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Short Communication

SARS-COV2 infection in 30 HIV-infected patients followed-up in a French University Hospital



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ABSTRACT

Introduction: An acute respiratory disease caused by a novel coronavirus (SARSCOV2) is spreading from China since January 2020. Surprisingly, few cases of Covid-19 have been reported in people living with HIV (PLWHIV).

Methods: Here we present a series of 30 PLWHIV diagnosed for SARS-COV2 infection. The principal outcome was to describe clinical characteristics of this population.

Results: Eighteen (60%) patients were men, 10/30 (33,3%) women and 2/30 (6,7%) transgender women. Median age was 53,7 years (range 30–80 years) and 23/30 patients (76,7%) were born in a foreign country (out of France). The most common comorbidities were cardiovascular disease (11/30, 36,7%), hypertension (11/30, 36,7%), diabetes (9/30,30%) obesity (7/30, 23%) and chronic renal disease (5/30, 16,7%). Twenty (66,7%) patients presented overweight. Five patients (16,7%) had a Charlson comorbidity (Quan et al., 2011) score ≥ 3 . Twenty-seven (90%) patients were virologically suppressed. CD4 count was >500 cell/mm³ in 23/30 (76,6%) patients. An antiviral treatment for SARS-COV2 was administered, in addition to HIV treatment, in 5/30 patients (16,3%). Twenty-four patients (80%) recovered from covid-19, 3/30 (10%) required invasive mechanical ventilation, 2/30 (6,7%) patients died and 4/30 (13,3%) patients were still hospitalized.

Conclusions: Most of the patients were virologically suppressed with CD4 >500 mm³. Risk factors were the same as those described in other SARS-COV2 series, suggesting that HIV infection is probably not an independent risk factor for covid-19.

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Short communication

An acute respiratory and potentially fatal disease caused by a novel coronavirus (SARS-COV2) has been spreading from China since January 2020.

Surprisingly, few cases of Covid-19 have been reported in people living with HIV (PLWHIV).

As of April 27th 2020, with a total of 5327 PLWHIV followed-up at Bichat University Hospital in Paris, 30/5327 (0,5%) patients have been diagnosed with Covid-19, of whom 21/30 (70%) were inpatients and 9/30 (30%) were outpatients, assessed in telemedicine clinics set up during the outbreak lock down. Most SARS-COV2

infected outpatients with mild symptoms were probably not diagnosed or not referred to the hospital.

A total of 390 patients have been admitted to the Infectious Diseases department with a diagnosis of SARS-COV2, of whom 21 (5,4%) were PLWHIV.

All participants gave their written consent to have their medical chart recorded in the electronic medical record system Nadis[®], from which we extracted anonymized data.

Clinical characteristics and outcomes of the study population are reported in [Table 1](#).

Eighteen (60%) patients were men, 10/30 (33,3%) were women and 2/30 (6,7%) were transgender women. Median age was 53,7 years (range 30–80 years) and 23/30 patients (76,7%) were born in a foreign country (out of France). The most common comorbidities were cardiovascular disease (11/30, 36,7%), hypertension (11/30, 36,7%), diabetes (9/30,30%) obesity (7/30, 23%) and chronic renal disease (5/30, 16,7%). Twenty (66,7%) patients presented

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Table 1
Clinical characteristics and outcomes of HIV patients diagnosed with covid-19.

