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LETTER TO THE EDITOR

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COVID-19 in a patient with HIV infection

To the Editor,

SARS-CoV-2, the etiological agent responsible for the novel coronavirus disease 2019 (COVID-19) has led to curiosities that have driven the path of drug discovery and research for optimal clinical management, especially in patients with other underlying comorbidities.[1] Patients of older age (>60 years) and with other comorbidities such as hypertension, respiratory disease, cardiovascular disease, diabetes, and chronic kidney disease are found to present with more severe infection and have adverse outcomes.[2] However, little is known about COVID-19 in patients with human immunodeficiency virus (HIV) infection, despite the overwhelming majority of patients within this group matching the risk-factors for poor prognosis when infected with SARS-CoV-2. Only a handful of cases of HIV/SARS-CoV-2 coinfection have been reported, none originating in the United States, which has the highest number of reported COVID-19 cases in the world.[3-7] Current therapies for COVID-19 involve a range of antiretroviral therapies, some of which are commonly used as a standard treatment in HIV patients and others that were also proven as an effective course of treatment during the SARS-CoV epidemic.[8] Though there is not enough currently available evidence to argue that PLWH that are receiving standard antiretroviral treatment may be at a lower risk of contracting COVID-19, previous case reports indicate favorable prognosis for these coinfected patients that were already receiving ART. Here, we report a recovered case of SARS-CoV-2 infection in an HIV-positive 58-year-old male, who has been followed by our infectious disease clinic for antiretroviral therapy.

1 | CASE REPORT

A 58-year-old male with a medical history of chronic bronchitis, hypertension, and HIV presented to the emergency department complaining of unresolved symptoms of weakness, anorexia, and diarrhea for 2-weeks. He was under the antiretroviral regimen for HIV which consisted of emtricitabine (200 mg) and tenofovir (25 mg) every 24 hours, atazanavir (300 mg) every 24 hours, and ritonavir (100 mg) every 24 hours. He denied shortness of breath, fever, cough, chest pain, or abdominal pain. He had no recent travel history. Vital signs taken on admission revealed a blood pressure of 145/68 mm Hg, the pulse of 94 beats per minute, the body temperature of 37°C, and oxygen saturation of 99% in ambient air. Within 12 hours of admission, the patient's temperature went up to 39.3°C. Complete blood count (CBC) taken at admission revealed a white blood cell differential count of 5.8×10^9/L, 68% neutrophils and 23% lymphocytes, hemoglobin of 16.1 g/dL, hematocrit of 49%, platelets count of $130 \times 1000/mm^3$. CD4 count was 497 cells/mm^3 and CD4% of 43%, CD8 count was 307 cells/mm^3 and CD8% of 27%. Blood cultures were negative for 5 days, influenza A/B antigen panel was negative, legionella and pneumococcal antigens were negative, stool test was negative for C-difficle toxin, hepatitis A/B/C serology was also negative.

A chest X-ray done on admission showed clear lungs and no significant abnormalities. Reverse-transcription polymerase chain reaction (RT-PCR) result was positive for SARS-CoV-2 infection. The patient was given oral hydroxychloroquine (400 mg, q12h) for 24 hours and then (200 mg, q12h) for 4 more days, oral azithromycin (500 mg, q24h) for 7 days, and zinc sulfate (220 mg, q8h) for 5 days. During the period of hospitalization, the patient also received his normal regimen of antiretroviral therapy at the previous dose. His fever spike lasted up to 94 hours and maximum body temperature during this time was 39.4°C (Table 1). After 4 days of hospitalization, he became afebrile and had complete resolution of symptoms. Repeat CBC showed white blood cell differential count of 7.2×10^9/L, 69% neutrophils, 21% lymphocytes, hemoglobin of 14 g/dL, hematocrit of 44%, and $190 \times 1000/mm^3$ platelets. He was discharged on the fifth day of hospitalization after the clinical picture showed marked improvement and was advised to self-isolate at home for a minimum of 14 days.

2 | DISCUSSION

Our case corroborates the current trend of HIV/SARS-CoV-2 coinfected patients having a more favorable prognosis and less severe clinical presentation of COVID-19 when already under treatment with antiretroviral therapy. Unlike previously reported cases of coinfection, our patient also had other comorbidities including chronic bronchitis and hypertension. Altuntas Aydin et al[4] suggest the presence of other comorbidities in COVID-19 patients

TABLE 1 Vital signs for the hospitalization period of 5 days

Day of admission	1	2	3	4	5
Systolic blood pressure (mm Hg)	130	118	132	136	115
Diastolic blood pressure (mm Hg)	72	68	77	72	79
Pulse (beats/min)	94	84	67	80	96
Respiratory rate (breaths/min)	18	16	19	16	30
Temperature (°C)	37	39.1	39	39.1	37.4
Oxygen saturation on room air (%)	94	94	96	96	96

with HIV as a factor of increased mortality, however, our patient still recovered without severe symptoms. He was not admitted to the intensive care unit nor did he require mechanical ventilation, and symptoms resolved after a few days of treatment with hydroxychloroquine, azithromycin, and his normal antiretroviral regimen (Table 1). Mascolo et al[9] has suggested the possibility of immunosuppressed patients being protected against severe clinical manifestations despite their susceptibility to SARS-CoV-2 infection. More studies are needed to further investigate the impact of comorbidities in these patients. Currently, there is no evidence suggesting that there is a higher rate of SARS-CoV-2 infection in HIV patients compared to non-HIV patients. Previous case reports have shown delayed antibody responses against SARS-CoV-2 in HIV patients, abnormal computed tomography (CT) findings which differ from the typical radiographic features seen in COVID-19 patients, and early virus clearance in coinfected patients.[5,10]

With the exception of the patient in this report, we have not seen any other HIV-positive patients develop COVID-19 in our large HIV outpatient clinic. The paucity of case reports of HIV and SARS-CoV-2 coinfection may suggest that PLWH that are receiving ART are not at significant risk for COVID-19 and could have a protective mechanism yielding better prognosis and faster resolution of symptoms.[4] Anti-HIV agents have also been shown to have therapeutic effects against SARS-CoV-2. Experience from prior coronavirus outbreaks including SARS-CoV and MERS also had limited case reports of HIV coinfected patients.[11] In conclusion, we report the first known case of COVID-19 in an HIV-positive patient within the United States. Despite having underlying comorbidities, our patient had a favorable outcome and presented with less severe symptoms of COVID-19. Further studies are urgently needed to better understand and evaluate the mechanisms of antiretroviral therapy on HIV patients with COVID-19.

CONFLICT OF INTERESTS

The authors declare that there are no conflicts of interests regarding the publication of this paper. None of the authors are affiliated with, or have a financial involvement in any organization or entity with direct financial involvement in the subject matter or materials of the research discussed in this manuscript. There is no material that is under the copyright of another party or appearing in another unpublished manuscript. The final manuscript has been seen and approved by all authors.

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