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► **To cite this version:**

Valentina Isernia, Zelig Julia, Sylvie Le Gac, Antoine Bachelard, Roland Landman, et al.. SARS-COV2 infection in 30 HIV-infected patients followed-up in a French University Hospital. *International Journal of Infectious Diseases*, 2020, 101, pp.49 - 51. 10.1016/j.ijid.2020.09.1436 . hal-03493592

**HAL Id: hal-03493592**

**<https://hal.science/hal-03493592v1>**

Submitted on 24 Oct 2022

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

### **Hospital**

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## Short communication

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

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

As of April 27<sup>th</sup> 2020, with a total of 5327 PLWHIV followed-up at Bichat University Hospital in Paris, 30/5327 (0,5%) patients have been diagnosed for Covid-19, of whom 21/30 (70%) were inpatients and 9/30 (30%) 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 Infectious Diseases department with 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<sup>®</sup>, 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%) 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 [1] score  $\geq 3$ .

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 patient had a viral load  $> 10000$  copies/ml. CD4 count was  $>500$  cell/mm<sup>3</sup> 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 critic patient).

An antiviral treatment for SARS-COV2 was administered, in addition to HIV treatment, in 5/30 patients (16,3%): 3/30 (10%) patients received lopinavir/ritonavir and 2/30 (6,6%) hydroxychloroquine. Moreover, 5/30 (16,6%) 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, 76,7% in the study population). Main comorbidities were cardiovascular disease, hypertension, diabetes, obesity, and chronic renal disease, all being classical covid-19 risks factors described in others studies [2,3,4,5,6]

In a recent publication of 57.000 patients hospitalized with SARS-COV2 infection in 12 hospitals in New York City area, the median score of the Charlson Comorbidity Index was 4. [2]

In our population, only five patients (16,7%) had a Charlson comorbidity score  $\geq 3$ , but we included also 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 higher comorbidity score.

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

Most patients (90%) were virologically suppressed, with a CD4 >500 (76,6%), suggesting a role of already described risk factors, rather than immunosuppression, for SARS-COV2 infection.

Compared to others series of PLWHIV SARS-COV2 infected patients [7-8], a lower percentage of patients had specific antiviral treatment for Covid-19 (16,3%). Based on local guidelines, antiviral treatment was indicated only in hospitalized patients with severe disease (oxygen requirement > 3lpm).

Five patients in our study population were treated with an antiretroviral combination containing a non lopinavir/r protease inhibitor (darunavir). ~~supporting the lack of efficacy of this treatment for SARS-COV2 infection.[9]~~

In conclusion most of the patients in our study were virologically suppressed with CD4>500 mm<sup>3</sup>. 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.

The authors certify that they have NO affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter discussed in this manuscript.

The author received no specific funding for this work.

The participants enrolled in this study gave their written consent to have their medical chart 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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**Clinical characteristics and outcomes of HIV patients diagnosed of covid-19**

