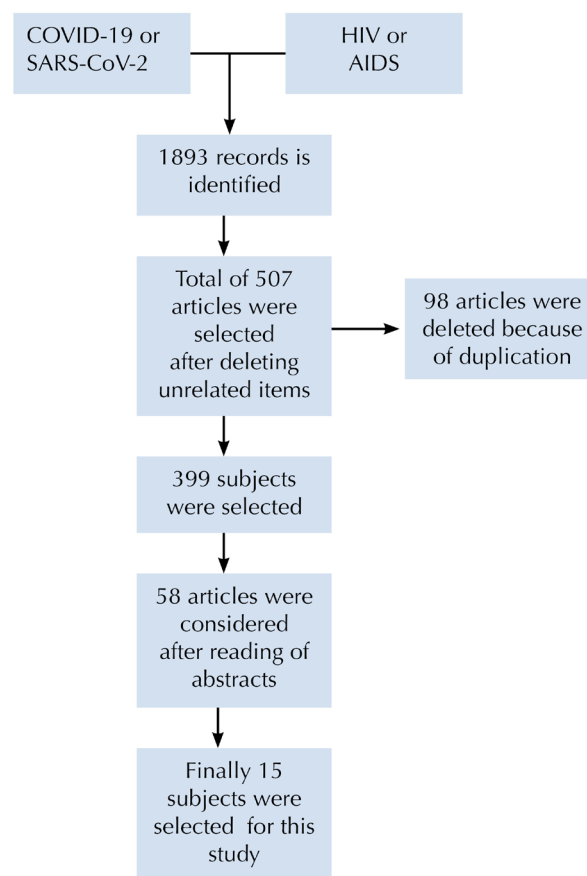


Figure 1. Summary of search strategy and paper exclusion.

symptoms of COVID-19, such as cough, fever, malaise, hospitalized intensive care unit (ICU) admission and breathlessness, in PLWH were similar to the normal population and HIV is not a negative prognostic indicator in COVID-19 infections so (8,10,11,13,15-17). Although, in the some if studies mentioned persons living with diagnosed HIV experienced poorer COVID-related outcomes relative to persons living without diagnosed HIV (20), this may be due to the use of antiviral drugs that can affect the SARS-CoV-2.

Maggiolo and et al, concluded that HIV-infected individuals are not protected from SARS-CoV-2 infection or have a lower risk of severe disease and generally they should receive the same treatment approach applied to the general population (17).

According to some of studies, the presence of comorbidity in particular heart disease, diabetes mellitus, hepatic disease, hypertension, and lung disease affects the severity of COVID-19 complications in PLWH (25).

In addition to the COVID-19 pandemic represents an unprecedented public health threat, and mitigation strategies such as enforced lockdown and physical distancing combined with anxiety about potential infection, recently dubbed ‘corona phobia,’ can have a profound impact on mental health (1).

Table 1. The study characteristics and the data extracted

| Author Name | Location | Population | Number of people surveyed | Type of study | Result |
|---------------------|--|---|---|--|--|
| DM Willner (7) | New York City | Patients were identified with HIV and COVID-19 from March 15th –June 18th 2020. | 39 | Retrospective | Final outcome of the patients, with 77% of the patients discharged, and a mortality rate of 18%. Of note, the only age had a significant correlation with mortality. |
| Ming J Lee (8) | China | 17 PLWH and 50 matched HIV-negative | 67 | Retrospective study | PLWH had fewer deaths, and have not worse outcomes than HIV-negative patients even after adjustment for confounding variables - HIV is not a negative prognostic indicator in COVID-19 infections. |
| AM Geretti (9) | Hospitals in England, Scotland | People with COVID-19 | 53993 | Prospective Observational | HIV-positive status was associated with an increased risk of day-28 mortality among patients hospitalized for COVID-19. |
| J Huang (10) | Wuhan city, China | COVID-19 cases in PLHIV | 35 | Cohort | With the cumulative incidence of COVID-19 to be 0.58% (95%CI: 0.42%-0.81%). Among the COVID-19 cases, 15 (42.86%) had severe illness, with 2 deaths. |
| ME Ceballos (11) | Santiago | PLHIV hospitalized with COVID-19 | 36 | Prospective, multicentric, observational study | The findings of this study do not support that PLWH have a higher risk for aggravation or death from COVID-19 than the general population. We are still learning and understanding about the interactions between HIV and SARS-CoV-2. Further studies should clarify the effect of HIV on the overall risk of COVID-19. |
| Del Amo J (12) | Spain | HIV-positive persons receiving ART | 236 | Cohort Study | 15 were admitted to the ICU, and 20 died. The risks for COVID-19 diagnosis and hospitalization were greater in men and persons older than 70 years. HIV-positive patients receiving TDF/FTC have a lower risk for COVID-19 and related hospitalization than those receiving other therapies. No patient receiving TDF/FTC was admitted to the ICU or died. |
| D'Souza G (13) | US | Participants, including PLWH and HIV-seronegative (SN) | 3411 | Cohort | Prevalence and type of COVID-19 symptoms were similar in PLWH and seronegative. SARS-CoV-2 infection may be elevated among PLWH. |
| Karmen-Tuohy S (14) | | HIV-Positive Patients Hospitalized With COVID-19 | 21 HIV-positive patients with 42 non-HIV patients | Retrospective matched cohort study | Mortality, hospitalization and other inflammatory markers were not statistically significant. Outcomes in our cohort are similar in all patients with COVID-19. HIV-positive patients had significantly higher admission and peak C-reactive protein values. |
| Nagarakanti SR (15) | Newark Beth Israel Medical Center (47) | COVID-19 in people with HIV | 23 | Retrospective cohort | In our cohort of HIV-infected patients, mortality, ICU admission, and the need for mechanical ventilation was similar all patients with COVID-19. |

