



## COVID 19 IN PEOPLE WITH HIV – A RETROSPECTIVE CASE SERIES

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**ABSTRACT** *Objective:* To study the characteristics of patients with HIV and COVID-19 co-infection. *Methods:* Retrospective collection of data of people with HIV admitted with COVID-19, from medical record section of the hospital. We studied the clinical features, biochemical markers, radiological reports and treatment records of 5 patients admitted in our tertiary care hospital with a positive RT PCR test for COVID 19. We noted in particular the details of duration of HIV diagnosis, latest available CD4 counts, Antiretroviral therapy and adherence to treatment. *Results:* All patients were diagnosed with HIV for more than five years and were varyingly adherent to the Antiretroviral therapy. Patient with lowest CD4 count (67) had full recovery whereas patient with CD4 of 160 succumbed. Commonest associated comorbidity was Diabetes Mellitus. Patient 1 had mild COVID illness. Patient 2 succumbed to severe COVID whereas moderate to severe COVID was seen in patients 3 to 5. Elevation of inflammatory markers like ferritin, D dimer, IL-6 were seen in patients with moderate to severe illness. Four patients were discharged without any complications. *Conclusion:* Poorly controlled HIV did not translate to poor outcome in our retrospective case series. Larger studies of Indian population with HIV and COVID-19 coinfection are needed to understand the relationship of viral load, inflammatory markers and comorbidities with the disease outcome.

**KEYWORDS :** COVID-19; HIV; antiretroviral therapy; Comorbidity; mortality.

**SIGNIFICANCE:**

HIV patients are expected to have a higher-than-average risk of infection. Multiple studies and meta-analysis in the world have suggested contrasting results regarding the relationship of HIV with severity of COVID, thus continuing to baffle the clinicians. Data on morbidity and mortality of these patients in COVID is not largely known in Indian population. Our case series aims to be a pilot study in Western India to assess the characteristics and outcomes of patients with HIV admitted for COVID. Larger cohort studies are required in India to understand the true impact HIV in COVID patients.

**INTRODUCTION**

In December 2019, a novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), emerged in the city of Wuhan, China, causing a catastrophic pandemic. Limited evidence is available on the impact of HIV on SARS-CoV-2 infection and outcomes. The presence of COVID-19 in a patient with a pre-existing infection like HIV presents a challenging situation for the treating physician. The Centre for Disease Control and Prevention identifies older adults and those with certain underlying medical conditions as being at elevated risk for severe illness from COVID-19.<sup>[1]</sup> There may be an increasing trend of ICU admissions and mechanical ventilation in HIV patients with COVID.<sup>[2]</sup> This case series aims to understand the presentation, complications and outcome of the patients admitted in our hospital for COVID-19.

**CASE HISTORY**

The patient records were collected retrospectively. Waiver of consent and Approval was obtained from Institutional Ethics Committee. All patients were males, with mean age of 54 years. Patient 1 had Hypertension and Ischemic heart disease, patient 2 and 4 had Diabetes Mellitus. Mean duration of HIV illness was 9.6 years. Presenting complaints were fever, cough and dyspnoea (Table 1). Four patients had ARDS (acute respiratory distress syndrome) with pO<sub>2</sub> FiO<sub>2</sub> ratio (PFR) <200 on presentation.

The patients were diagnosed by RT PCR for SARS-CoV-2. Lung involvement was diagnosed by High- Resolution Computed Tomography (HRCT) Thorax. CT severity score was between 11-18 out of 25 in patient 3, 4 and 5. CT severity score of patient 1 was 3/25, and CT report was not available for patient 2.

Patient 1 was given supportive treatment in the form of vitamin C, Zinc, ivermectin and doxycycline along with antiretroviral therapy

[ART] (Zidovudine, Lamivudine, Nevirapine). His latest CD4 was 666. He did not require supplemental oxygen therapy. Patient 2 received injectable methylprednisolone, heparin, ceftriaxone and remdesivir along with supportive care. He was on ART constituting TLE (Tenofovir, Lamivudine, Efavirenz). He required supplemental oxygen therapy for 5 days and invasive ventilation for 3 days. Patient 3 and 4 were taking ZLN (Zidovudine, Lamivudine, Nevirapine) and TLE (Tenofovir, Lamivudine, efavirenz) respectively, as ART. They were treated with injection methylprednisolone for 14 days in tapering doses, heparin and azithromycin for 7 days, Remdesivir for 5 days. Patient 5 had discontinued ART for the past one year. He was treated with Remdesivir for 5 days, heparin and ceftriaxone for 7 days and dexamethasone for 10 days in tapering doses along with supportive care. Mean duration of hospitalization was 17.2 days.

