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## **COVID 19 INFECTION IN A PATIENT NEWLY DIAGNOSED WITH HIV/TB COINFECTION – A CASE REPORT**

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**ABSTRACT:****Introduction -**

COVID 19 refers to infectious disease caused due to infection by SARS-CoV-2, which resulted in a pandemic in the year 2020, with continuing effects in some regions of the world. It chiefly causes a respiratory illness, with features ranging from fever and mild cough to breathlessness and hypoxemia, along with a secondary hyperinflammatory and hypercoagulable state. HIV/TB coinfection is, on its own, associated with a poor outcome, due to an increased propensity to secondary infections.

**Method & Discussion :**

Here, we describe the case of an elderly male admitted for COVID 19, but diagnosed as having HIV/TB coinfection, with generalised lymphadenopathy and other constitutional features. Treatment was instituted per protocol. He also developed a treatment-related immune reconstitution inflammatory syndrome (IRIS), which was appropriately managed, and was eventually discharged following recovery from COVID-19. ART and AKT, with prophylactic medications, were ongoing at the time of discharge.

**Conclusion :**

– HIV/TB coinfection is associated with a poor prognosis. There are no specific recommendations for management of superadded COVID-19. The number of reported cases is low, and treatment had been given for the respective disorders as per prevailing local protocols.

Keywords - HIV/TB coinfection, COVID 19 with HIV/TB, immune reconstitution inflammatory syndrome (IRIS), TB lymphadenopathy

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with features ranging from fever and mild cough to breathlessness and hypoxemia, along with a secondary hyperinflammatory and hypercoagulable state. HIV/TB coinfection is, on its own, associated with a poor outcome, due to an increased propensity to secondary infections.

**Discussion:**

Discussion of Case A 51-year-old male presented to the COVID19 outpatient department with complaints of low-grade fever, vomiting, dry cough in the last 6 days, and a swelling on the left aspect of the neck in the last 15 days. He had a history of chronic alcohol use, and no other known medical comorbidities. RTPCR for SARS-CoV-2 was positive, and he was admitted. On admission, he had an oral temperature of 99.1 deg F, pulse of 84/min, blood pressure 100/68 mm Hg and oxygen saturation of 96% on room air. General physical examination was remarkable for undernourished status (weight 45 kilograms), poor build and a scaphoid abdomen. On local examination, the swelling on his neck had approximate dimensions 3 cm x 3 cm x 2 cm and was nontender with normal overlying skin and temperature. Chest X-ray was normal and ECG showed normal sinus rhythm. Inpatient management was started as per then standard of care, with oral azithromycin, oral hydroxychloroquine, subcutaneous enoxaparin (40 mg SC 12 hrly) for COVID 19-associated coagulopathy, and other supportive medication. Blood investigations were sent as per local protocol, repeated as required. They were significant for low haemoglobin (7.3 g/dL), and raised ESR (106), CRP (92.67), and D dimer (3.14) values. Serum ferritin levels were normal, but rose later in the course of stay following progression of inflammation. The anaemia was more likely nutritional in etiology, as serum iron (12) and vitamin B12 levels (214) were also subnormal. He also had a raised HbA1c (7.4), and was diagnosed with type 2 diabetes mellitus.

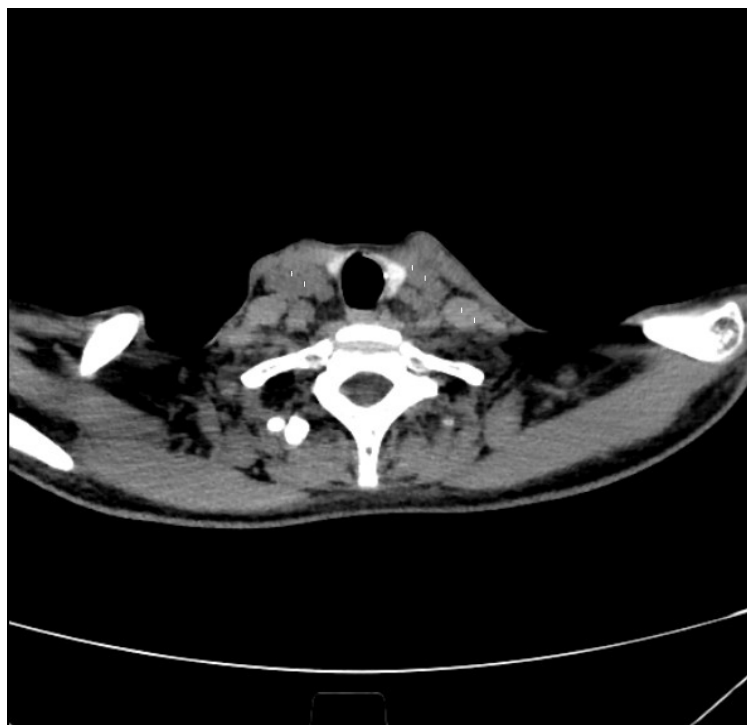
**Table 1. Inpatient laboratory investigations**

