Case Report

COVID-19 IN ART NAÏVE HIV POSITIVE ADULT: COURSE OF PRESENTATION AND MANAGEMENT

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ABSTRACT

During the time of COVID-19 outbreak there is dilemma in diagnosis of acute lung infections. This is further hindered among immunocompromised patients due to bizarre clinical and radiological findings. We report young male severely immunocompromised HIV infected ART naïve patient presenting with acute onset of pneumonia and hypoxemia with SARS CoV-2 PCR positive.

Keywords: COVID-19, SARS-CoV-2, HIV, TB, Respiratory Infections

INTRODUCTION

The corona virus disease 2019 (COVID-19) was declared global pandemic on March 11, 2020 by World Health Organisation (WHO) after being first reported to the WHO China Country Office at the end of 2019 as pneumonia of unknown cause from the city of Wuhan in Hubei province, China.[1] The coinfection of the SARS-CoV-2 with other microorganisms may pose challenges particularly in terms of diagnosis and treatment, potentially affecting patient outcomes.[2] The role of HIV infection in contributing to risk of COVID-19 acquisition and disease severity have been less certain and current evidences does not suggest higher susceptibility to SARS-CoV-2 infection in HIV.[3-5] However people with HIV may have an increased risk for severe COVID-19 related outcomes, predominantly driven by comorbid medical conditions and opportunistic infections which may be more prevalent among people with HIV than in the general population.[6]

Pneumocystis pneumonia (PCP) is a one of the serious opportunistic infections in people living with HIV caused by the fungus *Pneumocystis jirovecii*.[7] The clinical picture of the fungal disease, Pneumocystis pneumonia, shares many overlapping features with the course of coronavirus disease 2019 (COVID-19) and hence possess diagnostic dilemma and presents diagnostic challenge in the COVID-19 pandemic.[8,9] Besides, Tuberculosis (TB) remains a main driver of morbidity and mortality among people with HIV and can accompany COVID-19.[6]

We present a case of 42 years Anti-Retroviral Therapy (ART) naïve male with advanced HIV who came to Sukraraj Tropical and Infectious Disease Hospital (STIDH), Kathmandu, Nepal with clinical and radiological features consistent with both pneumocystis pneumonia (PCP) and

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coronavirus disease 2019 (COVID19) . In this case report we discuss concern of Pneumocystis jirovecii, Tuberculosis and severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) coinfection and the difficulty in differentiating between the two diseases, especially in a resource limited setting where PCP is frequently diagnosed using case definitions and clinical experience.

CASE REPORT

A 42-year-old man from Kathmandu, Nepal presented with chief complaint of fever and cough for 8 days, shortness of breath for 7 days and anosmia for 6 days. Fever was mild to start with and was present throughout the day and not associated with chills and rigors. It was relieved on taking medications. Cough was dry in nature, more during night time, not associated with blood in the sputum. Shortness of breath was progressively increasing, more on exertion and relieved on rest. It was associated with bilateral wheeze. One day after the respiratory symptom, patient developed loss of smell. He was then suspected as a case of COVID-19 and tested for SARS-COV-2. RT-PCR showed positive results. Although, he was taking the medicines (Cefixime, Doxycycline, Paracetamol and Ibuprofen) his symptoms didn't improved and was increasing progressively. Later, he came to the emergency department of STIDH with complaint of respiratory distress.

Regarding the past history he was injecting drug user since 15 years of age together with his elder brother with regular practice of needle sharing. He was diagnosed with Human immunodeficiency virus (HIV) infection when one of his injecting drug partner fell ill and tested HIV positive. He didn't get Antiretroviral drugs (ART) in early days as National Program on HIV had limited supplies of ART. Later on, when ART was available, he was done multiple counselling, however he refused to take ART and remained ART naïve for many years.

Around 3 years back he developed painful vesicular lesions in the right side of the chest. Additionally, since few months he was having extensive seborrhoea of scalp and nasolabial folds. However, he didn't had history of weight loss, tuberculosis, opportunistic infections or history of chronic diseases. He was chronic alcoholic and denies smoking. He stays alone and works in an organization as a supervisor for living.

On presentation at emergency department, he had saturation of 67% in room air which improved to 97% on non-rebreathing mask (NRM) at 15 L/min, temperature recorded was 97°F, respiratory rate was 44 breaths/min, pulse rate was 115 beats/min and blood pressure was 100/70 mmHg.

On clinical evaluation patients had respiratory distress with use of accessory respiratory muscles. He was alert, conscious and responds to all the verbal communication. He had oral candidiasis, seborrheic dermatitis **(Figure 1 A)** and scar of past herpes zoster right at T 12 **(Figure 1 B)**. There was no lymphadenopathy. There were no neurological deficit and cardiovascular system looks normal on gross examination.