Table 1. Continued

| Author Name | Location | Population | Number of people surveyed | Type of study | Result |
|-------------------|----------------|---|---------------------------|---------------------------------|--|
| Stoeckle K(16) | New York City | COVID-19 in Hospitalized Adults With HIV | 30 | Retrospective cohort | The clinical manifestations and outcomes of COVID-19 among patients with SARS-CoV-2 and HIV co-infection was similar patients without HIV co-infection. However, PLWH were hospitalized with less severe hypoxemia, a finding that warrants further investigation. Differences in the need for invasive mechanical ventilation during hospitalization, length of stay, or in-hospital mortality. |
| Maggiolo F(17) | Italy | HIV)-infected individuals PLHIV with confirmed SARS-CoV-2 infection | 55 | Prospective cohort | Age distribution, gender, time with HIV infection, among patients with SARS-CoV-2 and HIV co-infection was similar patients without HIV co-infection. The clinical symptoms were similar to normal people. HIV-infected individuals are not protected from SARS-CoV-2 infection or have a lower risk of severe disease. |
| Geretti AM (18) | United Kingdom | COVID-19 in people with HIV | 122 | Prospective observational study | HIV-positive people were younger, and had fewer comorbidities, more systemic symptoms and higher lymphocyte counts and C-reactive protein levels. The cumulative day-28 mortality was similar in the HIV-positive and HIV-negative groups, but in those under 60 years of age HIV-positive status was associated with increased mortality, Mortality was higher among people with HIV after adjusting for age. |
| Yang R (19) | Wuhan, China | COVID-19 in people with HIV | 3 | retrospective study | the patients with SARS-CoV-2 and HIV coinfection had higher maximum body temperatures. Longer duration of fever, longer time to have improvement of chest CT images (22 vs 15 days from the onset of illness, lower level of SARS-CoV-2 IgG. However, no statistically significant difference of duration of SARS-CoV-2 shedding in the two groups was found. |
| Tesoriero JM (20) | New York | HIV-infected patients with COVID-19 | 2988 | cohort | Persons living with diagnosed HIV experienced poorer COVID-related outcomes relative to persons living without diagnosed HIV. |
| Nasreddine R (21) | Belgium | HIV-infected patients with COVID-19 | 101 | Retrospective cohort | Median age was 51.3 years and 44% were female. Overall, 46% of patients required hospitalization and the median length of hospital stay was 6 days. |

Conclusion

The results of the present, prevalence, severity of COVID-19 in PLWH was similar general population and this suggests that HIV infection not a risk factor for COVID-19, and generally, PLWH should receive the same treatment approach applied to the general population. Of course, this pointed should be noted, must people infected with HIV were treated with antiviral prophylaxis, which it may prevent CD4 decrease and thus suppress of the immune system.

Conflicts of interest

The authors declare that they have no competing interests.

Ethical issues

Ethical issues (including plagiarism, data fabrication, double publication) have been completely observed by the authors.

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