	Day 0	Day 20	Day 37	Day 55	Day 58
Hb (g/dL)	7.3	8.5	8.7	8.4	8.3
WBC (/µL)	6550	2650	6790	8150	5740
Platelets (/µL)	25400 0	26100 0	20900 0	16200 0	226000
Creatinine (mg/dL)	0.90	0.68	0.67	0.64	0.59
Sodium (mEq/L)	133	140	137	130	136
Potassium (mEq/L)	3.4	4.4	3.6	3.9	3.6
ALT (IU/L)	51	31	32	111	51
Albumin (g/dL)	2.9	2.9	2.6	2.4	2.4
CRP (mg/dL)	92.67	3.58	132.48	130.66	68.69
Procalcitonin (ng/mL)	0.75		0.19		0.22
D dimer (µg/mL)	3.14	2.40	2.80		
Ferritin (µg/L)	958	757	866.7	1349.2	1053.5

TIBC – 135 µg/dL; S. iron – 12 µg/dL; Vit B12 – 214 pg./mL; TSH - 6.54 mIU/L; HBA1C - 7.4%  
CD4 counts (/µL) – 30 (Day 0) → <20 (Day 30) → 210 (on follow up)

A rapid test for HIV was positive, which was confirmed on ELISA testing. CD4 counts were subthreshold (<20/microlitre). Local ultrasound of the neck swelling showed an approximately 3 x 7 cm sized hypoechoic collection in the subcutaneous and superficial intermuscular plane along left upper jugular chain and left posterior triangle (possibility of lymph nodal abscess), along with multiple subcentimeter sized and enlarged hypoechoic lymph nodes along the left jugular chain, bilateral posterior triangle, right mid and upper jugular chain, and both supraclavicular regions, with few of them showing conglomeration along left mid and upper jugular chain. A screening ultrasound at the axillary and inguinal regions also demonstrated few subcentimetric, hypoechoic lymph nodes, with few showing conglomeration in the left axillary region. Abdominal ultrasonography was significant for mild hepatosplenomegaly and multiple subcentimetric enlarged hypoechoic lymph nodes, without internal vascularity, in the central mesenteric, RIF, paracaval and periumbilical regions; largest measuring 36 x 40 mm in left paracaval region, reaching up to porta and causing indentation over the inferior vena cava.

A CT scan of the cervicothoracic region revealed necrotic bilateral cervical and upper abdominal lymphadenopathy with lymph nodal abscess formation on left side (Fig. 1 and 2), along with parenchymal nodules in superior segment of left lower lobe and anterior segment of right upper lobe, and changes of small airway disease in form of cystic bronchiectatic changes in lingular segment of left upper lobe and medial basal and posterior basal segments of right lower lobe (Fig. 3). The absence of any of the classical features of viral pneumonitis was noteworthy.