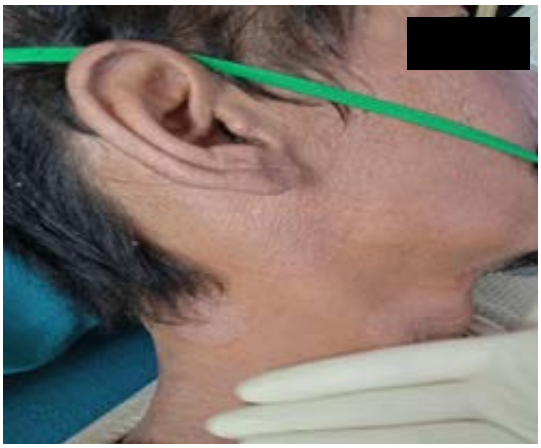

Figure 1 A: Seborrhei dermatitis

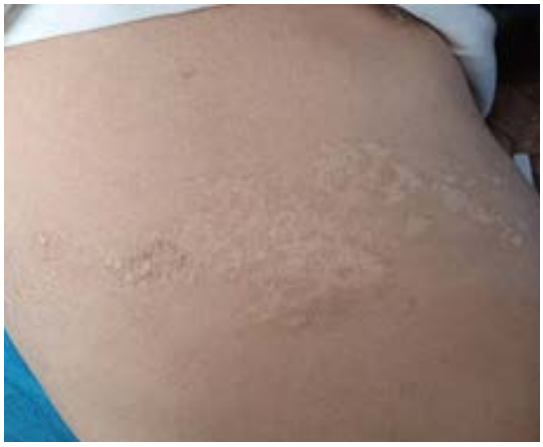

Figure 1B: Scar of past Herpes zoster

The condition of the patient deteriorated and was admitted in the intensive care unit on continuous positive airway pressure (CPAP). He was managed with antibiotics (Imipenem/Cilastin, Cotrimoxazole and Levofloxacin), Steroids, Heparin, Remdesivir and Convalescent plasma along with other

Table 1: Baseline Laboratory finding on admission to STIDH		
Lab findings	Findings	Reference
Complete Blood Count		
Total Leukocyte Count	9800/cumm	4,000-11,000/cumm
Neutrophils	84%	40%-75%
Lymphocytes	13%	20-45%
Platelets	5,85,000/cumm	150-400*1000/cumm
Haemoglobins	13.4 g/dl	13-17 g/dL
Liver function tests		
Alkaline Phosphatase	96 U/L	53-128 U/L
Alanine Aminotransferase	70 U/L	Up to 42 U/L
Aspartate Aminotransferase	138 U/L	Up to 37U/L
Renal function tests		
Urea	38 mg/dL	15-45 mg/dL
Creatinine	0.5mg/dL	0.4–1.4mg/dL
Serology		
HIV 1 and 2 Rapid	Positive	
Determine	Reactive	
Unigold	Reactive	
Statpack	Reactive	
HbsAg Rapid	Negative	
HCV	Negative	
Serum Cryptococcal Antigen	Negative	
Other tests		
Absolute CD3	265/uL	677-2383/uL
Absolute CD4	14/uL	424-1509/uL
Serum Ferritin	939ng/Ml	30-400ng/mL
D-Dimer	<0.1 mg/L	0-0.5 mg/L
C-reactive protein	Positive	
Serum Adenosine deaminase	57	0-15(Serum)
Sputum for AFB-1and 2	Negative	
Gene Xpert	MTB not detected	

supportive measures. Based on clinical, laboratory and radiological findings patient was started on ATT (HRZE).

Viral Load and CD4 count were also done to initiate the treatment in course with HIV. Antiretroviral Treatment (ART) was started according to National Guideline for initiating ART for people with HIV and TB coinfection which included 1)Tenofovir (TDF), 2) Lamivudine (3TC) and 3) Dolutegravir (DTG) with DTG given 50mg twice daily.(10) He was kept in CPAP for 13 days with additional 13 days in oxygen supplementation. Patient gradually improved and was discharged after 26 days of admission.

Absolute Lymphocyte count was 384 /uL (reference range: 990-3150), CD3 was 68.98% (reference range: 59-83), Absolute CD3 was 265 /uL (reference range: 677-2383), CD4 was 3.70% (reference range: 31-59) and Absolute CD4 was 14/uL (reference range: 424-1509). HIV-1 Viral Load via Quantitative PCR was 183555 copies/ mL.

