

Clinical features and outcome of COVID-19 among PLHIV in Gujarat, India: A case series

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ABSTRACT

Information on people living with HIV (PLHIV) and current COVID-19 pandemic is still scarce in Indian setting. This case series of PLHIV with COVID-19 describes clinical characteristics and outcome in this special group of patients. This case series included 11 confirmed cases of COVID-19 among PLHIV admitted at a tertiary care hospital in Gujarat, India during April-December 2020. This retrospective study was conducted by doing secondary data analysis from case records of patients for various variables including demographic, clinical characteristics, HIV-related parameters, and outcome (discharged/death). The mean age of patients was 39.2 years ranging from 20 to 55 years. Nearly, 18% (2/11) of patients had major comorbidities like diabetes and hypertension. All were taking antiretroviral therapy drugs with >95% drug adherence and had CD4 count ranging from 79/cu.mm. to 1189/cu.mm. Majority (91%) of patients recovered and were discharged while only one patient (9%) died during course of COVID-19 treatment. COVID-19 showed a similar clinical and epidemiological profile among PLHIV like other group of people. Further studies with large-sample size are recommended to find risks of COVID-19 among PLHIV and its impact on treatment outcomes.

Keywords: AIDS, COVID-19, HIV, SARS-CoV-2

Introduction

People living with HIV with advanced disease, those with low CD4 and high viral load, and those who are not taking antiretroviral treatment have an increased risk of infections and related complications in general.^[1] COVID-19 is a serious disease and all people living with HIV should take all recommended preventive measures to minimize exposure to, and prevent infection by, the virus that causes COVID-19.

At present, there is no evidence that the risk of infection or complications of COVID-19 is different among people

living with HIV who are clinically and immunologically stable on antiretroviral treatment when compared with the general population.

As per systematic reviews, very few studies have been conducted among PLHIV with COVID-19 coinfection but none from India.^[2-4] One study conducted in China about risk factors and antiretrovirals used among people living with HIV with COVID-19 reported similar rates of COVID-19 disease as compared to the entire population and increased risk with older age, but not with low CD4, high viral load level or antiretroviral regimen.^[5]

Currently, we have limited information about the risk of COVID-19 in people with HIV, but as they are having a compromised immune system, they are at a higher risk of getting SARS-CoV-2, the virus that causes COVID-19. So far in corona

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pandemic it has been seen that people who are vulnerable either due to age, comorbidity, malignancy, or immunocompromised are easily getting infected and high mortality also reported in this group of people.^[4,6] It would be interesting to know how the coexistence of these two viruses undertakes and effect of ongoing ART on SARS –CoV2 in Indian settings. Therefore, this is the first case series to learn more about how HIV and COVID-19 together impact on PLHIV in India. So, this study was conducted with objectives to determine epidemiological and clinical characteristics of COVID-19 among PLHIV and the outcome of COVID-19 in this special group of patients.

Materials and Methods

The case series included confirmed cases of COVID-19 among PLHIV admitted at tertiary care hospital attached to B.J. Medical College, Ahmedabad during April–December 2020. A confirmed case was defined by a positive result on SARS-CoV-2 polymerase chain reaction assay from nasopharyngeal sampling.

This retrospective hospital-based study was conducted by analyzing secondary data obtained from case papers of patients. We extracted following information from the case records of patients: (i) demographic characteristics including age, gender, marital status, education, occupation and socio-economic status, (ii) clinical history including addiction history and comorbidities, (iii) HIV-related information like risk factor, spouse status, HIV diagnosis date, date of ART initiation, CD4 count latest, ART regimen, ART drug adherence, viral load and WHO clinical staging and (iv) COVID-19-related information like symptoms at admission, date of COVID diagnosis, radiological findings – Chest X-ray, laboratory parameters (CRP, D dimer, HBsAg, Hemoglobin), treatment received (IV Remdesivir), ventilation required, outcome (Recovered/discharged, death), duration of hospitalization.

