

Characteristics of HIV SARS-COV-2 Coinfection in a Highly HIV Seropositive Population in New York City

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BACKGROUND

- The HIV and SARS-CoV-2 coinfection prevalence has not been described extensively, and the correlation between HIV and SARS-CoV-2 disease severity is still unknown
- The relationship between the hyperinflammatory response syndrome, known as the “cytokine storm”, and worsened clinical outcomes in SARS-CoV-2 raises a controversial question: **are HIV-infected patients at a greater risk of disease severity compared to non-HIV-infected individuals?**
- Generally, HIV-induced immunosuppression increases the risk of acquiring infections; however, a dormant immune system may not be able to mount an aggressive inflammatory response, which may translate to a less severe clinical presentation in HIV-infected SARS CoV-2 patients
- Given the high prevalence of HIV in our patient population, and our Designated AIDS Center (DAC) with approximately 600 patients, this relationship is of great clinical interest
- A multicentered study of 286 HIV SARS-CoV-2 coinfecting patients showed comparable outcomes to non-HIV patients, but did show significantly worse outcomes in patients with low CD4 counts [1]
- A retrospective review of 88 HIV SARS-CoV-2 admitted patients in a 5-hospital health system in NYC also found similar outcomes among this cohort with matched non-HIV COVID-19 patients [2]

OBJECTIVES

- Describe the characteristics of patients with HIV and SARS CoV-2 admitted to our institution from March 15th-June 18th, 2020
- Evaluate the outcomes and assess for any associations between disease severity and HIV status

METHODS

- We conducted a retrospective chart review of all patients admitted with confirmed HIV and SARS-CoV-2. We reviewed demographics, past medical history, HIV history, including antiretroviral therapy, adherence, viral loads, CD4 counts, along with SARS-CoV-2 clinical and laboratory markers
- Baseline clinical status evaluation was performed utilizing the World Health Organization’s Ordinal Scale to determine clinical improvement and disease outcomes [3]. Mortality and disease severity as compared to the general COVID-19 patient population was analyzed

RESULTS (N=39)

Baseline Characteristics	
Age (years, median)	57
African American/Black (%)	67%
Hispanic/Latino (%)	44%
Past Medical History	
Hypertension (%)	69%
Diabetes (%)	51%
BMI (median, kg/m ²)	28.3
Viral Load (number of patients, %)	
≥ 20 copies/mL	8 (40%)
< 20 copies/mL (undetectable)	12 (60%)
CD4+ Count (number of patients, %)	
≥ 200/ μL	27 (87%)
< 200/ μL	4 (13%)
HIV Medication Compliance (number of patients, %)	
Yes	30 (77%)
No	3 (8%)
Unknown	6 (15%)
Admission Vitals (median)	
Temperature (°F)	98.9
Oxygen Saturation	94%
Hematology (median)	
White Blood Cell (10 ³ /μL)	6.3
Neutrophils	72%
Lymphocytes	17.5%
Inflammatory Markers (median)	
IL-6 Level (pg/mL)	159
C- Reactive Protein (mg/dL)	9.8
Admission Ordinal Scale Score (%)	
3 (no respiratory dysfunction)	15 (38%)
4 (nasal cannula or nonrebreather)	16 (41%)
6 (mechanically ventilated)	8 (21%)

Figure 1: Baseline Characteristics in HIV SARS-CoV-2 Coinfected Patients

Disease Outcome (number of patients, %)	
Discharged	30 (77%)
Deceased	7 (18%)
Still Hospitalized	2 (5%)
Length of Stay (median)	7 Days

Figure 2: Outcomes of HIV SARS-CoV-2 Coinfected Patients

Outcome	HIV SARS-CoV-2 Group (N=39)	Overall Population (N=177)	P-Value
Intubation	8(21%)	56(31.6%)	0.18
Mortality	7(18%)	58(33%)	0.08

Figure 3: Comparison of Outcomes in HIV SARS-CoV-2 Coinfected Patients to Overall SARS-CoV-2 Patient Population Admitted from March 15th-31st, 2020

- 39 patients were identified with concomitant HIV and SARS-CoV-2 from March 15th –June 18th 2020. Baseline characteristics are listed in Figure 1. Of the available labs, 60% of patients were virally suppressed, and 87% had CD4+ counts above 200/μL. On admission, most patients either did not required supplemental oxygen or received it through noninvasive methods
- In Figure 2 we see the final outcomes, with 77% of the patients being discharged. Of note, the only baseline characteristic that had a significant correlation with mortality among our described patients was age > 60 (**p = 0.03**). Mortality in our HIV SARS-CoV-2 population was 18%, lower than the 33% in SARS-CoV-2 patients overall at our institution in the month of March, although this result did not meet statistical significance, as depicted in Figure 3
- ART adherence, viral suppression, and CD4+ counts did not correlate with outcomes; larger studies are needed to fully evaluate the protective effects of antiviral therapy and/or decreased immune response in HIV patients coinfecting with SARS-CoV-2

DISCUSSION

- Our results align with previously published retrospective analysis that have described how HIV-infected patients do not appear to be at higher risk than the average population, and disease severity correlates with age and co-morbidities such as obesity, diabetes, and hypertension, and not HIV or associated immunosuppression [1,2,4]
- Our study is not without limitations; it was a retrospective analysis, and it was a single-centered study. The clinical outcomes described in our analysis might be confounded by multiple factors, such as the lack of clinical trials and proven therapeutic agents; additionally, patient care during this time period may have been suboptimal due to an unprecedented emergency that overwhelmed and stretched the healthcare system throughout New York City

CONCLUSIONS

- It is unknown whether a correlation between an HIV-related immunosuppressed and disease severity exists; large retrospective analysis have found similar rates of SARS-CoV-2 and severe disease in HIV and non-HIV patients, which our study confirmed. Our findings identified a relationship between age and disease outcomes in this population. This subject has not been well studied, and large controlled group studies are needed to better assess this important and vulnerable patient population

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