**Figure 1. Contrast CT scan of cervical region. Enlarged lymph nodes are marked with**

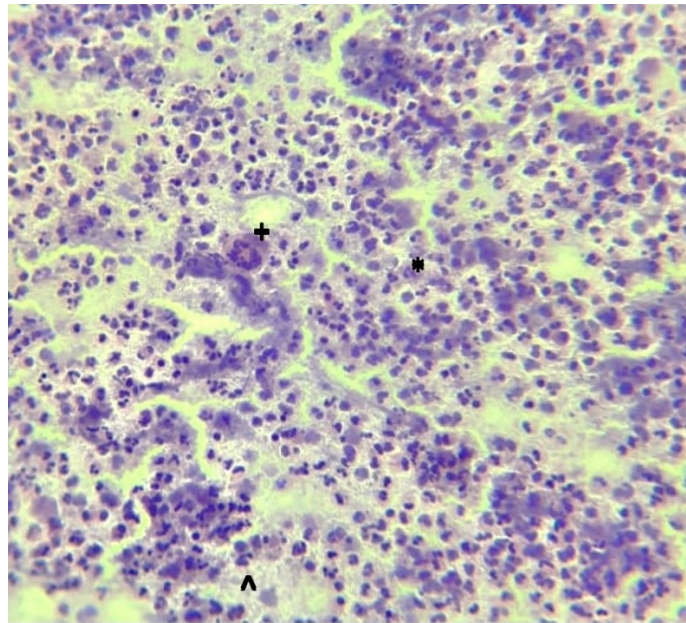


**Figure 2. Contrast CT scan of thorax. Enlarged axillary lymph nodes are marked with stars.**



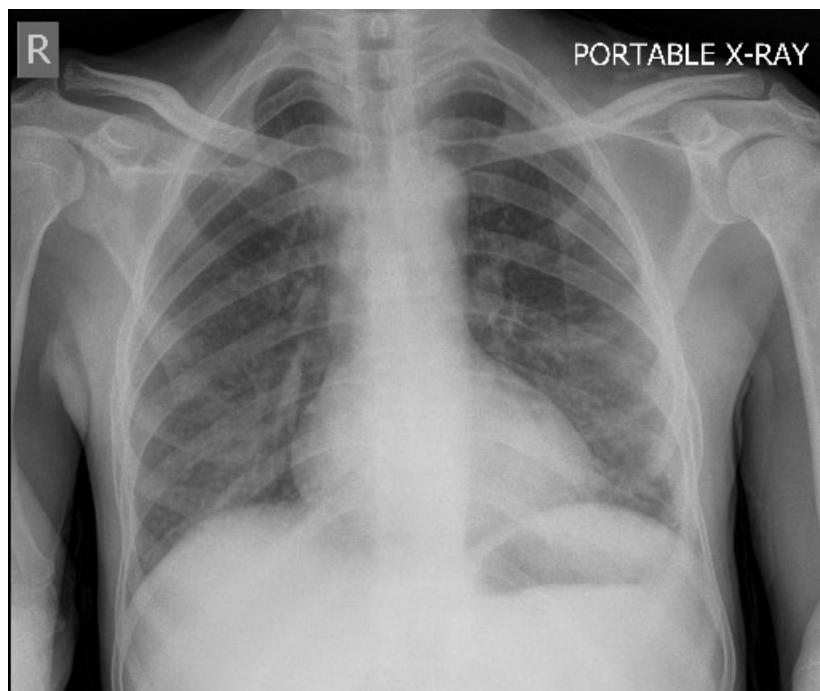
**Figure 3. Contrast CT scan of thorax, parenchymal window.**

Changes of bronchiectasis are seen in the right lung field (black arrowhead) and parenchymal nodules are seen in the left lung field (hollow arrowhead). Changes related to COVID-19 pneumonitis are absent. Surgery consultation was taken for the abscess, and oral antimicrobials with topical care were advised. Aspirate was taken from the lesion, which had a whitish and thick appearance grossly. Histologic examination demonstrated plenty of neutrophils, foamy macrophages, and few lymphocytes on a necrotic background, with few clusters of epithelioid-like histiocytes (Fig. 4). Part of the specimen was sent for staining for acid-fast bacilli and CBNAAT analysis. Staining was negative, and CBNAAT was positive for *M. tuberculosis*, with sensitivity to rifampicin.



**Figure 4. H&E slide from abscess material (10x). Neutrophils (asterisk), granuloma cell (plus sign), and foamy macrophages (caret) are seen.**

The nodal centre for HIV/TB management was contacted, and first-line weight-based anti-tubercular therapy (intensive phase, with oral isoniazid, rifampicin, pyrazinamide, and ethambutol) was started. Antiretroviral therapy (oral tenofovir + lamivudine + efavirenz combination) was started 3 weeks later, following which the patient developed an increase in abscess size, intermittent fever spikes, along with appearance of a consolidation on a repeat chest X-ray (Fig. 5), and an increase in inflammatory markers. These suggested the development of immune reconstitution inflammatory syndrome (IRIS) in our patient, which was controlled using low-dose corticosteroids. Supplemental oxygen via nasal prongs was required.



**Figure 5. Chest X-ray (PA view) after initiation of ART and clinical suspicion of IRIS. Developing consolidation is seen in the left lower zone.**

He was discharged following two consecutive negative RTPCR swabs as per then government protocol for management of immunocompromised patients, with an advisory for regular follow up for HIV/TB medication and monitoring of viral response.

He had a CD4 count of 210 cells/microlitre on reports done 3 months later, suggesting a response to antiretroviral medication, without accompanying symptoms and/or signs of COVID19 recrudescence / reinfection.

**Discussion:** HIV/TB is associated with a poor prognosis, with roughly one-third of PLWH dying from TB-related causes. (1) Few cases of HIV/TB infection with COVID 19 superinfection have been described in literature, with varying outcomes – one case report described a 32-year-old female with newly-diagnosed miliary TB and HIV coinfection, showing recovery with standard regimen for HIV and TB infections (2). Another case report described two patients recovering from COVID 19 infection. One of the patients had a prior diagnosis of HIV infection and a past history of pulmonary TB, while the other was a PLWH newly diagnosed with pulmonary TB. (3) A series from Panama also describes two patients, one of whom required invasive mechanical ventilation, while the other was able to make a complete recovery with minimal supplemental oxygen support. (3) HIV has been associated with protective as well as deleterious effects. (1) A cohort study from South Africa reported an independently increased risk of mortality in COVID 19 infection with associated HIV and/or TB infection. (4) The diversion of healthcare infrastructure for managing the pandemic resulted in a disruption of routine services for the other illnesses, with interruption in medications potentially affecting treatment for these conditions. (1) It is also worth noting that in all of the cases described, management for all the coexisting conditions was done as per standard guidelines, with no instances of interactions being reported. Further information needs to be acquired regarding such cases in order to improve case management.

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