The extracted data was entered in Microsoft Excel worksheet. Descriptive statistics including means, standard deviation, medians, proportions and ranges were used to summarize data. Data analysis was done in Microsoft Excel.

Ethics

Ethics approval was obtained from Institutional Ethics Committee of the B.J. Medical College, Ahmedabad, India. Permission was obtained from GSACS and all the advisories. Strict data confidentiality was maintained by keeping data collection forms in cabinet with securable cabinet having lock and key. The electronic data was kept in a password protected computer accessible only to the investigators.

Results

This study reports 11 PLHIV with COVID coinfection. The mean (SD) age of patients was 39.2 (12.7) years ranging from 20 to 55 years. There were nine males and two females. Out of 11, only 2 had major comorbidity, namely, diabetes and

hypertension, while 1 was having Hepatitis B coinfection, 6 were anaemic and 6 had past history of tuberculosis. The mean duration since HIV diagnosis was 8.7 years ranging from 6 months to 18 years. Majority (7/11) were receiving ZLN and 4 were receiving TLE as ART regimen. Mean CD4 count was 586/cu.mm ranging from 79 to 1139/cu.mm. Only one PLHIV died, while others were discharged/recovered from COVID-19. The average hospital stay of patients was 15 days ranging from 3 to 54 days.

Discussion

This is first study, to our knowledge, reporting single centre case series of 11 PLHIV with COVID-19 infection in Indian setting. Since there was wide variation in age of patients ranging from 20 to 55 years, we could not observe any specific age wise distribution of COVID-19 among PLHIV. Similar finding was observed in studies conducted by Harter *et al.* in Germany and Ridgway *et al.* in Chicago.^[7,8]

As shown in Table 1, COVID-19 infection was observed in HIV naïve infected patients like 6 months since diagnosis to as long as even 18 years since diagnosis. All these 11 patients were taking ART drugs regularly with >95% drug adherence and all were provided standard treatment of COVID-19 as per guidelines. Similar findings were observed in studies conducted in Spain, China, Germany and New York.^[5,7,9,10]

Latest CD4 count among these PLHIV with COVID infection showed wide variation from 79 to 1139/cu.mm. As shown in Table 1, PLHIV number 1 with lowest CD4 count had maximum hospital stay of 54 days. However, that patient did not require any ventilatory support during hospital stay. On the contrary, PLHIV number 5 with high CD4 count of 1139/cu.mm. required ICU admission and ventilatory support and was discharged after 25 days. So, we could not establish any association between CD4 count and severity of COVID disease among PLHIV which may be due to small sample size. Similar findings were observed in studies conducted by Vizcarra *et al.*, Childs *et al.* and Suwanwongse *et al.*^[11-13] However, primary hypothesis is that PLHIV with higher CD4 count may have short hospital stay compared to PLHIV with low CD4 count, irrespective of severity of COVID-19. However, we need more data with large sample size to certain this hypothesis.

Majority (8/11 = 72%) of patients presented with fever and cough as chief complaints on admission, while three patients presented with breathlessness and two patients with diarrhoea and abdominal pain.^[8,14]

Chest X-ray abnormalities suggestive of COVID-19 with pulmonary involvement were observed in four patients (36%). Contrary to this a study conducted in New York city showed 89% chest X-ray abnormalities and Shalev Noga *et al.* reported 65% chest X-ray abnormalities among PLHIV with COVID-19 infection.^[13,14]

Table 1: Demographic and clinical profile of study participants (n=11)

