SARS-CoV-2 infection and outcomes among persons living with HIV (PLWH) in the mid-Atlantic US

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BACKGROUND

- Reports of COVID-19 severity and outcomes in persons living with HIV (PLWH) vary across cohorts.
- There is limited data regarding COVID-19 associated complications (i.e., acute kidney injury, thrombotic, or cardiovascular events).

STUDY AIMS

- To describe the clinical characteristics and outcomes of PLWH with COVID-19 as compared to a matched cohort.
- To determine rates of COVID-19 associated complications (acute kidney injury, other infections, thrombotic, and cardiovascular events) among PLWH.

METHODS

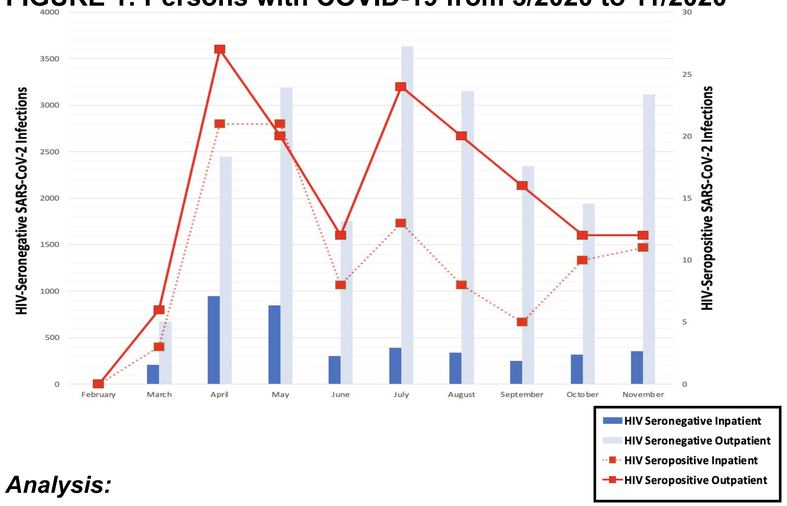
Cohort Population and Data Source:

- Adult PLWH with COVID-19 who received care in the MedStar Health care system between 03/2020 to 11/2020 frequency age/sex matched (1:4) to an HIV seronegative population with COVID-19.
- MedStar Health is a large healthcare system in the mid-Atlantic US that includes 10 hospitals in addition to ambulatory care centers.

Data and Variables

- Demographic/clinical data extracted from the electronic health record
- Diagnoses determined by ICD-10 coding with accuracy verified by selected manual adjudication
- Multimorbidity = 2+ comorbidities including cardiovascular disease, obesity, diabetes mellitus, chronic renal disease, malignancy

FIGURE 1: Persons with COVID-19 from 3/2020 to 11/2020



Analysis:

- Descriptive statistics were used to describe cohort data.
- Univariate and multivariate logistic regression were used to explore factors associated with hospitalization and incident death/mechanical ventilation requirement among PLWH

RESULTS

TABLE 1: Clinical Characteristics of PLWH vs HIV-seronegative individuals with COVID-19 (*p<0.05)

Characteristic	HIV-Seronegative (n=1124)	HIV-Seropositive (n=281)
Age mean, years (SD)	51.2 (13.7)	51.5 (12.7)
Sex at Birth, n (%)		
Male	708 (63)	177 (63)
Female	416 (37)	104 (37)
Race, n (%)*		
African-American/Black	388 (44)	237 (86)
White	341 (39)	20 (7)
Other	157 (18)	18 (7)
Ethnicity, n(%)*		
Non-Hispanic	813 (92)	258 (98)
Hispanic	69 (8)	6 (2)
Insurance, n (%)*		
Private	818 (75)	161 (58)
Medicaid	79 (7)	67 (24)
Medicare	146 (13)	45 (16)
Non-Insured	46 (4)	6 (2)
Hospitalized, n (%)*	269 (24)	132 (47)
Median Length of Stay, days [IQR]	6 [3, 11]	5.5 [3, 11]
Supplemental Oxygen, n (%)		
Room Air	38 (18)	27 (25)
Nasal Cannula	82 (39)	33 (30)
Non-Rebreather/HFNC	29 (14)	25 (23)
Ventilator	53 (25)	21 (19)
Death, n (%)	146 (13)	39 (14)
HIV Viral Load copies/mL <200, n (%)	---	50 (87)
Median CD4 + T Lymphocytes cells/mm^3 n, [IQR]	---	623 [383, 938]

- Despite higher burdens of comorbid illness, PLWH did not experience more cardiovascular, acute kidney injury, or thrombotic events.
- Older age, the presence of multimorbidity, and Medicaid insurance were associated with more severe outcomes among PLWH in in this cohort.
- Ongoing assessments of these findings are needed among PLWH, especially socially or economically vulnerable populations, those with advanced age, or multiple comorbidities.

TABLE 2: Comorbid Disease among PLWH vs HIV-seronegative individuals with COVID-19 (*p<0.05)

Characteristic	HIV-Seronegative (n=1124)	HIV-Seropositive (n=281)
Chronic Comorbid Conditions, n (%)		
Cardiovascular Disease*	423 (38)	174 (62)
Hypertension*	403 (36)	165 (59)
Obesity*	280 (25)	111 (40)
Diabetes Mellitus*	226 (20)	92 (33)
Chronic Renal Disease*	117 (10)	31 (11)
Chronic Liver Disease*	62 (6)	70 (25)
Malignancy*	19 (2)	28 (10)
Transplant	14 (1)	8 (3)
COVID-19 Associated Events, n (%)		
Thrombotic	2 (1)	1 (0.4)
Infections	14 (1)	7 (2)
Cardiovascular	22 (2)	9 (3)
Acute Kidney Injury	6 (1)	4 (1)

- The majority of PLWH in this cohort had a suppressed viral load
- PLWH had higher rates of COVID-19 hospitalizations than than the HIV-seronegative in this cohort
- Insurance status and race differed between the HIV-seronegative and PLWH
- Rate of death was similar between PLWH and the HIV-seronegative

TABLE 3: Factors associated with hospitalization or death/mechanical ventilation among hospitalized PLWH with COVID-19 (*p<0.05)

Characteristic	Hospitalization aOR	Death/Mechanical Ventilation aOR
Age, years	1.04 (1.01, 1.06)*	1.06 (1.01, 1.11) *
Sex at Birth		
Female (reference)	-----	-----
Male	1.5 (0.87, 2.62)	0.97 (0.42, 2.34)
Insurance		
Private (reference)	-----	-----
Medicaid	2.61 (1.39, 4.97)*	3.6 (1.36, 9.74)*
Medicare	1.41 (0.67, 3.01)	1.33 (0.42, 3.99)
Uninsured/Self-Pay	0.78 (0.09, 5.39)	12.09 (1.17, 1.26E+02)
Multimorbidity	2.98 (1.72, 5.23)*	4.4 (1.55, 15.9)*

Adjusted for all other variables in the model.

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