	<b>Comorbidities (Charlson score) [1]</b>	<b>BMI kg.m-2</b>	<b>CD4 cells/ μL</b>	<b>HIV viral load Copies/ml</b>	<b>ART-regimen before admission</b>	<b>SARS-COV2 PCR</b>	<b>Clinical status* D30</b>	<b>Outcomes</b>
<b>Patient 1</b>	Hypertension, dyslipidemia, hypertensive cardiomyopathy, chronic renal failure (1)	36,2	350	<20	abacavir + lamuvidine + raltegravir + darunavir + ritonavir	yes	1	Cured
<b>Patient 2</b>	None (0)	34,9	1010	<20	tenofovir alafenamide + emtricitabine + elvitegravir + cobicistat	yes	1	Cured
<b>Patient 3</b>	None (0)	23,9	720	<20	dolutegravir + rilpivirine	yes	1	Cured
<b>Patient 4</b>	None (0)	24,8	620	<20	tenofovir alafenamide + emtricitabine + elvitegravir + cobicistat	yes	1	Cured
<b>Patient 5</b>	None (0)	29,3	1020	<20	rilpivirine + emtricitabine + tenofovir alafenamide	yes	1	Cured
<b>Patient 6</b>	37 weeks pregnancy, recurrent herpetic infection (0)	26,6	640	<20	abacavir + lamuvidine + nevirapine	yes	1	Cured
<b>Patient 7</b>	Hypertension, diabetes, disseminated cryptococcosis (4)	21,1	40	14164	bictegravir + emtricitabine + tenofovir alafenamide + darunavir + ritonavir + atazanavir + dolutegravir	yes	1	Cured
<b>Patient 8</b>	Hypertension, diabetes, stroke (1)	22,3	460	<20	tenofovir disoproxil + raltegravir + darunavir + ritonavir	yes	1	Cured
<b>Patient 9</b>	Hypertension, hypertrophic cardiomyopathy, kidney transplantation (1)	26,6	220	<20	bictegravir + emtricitabine + tenofovir alafenamide	yes	1	Cured
<b>Patient 10</b>	Kidney transplantation, stroke, pulmonary embolism (5)	24,6	140	<20	abacavir + lamuvidine + dolutegravir	yes	1	Cured
<b>Patient 11</b>	None (0)	29,5	460	<20	abacavir + lamuvidine + dolutegravir	yes	1	Cured
<b>Patient 12</b>	Hypertension (0)	39,8	910	<20	rilpivirine + emtricitabine + tenofovir alafenamide	yes	1	Cured
<b>Patient 13</b>	None (0)	29,0	900	<20	tenofovir alafenamide + emtricitabine + elvitegravir + cobicistat	yes	1	Cured
<b>Patient 14</b>	Diabetes, hypertension, chronic renal failure, dialysis (2)	40,0	870	<20	abacavir + lamuvidine + dolutegravir	yes	7	Death
<b>Patient 15</b>	Pulmonary tuberculosis (0)	23,1	980	<20	tenofovir alafenamide + emtricitabine + elvitegravir + cobicistat	yes	1	Cured
<b>Patient 16</b>	Hypertension, diabetes, atrial fibrillation, ischemic stroke, prostatic adenocarcinoma (1)	32,8	390	<20	tenofovir alafenamide + emtricitabine + elvitegravir + cobicistat	yes	1	Cured
<b>Patient 17</b>	Diabetes with microangiopathic complications, dementia (3)	31,6	620	<20	abacavir + lamuvidine + dolutegravir	yes	1	Cured
<b>Patient 18</b>	None (0)	29,8	910	<20	tenofovir disoproxil + nevirapine	yes	1	Cured
<b>Patient 19</b>	Hypertension, diabetes, ischemic stroke, chronic renal failure, COPD, pulmonary embolism (3)	28,1	570	<20	abacavir + lamuvidine + dolutegravir	yes	7	Death
<b>Patient 20</b>	Dilated cardiomyopathy (1)	29,3	810	<20	rilpivirine + emtricitabine + tenofovir alafenamide	Neg	1	Cured
<b>Patient 21</b>	Severe cervical dysplasia, esophageal ulcer (0)	28,7	1109	<20	tenofovir disoproxil + doravirine + lamuvidine	ND	1	Cured
<b>Patient 22</b>	Diabetes, ischemic stroke (1)	29,7	240	<20	rilpivirine + emtricitabine + tenofovir disoproxil	Neg	3	Hosp
<b>Patient 23</b>	Hypertension (0)	24,6	830	<20	tenofovir alafenamide + emtricitabine + elvitegravir + cobicistat	ND	1	Cured
<b>Patient 24</b>	Bipolar disorder (0)	28,4	770	<20	rilpivirine + emtricitabine + tenofovir disoproxil	ND	1	Cured
<b>Patient 25</b>	None (0)	28,7	1190	39	tenofovir disoproxil + emtricitabine + elvitegravir + cobicistat	yes	1	Cured
<b>Patient 26</b>	Alcoholism, delirium tremens, dilated cardiomyopathy (1)	31,6	200	65	maraviroc + darunavir + ritonavir + dolutegravir	yes	3	Hosp
<b>Patient 27</b>	Depressive disorder (0)	24,1	650	<20	rilpivirine + emtricitabine + tenofovir alafenamide	ND	1	Cured
<b>Patient 28</b>	None (0)	21,0	585	<20	lamuvidine + dolutegravir	yes	1	Cured
<b>Patient 29</b>	Hypertension, diabetes, stroke, aphasia, ischemic heart disease (1)	21,2	630	<20	zidovudine + efavirenz + raltegravir + darunavir + ritonavir	yes	NA	Hosp
<b>Patient 30</b>	Hypertension, diabetes, carotid stenosis (1)	28,7	627	<40	tenofovir disoproxil + doravirine + lamuvidine	yes	6	Hosp

**The 7-point ordinal scale is an assessment of the clinical status [10]. 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