Sr No	1	2	3	4	5	6
Age (in years)	32	45	43	30	54	45
Gender	Male	Female	Male	Male	Female	Male
Marital Status	Married	Married	Married	Married	Widowed	Married
Education	Illiterate	Sec. School	Sec. School	Sec. School	Graduated	Primary school
Occupation	Truck Driver	Job	Diamond Worker	Laborer	house wife	Laborer
SES class	1	1	1	2	4	2
H/o Addiction	No	No	No	No	No	No
Tobacco uses	No	No	No	No	No	No
Alcohol	No	No	No	No	No	No
Comorbidity	None	None	None	None	HT	None
History of Tuberculosis	No	Yes	No	Yes	No	No
Type of TB	NA	Extra pulmonary	NA	Extra pulmonary 2011	NA	NA
Any other associated illness	No	No	No	No	Seizure	No
HIV risk factor	trucker	Heterosexual	heterosexual	Blood transfusion	Unknown	Heterosexual
Spouse HIV status	Negative	Negative	Negative	Negative	Negative	Negative
HIV diagnosis	24-08-20	11-04-02	10-01-15	29-06-11	10-07-07	27-06-05
Years Since HIV Diagnosed	0.5	18	5	9	13	15
Date of start ART	05-09-20	21-08-09	19-01-15	19-07-11	23-06-09	02-06-08
Latest CD4	79	562	431	999	1139	1052
Date of CD4 testing	01-09-20	21-08-20	01-01-20	18-01-20	25-06-20	03-12-19
Current Regimen	TLE	ZLN	TLE	ZLN	ZLN	ZLN
Adherence (mainly in last 6 months)	>95%	>95%	100	>95%	>95%	>95%
Viral load (copies/ml)	Not available	230	20	22	TND (target Not detected)	Not available
current WHO Clinical State	II	I	I	I	I	I
Date of COVID diagnosis	24-08-20	28-07-20	03-07-20	29-05-20	24-07-20	22-05-20
Chief complain	right upper limb bulla formation with fever,	Chest pain, weakness, cough	cough, breathlessness since 4-5 days	Fever, breathlessness since 4-5 days	cough, fever, abdominal pain since 3 days, seizure disorder	fever, sore throat, dry cough, body ache since three days
Pulmonary involvement X ray	No	No	Yes	Yes	Yes	No
SPO2 at the time of admission	98%	97%	97%	96%	98%	98%
ventilator	No	No	No	No	Yes	No
Other important findings	Blood Transfusion given twice along with debridement	-	-	-	Bacterial meningitis, Seizure	-
Investigation			D-dimer: 0.5 (high), CRP: 18.5 (high), Fibrinogen: 199		D-dimer: 0.63 (high), Serum ferritin: 169.96 (high), CRP: 1.44 (high), Interlukin: 44.73 (high)	
Drugs					Remdesivir given	
Weight (kg)	53	70	73	79	58	68
HBS Ag	negative	negative	negative	negative	negative	negative
Hb (gm/dl)	8.9	11.1	14.4	14.7	9.4	12
Date of outcome	17-10-20	10-08-2020	13-07-2020	15-06-20	18-08-20	05-06-20
outcome	Discharged	Discharged	Discharged under home isolation	Discharged	Discharged	Discharged
Duration of stay in Hospital (days)	54	13	10*	17	25	14

Contd...

Table 1: Demographic and clinical profile of study participants (n=11)