	Comorbidities (Charlson score) Quan et al. (2011)	BMI kg. m-2	CD4 cells/ μL	HIV viral load Copies/mL	ART-regimen before admission	SARS-COV2 PCR	Clinical status* D30	Outcomes
Patient 1	Hypertension, dyslipidemia, hypertensive cardiomyopathy, chronic renal failure (1)	36.2	350	<20	abacavir + lamuvidine + raltegravir + darunavir + ritonavir	yes	1	Cured
Patient 2	None (0)	34.9	1010	<20	tenofovir alafenamide + emtricitabine + elvitegravir + cobicistat	yes	1	Cured
Patient 3	None (0)	23.9	720	<20	dolutegravir + rilpivirine	yes	1	Cured
Patient 4	None (0)	24.8	620	<20	tenofovir alafenamide + emtricitabine + elvitegravir + cobicistat	yes	1	Cured
Patient 5	None (0)	29.3	1020	<20	rilpivirine + emtricitabine + tenofovir alafenamide	yes	1	Cured
Patient 6	37 weeks pregnancy, recurrent herpetic infection (0)	26.6	640	<20	abacavir + lamuvidine + nevirapine	yes	1	Cured
Patient 7	Hypertension, diabetes, disseminated Cryptococcus (4)	21.1	40	14,164	bictegravir + emtricitabine + tenofovir alafenamide + darunavir + ritonavir + atazanavir + dolutegravir	yes	1	Cured
Patient 8	Hypertension, diabetes, stroke (1)	22.3	460	<20	tenofovir disoproxil + raltegravir + darunavir + ritonavir	yes	1	Cured
Patient 9	Hypertension, hypertrophic cardiomyopathy, kidney transplantation (1)	26.6	220	<20	bictegravir + emtricitabine + tenofovir alafenamide	yes	1	Cured
Patient 10	Kidney transplantation, stroke, pulmonary embolism (5)	24.6	140	<20	abacavir + lamuvidine + dolutegravir	yes	1	Cured
Patient 11	None (0)	29.5	460	<20	abacavir + lamuvidine + dolutegravir	yes	1	Cured
Patient 12	Hypertension (0)	39.8	910	<20	rilpivirine + emtricitabine + tenofovir alafenamide	yes	1	Cured
Patient 13	None (0)	29.0	900	<20	tenofovir alafenamide + emtricitabine + elvitegravir + cobicistat	yes	1	Cured
Patient 14	Diabetes, hypertension, chronic renal failure, dialysis (2)	40.0	870	<20	abacavir + lamivudine + dolutegravir	yes	7	Death
Patient 15	Pulmonary tuberculosis (0)	23.1	980	<20	tenofovir alafenamide + emtricitabine + elvitegravir + cobicistat	yes	1	Cured
Patient 16	Hypertension, diabetes, atrial fibrillation, ischemic stroke, prostatic adenocarcinoma (1)	32.8	390	<20	tenofovir alafenamide + emtricitabine + elvitegravir + cobicistat	yes	1	Cured
Patient 17	Diabetes with microangiopathic complications, dementia (3)	31.6	620	<20	abacavir + lamuvidine + dolutegravir	yes	1	Cured
Patient 18	None (0)	29.8	910	<20	tenofovir disoproxil + nevirapine	yes	1	Cured
Patient 19	Hypertension, diabetes, ischemic stroke, chronic renal failure, COPD, pulmonary embolism (3)	28.1	570	<20	abacavir + lamuvidine + dolutegravir	yes	7	Death
Patient 20	Dilated cardiomyopathy (1)	29.3	810	<20	rilpivirine + emtricitabine + tenofovir alafenamide	Neg	1	Cured
Patient 21	Severe cervical dysplasia, esophageal ulcer (0)	28.7	1109	<20	tenofovir disoproxil + doravirine + lamuvidine	ND	1	Cured
Patient 22	Diabetes, ischemic stroke (1)	29.7	240	<20	rilpivirine + emtricitabine + tenofovir disoproxil	Neg	3	Hosp
Patient 23	Hypertension (0)	24.6	830	<20	tenofovir alafenamide + emtricitabine + elvitegravir + cobicistat	ND	1	Cured
Patient 24	Bipolar disorder (0)	28.4	770	<20	rilpivirine + emtricitabine + tenofovir disoproxil	ND	1	Cured
Patient 25	None (0)	28.7	1190	39	tenofovir disoproxil + emtricitabine + elvitegravir + cobicistat	yes	1	Cured
Patient 26	Alcoholism, delirium tremens, dilated cardiomyopathy (1)	31.6	200	65	maraviroc + darunavir + ritonavir + dolutegravir	yes	3	Hosp
Patient 27	Depressive disorder (0)	24.1	650	<20	rilpivirine + emtricitabine + tenofovir alafenamide	ND	1	Cured
Patient 28	None (0)	21.0	585	<20	lamivudine + dolutegravir	yes	1	Cured
Patient 29	Hypertension, diabetes, stroke, aphasia, ischemic heart disease (1)	21.2	630	<20	zidovudine etravirine + raltegravir + darunavir + ritonavir	yes	NA	Hosp

Table 1 (Continued)

	Comorbidities (Charlson score) Quan et al. (2011)	BMI kg. m-2	CD4 cells/ μL	HIV viral load Copies/mL	ART-regimen before admission	SARS-COV2 PCR	Clinical status* D30	Outcomes
Patient 30	Hypertension, diabetes, carotid stenosis (1)	28.7	627	<40	tenofovir disoproxil + doravirine + lamivudine	yes	6	Hosp

The 7-point ordinal scale is an assessment of the clinical status (Peterson et al., 2017). The scale is as follows.