**Table 1**

Serial number	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5
Cd4 count	666	160	Not available	67	297
Hb	12.4	11.6	11.7	13.5	13.5
TLC	5600	6700	12650	5300	12290
Neutrophil lymphocyte ratio (NLR)	3.4	3.7	3	17.5	8.4
Platelets	179000	256000	225000	171000	433000
SGOT/SGPT	73/40	42/40	122/345	35/39	64/61
Ferritin (normal value 22-322ng/ml)	30	418	4187	827.7	613
D dimer (normal value <500ng/ml)	200	1250	3480	462	692
IL 6 (normal value <7 pg/ml)	6	5500	3769	6.45	57.6

**DISCUSSION:**

This case series describes our experience with 5 patients living with HIV who were admitted for COVID infection (Table 1). After studying the clinical characteristics, we observed that patient 1 had mild illness despite comorbidities like hypertension and ischemic heart disease. However, he had normal chest radiography, CD4 count was 666 and normal levels of inflammatory markers. We encountered 1 death (Patient 2). He was a 43-year-old male who had DM with poor glycemic control, CD4 count of 166 and had elevated levels of IL6 and

D dimer and a high NLR (3.7). Dysregulation of immune response in the form of elevated NLR and IL 6 were found in patients with severe COVID as compared to mild disease, in a Chinese study.<sup>[3]</sup> A meta-analysis similarly shows that elevated levels of CRP, D dimer and Ferritin are associated with poor outcome in COVID 19<sup>[4]</sup>.

Raised inflammatory markers and elevated CT severity scores (>8/25) were also observed in the rest of the 3 patients with moderate to severe illness. Patient 3 had transaminitis. Patient 4 had a history of deep venous thrombosis and was on anticoagulation. Patient 5 had stopped antiretroviral medications for 7 years and his last available CD4 from 4 years back was 297. He had DM. Markers of inflammation (ferritin, IL6) were raised in all and D dimer was elevated in patients 3 and 5. All had prolonged hospital stay >10 days but they recovered well.

Various studies that evaluated the impact of HIV on COVID severity and disease outcome have had diverse results. A systematic review from UK showed that patients with well controlled HIV infection did not have poor COVID outcomes, but superimposed bacterial pneumonia poses a risk for severe COVID illness.<sup>[5]</sup> A study by Karmen-Tuohy et al showed no statistical difference in outcomes, presentation or hospitalization course of COVID-19 between people with HIV and the general population.<sup>[2]</sup> It failed to show significant association of HIV infection with intensive care unit admissions and mechanical ventilation.

A retrospective cohort study of 86 patients from Western India shows similar outcomes in HIV as seen in the general population. However, severe COVID was found to be associated with presence of medical comorbidities rather than HIV-related disease characteristics.<sup>[6]</sup>

Contrasting evidence has been seen in some other studies. A Cohort study by Tesoriero et al observed poor COVID related outcomes, higher rate of hospitalization and severe disease in people with HIV as compared to patients without HIV.<sup>[7]</sup> Higher rate of mortality among HIV-COVID-19 coinfecting individuals as compared with those without HIV infection have been reported in several large population-based studies across the world.<sup>[8,9,10]</sup> A population-based cohort analysis in UK noticed increased risk of death in HIV patients despite ART coverage and viral suppression.<sup>[9]</sup> A Study from South Africa has shown that mortality risk in patients with HIV is doubled as compared to non-HIV population.<sup>[8]</sup> A prospective observational study noted Increased 28-day mortality in HIV positive individuals, irrespective of the gender, and especially in <60 years of age.<sup>[10]</sup>

There are a few limitations to our case series. Only 5 symptomatic patients admitted in our ward were included in the series; missing mild or asymptomatic, overestimating the severity. Concrete conclusions cannot be drawn from this case series.

## CONCLUSION

For in depth understanding of the relationship of HIV (viral load and CD4 counts) and COVID co infection, impact of other comorbidities and inflammatory markers; studies with larger sample size are required in the Indian population.

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