Sr No	7	8	9	10	11
Age (in years)	24	55	54	20	29
Gender	Male	Male	Male	Male	Male
Marital Status	Single	Married	Married	Single	Single
Education	Sec. School	Graduated	Graduated	Sec. School	Graduated
Occupation	Job	Job	Job	Details Not Available	Skilled Worker
SES class	1	2	5	4	1
H/o Addiction	Yes	No	No	Yes	Yes
Tobacco uses	Yes	No	No	No	Yes
Alcohol	No	No	No	Yes	No
Comorbidity	None	None	HT	None	None
History of Tuberculosis	Yes	Yes	Yes	No	Yes
Type of TB	On TREATMENT	Extra pulmonary	Extra pulmonary -cured	NA	On TREATMENT
Any other associated illness	Pul TB, HBsAg Positive, RPR Positive	No	No	No	PUL. TB+Abdo TB 12/05/2020 and HEV Positive
HIV risk factor	unknown	unknown	unknown	Mother to child	Migrant
Spouse HIV status	NA	Negative	Negative	NA	NA
HIV diagnosis	05-05-20	02-07-04	24-12-10	30-05-12	29-01-20
Years Since HIV Diagnosed	0.5	16	10	8	0.5
Date of start ART	26-05-20	16-02-09	04-02-11	30-05-12	08-06-20
Latest CD4	131	870	649	374	161
Date of CD4 testing	06-05-20	18-02-20	20-08-19	12-11-19	08-06-20
Current Regimen	TLE	ZLN	ZLN	ZLN	TLE
Adherence (mainly in last 6 months)	>95%	>95%	>95%	>95%	>95%
Viral load (copies/ml)	Not available	TND (target Not detected)	54	Not available	Not available
current WHO Clinical State	III	I	I	I	IV
Date of COVID diagnosis	08-05-20	19-05-20	03-05-20	15-08-20	30-04-20
Chief complain	fever, dry cough, generalize weakness since 20 days	Fever, cough, diarrhoea	low grade fever, generalize weakness, breathlessness at rest, cough with expectoration since 3 days	Fever, diarrhoea, weakness	Weakness, cough, abdominal pain
Pulmonary involvement X ray	No	No	Yes B/L consolidation	No	No
SPO2 at the time of admission	98%		55% on air		
ventilator	No	No	Yes	No	No
Other important findings Investigation	-	-	RBS high, insulin started D-dimer:(high), 3.7, Serum ferritin: 1589 (high), CRP: 19 (high)	-	-
Drugs					
Weight (kg)	70	89	53	54	44
HBS Ag	positive	negative	Negative	negative	negative
Hb (gm/dl)	10.5		10.6	15.3	9.7
Date of outcome	10-05-20	29-05-20	07-05-20	29-08-20	03-05-20
outcome	Discharged under home isolation	Discharged	Expired	Discharged	Discharged under home isolation
Duration of stay in Hospital (days)	3*	10	4	14	3*

*discharged with advice of home isolation

In this study, out of 11 patients, 10 patients recovered and were discharged, while 1 patient died indicating mortality rate of 9% for this study. Similar findings were observed in different studies conducted by Harter *et al.* and Tuohy *et al.*^[7,9]

Regarding severity of disease, in this study, two patients needed ventilatory support and were admitted in ICU, of which one patient died. Both these patients were more than 50 years of age with other comorbidities like hypertension. One patient who died within 4 days of COVID diagnosis was having comorbidities including hypertension and diabetes and his investigations showed low viral load and high levels of CRP and D-dimer. The other patient who was on ventilator and had bacterial meningitis, treated with antibiotics and antivirals including remdesivir, showed clinical improvement and was discharged after 25 days of COVID diagnosis. We could not establish any specific clinical features in PLHIV with COVID-19 patients on ventilatory support. Similar finding was observed in a study conducted by Tuohy *et al.*^[9]

The specific challenges in clinical management of COVID-19 among PLHIV is to take care of critical issues like drug side effects, drug–drug interactions, taking care of mental health with dual viral infection in this group of cases.

It is imperative for primary care physicians to understand that the course of COVID-19 among PLHIV is almost normal as non-PLHIV and this knowledge would help them in counsel the patients.

There are some limitations in this study. First, it includes data from small number of subjects admitted to one tertiary care hospital. Second, data were extracted from case records of patients which may have some missing information or errors. Third, we have not taken any comparative group like COVID patient without HIV infection for further data analysis.

Conclusion

We did not find any unique or specific epidemiological or clinical characteristics among 11 PLHIV with COVID-19 infection in this study. COVID-19 showed similar clinical and epidemiological picture among PLHIV like other group of people. Although PLHIV are more vulnerable to COVID-19, but disease severity, clinical manifestations and outcome remain similar to other non-PLHIV COVID-19 patients. Further studies with large sample size are required to analyse the effect of COVID-19 among PLHIV in terms of mortality or other clinical parameters.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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