1. Not hospitalized, no limitations on activities, 2. Not hospitalized, limitation on activities, 3. Hospitalized, not requiring supplemental oxygen; 4. Hospitalized, requiring supplemental oxygen;
 5. Hospitalized, on non-invasive ventilation or high flow oxygen devices, 6. Hospitalized, on invasive mechanical ventilation or ECMO, 7. Death.
- ND** : not done; **NA** : not applicable; **Hosp** : still hospitalized patients.

overweight. Five patients (167%) had a Charlson comorbidity (Quan et al., 2011) score ≥ 3 .

Twenty-seven (90%) patients were virologically suppressed, 2/30 patients (6,7%) had a low level plasma HIV-RNA viral load (>20 and <70 copies/mL) and only 1/30 patients had a viral load $> 10,000$ copies/mL. CD4 count was >500 cell/mm³ in 23/30 (76,6%) patients.

Positive SARS-COV2 protein chain reaction (PCR) was confirmed in 24/30 (80%) patients, 2/30 (6,7%) patients had negative SARS-COV2 PCR and typical covid-19 chest CT findings, while diagnosis was based on typical clinical presentation (anosmia and/or ageusia) in 3/30 (10%) patients (nasopharyngeal swab not done).

Median delay between symptoms onset and diagnosis was 7 days (range 1–16 days).

Antiretroviral treatment was modified during hospitalization in only one patient (switch from a TDF to a TAF-containing regimen in order to prevent renal failure in a critical patient).

An antiviral treatment for SARS-COV2 was administered, in addition to HIV treatment, in 5/30 patients (163%): 3/30 (10%) patients received lopinavir/ritonavir and 2/30 (6,6%) hydroxychloroquine. Moreover, 5/30 (166%) patients received dexamethasone and 1/30 (3,3%) tocilizumab.

Twenty-four patients (80%) recovered from covid-19, 3/30 (10%) required invasive mechanical ventilation, 2/30 (6,7%) patients died and 4/30 (13,3%) patients are still hospitalized.

Study population reflects the characteristics of the population routinely followed-up at our center, with a high percentage of migrant patients (65, 1% in PLWHIV routinely followed up, 767% in the study population). Main comorbidities were cardiovascular disease, hypertension, diabetes, obesity, and chronic renal disease, all being classic covid-19 risks factors described in others studies (Richardson et al., 2020; Hu et al., 2020; Grasselli et al., 2020; Mehra and Mandeep, 2020; Zheng et al., 2020)

In a recent publication of 57.000 patients hospitalized with SARS-COV2 infection in 12 hospitals in the New York City area, the median score of the Charlson Comorbidity Index was 4. (Richardson et al., 2020)

In our population, only five patients (167%) had a Charlson comorbidity score ≥ 3 , but we also included outpatients and the median age was lower (53 vs 68 years).

In the same study, percentage of patients requiring mechanical ventilation was 12.2%, similar to that observed in our study (10%), but mortality was higher (21% vs 6,7%), in line with a higher comorbidity score.

In our series, the poorest outcomes and death were observed in patients with a high comorbidity score.

Most patients (90%) were virologically suppressed, with a CD4 > 500 (766%), suggesting a role of already described risk factors, rather than immunosuppression, for SARS-COV2 infection.

Compared to other series of PLWHIV SARS-COV2 infected patients (Blanco et al., 2020; Vizcarra et al., 2020), a lower percentage of patients had specific antiviral treatment for Covid-19

(163%). Based on local guidelines, antiviral treatment was indicated only in hospitalized patients with severe disease (oxygen requirement > 3 lpm).

Five patients in our study population were treated with an antiretroviral combination containing a non lopinavir/r protease inhibitor (darunavir).

In conclusion, most of the patients in our study were virologically suppressed with CD4 > 500 mm³. Risk factors were the same as those described in other SARS-COV2 series, suggesting that HIV infection is probably not an independent risk factor for covid-19 infection. Mortality was 6,7%. Poorest outcomes and death were observed in patients with a high comorbidity score. Further studies are needed to investigate risk factors, clinical outcome and treatment options of SARS-COV2 in PLWHIV.

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The participants enrolled in this study gave their written consent to have their medical charts recorded in the medical record system NADis. The CNIL approved anonymized data extraction from electronic medical records (CNIL number 1171457, 24 May 2006). No further ethical approval is needed for French law on personal data protection.

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