Figure 2: Radiographic findings of patient after admission

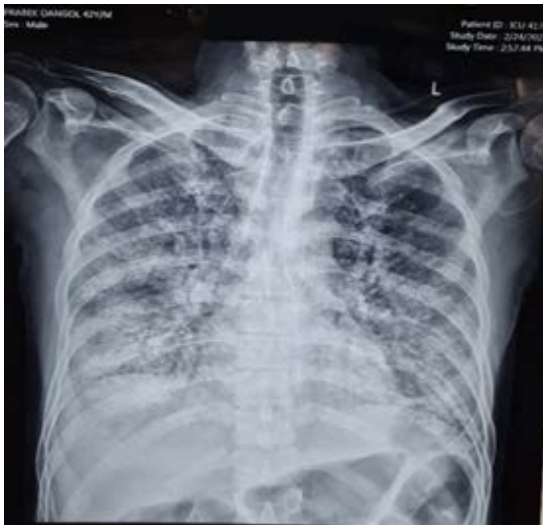

Figure 2A: X ray findings

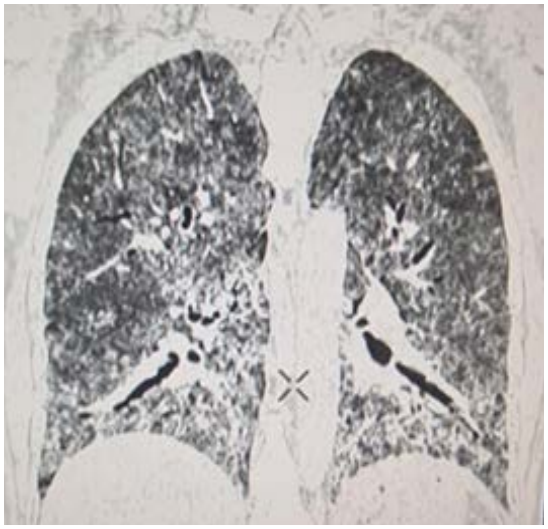

Figure 2B: HRCT Chest

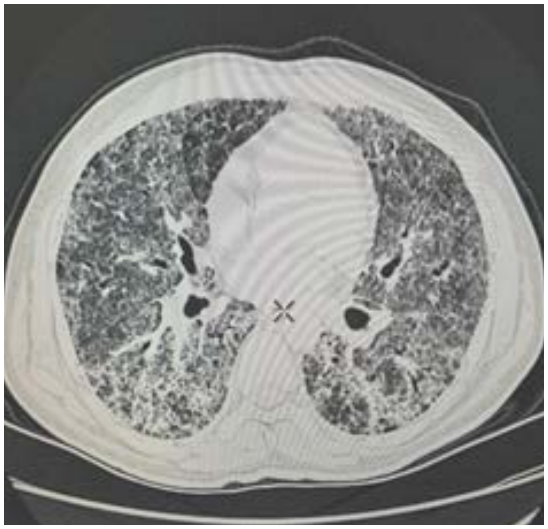

Figure 2C: HRCT Chest

Chest X-ray showed diffuse infiltrations over bilateral lungs **(Figure 2A)**. High-resolution computed tomography (HRCT) showed diffuse ground glass opacities with vascular dilatations with diffuse areas of interlobular septal thickening and tiny nodular densities scattered in bilateral lungs along with bronchiectasis changes. The changes were more in the lower lobes compared to upper lobes. **(Figure 2B)** Few mediastinal lymph nodes were enlarged along with calcifications. **(Figure 2B and 2C)**

DISCUSSION

This case report represents the unique finding identified during COVID-19 pandemic in Nepal. The major highlights of the study were that the patient is ART naive HIV positive with RT -PCR positive for SARS-COV2, presenting with overlapping clinical and radiological features of COVID-19 Pneumonia, Tuberculosis and Pneumocystis Pneumonia. This picture gives us various dimensions of health conditions which has to be thought of before reaching the final diagnosis.

Our patient was had an underlying immune defect characterised by absolute lymphopenia and low CD4 count and was ART naïve, which could have predisposed the patient independently to SARS-CoV-2, P. jirovecii infection, Tuberculosis and other opportunistic infections. HIV infection without ART may be a very serious comorbidity of COVID-19 as COVID-19 was found to cause rapid augmentation of the process of T-cell exhaustion initially caused by HIV.[11] Patient with COVID-19 can become critically ill and develop Acute Respiratory Distress Syndrome (ARDS) and due to their immunocompromised status may have opportunistic infections leading to increased severity of the disease.[12,13] Besides, HRCT Chest was notable for diffuse bilateral ground-glass opacities with patchy bands of atelectasis and tiny nodular foci of consolidation along with bronchiectasis. Ground glass opacities have been described to accompany COVID-19 pneumonia, Tuberculosis as well as Pneumocystis Pneumonia, thus creating diagnostic dilemma. [7, 9, 14, 15]

This case reports highlights the important role of microbial coinfection in the occurrence and development of SARS-CoV-2 infection which can raise difficulties in diagnosis, treatment and

prognosis of COVID-19 in the context of resource limited settings.

CONCLUSION

Our case emphasized on the fact that other causes of respiratory distress should not be overlooked by the mere presence of SARS-CoV-2 infection and high index of suspicion should be done for opportunistic infections while treating immunosuppressed patient.

CONFLICT OF INTEREST

None

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None

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