

Case Report

COVID-19 and Tuberculosis Coinfection: A Report of Two Cases

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DOI: <https://doi.org/10.24321/2454.325X.202103>

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How to cite this article:

Daga MK, Kumar N, Mawari G, Chand S, Aarthi J, Raghu RV, Sachdeva K. COVID-19 and Tuberculosis Coinfection: A Report of Two Cases. Int J Preven Curat Comm Med. 2021;7(1):20-24.

Date of Submission: 2021-02-27

Date of Acceptance: 2021-03-25

A B S T R A C T

COVID-19 and its sequelae are primarily known to affect the respiratory system. However, it can have varied manifestations affecting other systems as well. COVID-19 can lead to reactivation of tuberculosis which can have unusual extrapulmonary presentations as well. Coinfection of COVID-19 and tuberculosis is a risk factor for poor outcome. Here, we describe a series of two cases of COVID-19 with tuberculosis. In the first case, a patient who had apparently recovered from COVID-19 presented only a week later with polyserositis, and ultimately was diagnosed to be a case of disseminated tuberculosis. In the second case, the patient presented with COVID-19 and TB together. Clinicians must be aware and vigilant for this coinfection and complication in COVID-19 recovered patients even if they were of mild/ asymptomatic category.

Keywords: COVID-19, Tuberculosis, Coinfection, Post-COVID

Introduction

COVID-19, caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has resulted in a serious crisis in the global health system and has the case fatality rate as high as 26 per cent in hospitalised patients.¹ Presence of coinfection is one of the important aspects which affects the clinical outcome in these patients. Lansbury et al. in their meta-analysis of thirty studies reported a bacterial coinfection in about seven per cent of hospitalised COVID-19 patients.² In the Indian context, the presence of Tuberculosis (TB) should always be kept in mind as a coinfection because of the very high prevalence of TB. Tadolini et al. published a cohort of 49 patients with coinfection from eight countries.³ Motta et al. described a cohort of 69 patients in Italy with findings suggestive of higher mortality than expected in

cases where advanced forms of TB frequently occurred and were caused by drug-resistant strains of *M. tuberculosis*.⁴ Similar case reports of TB and coinfection with COVID-19 has been reported from India also.⁵ Here, we present two cases of SARS-CoV-2 with reactivation of TB.

Case Presentation

Case I

A 48-year-old male presented with complaints of fever for 5 days along with a sore throat. The patient was advised RT-PCR for SARS-CoV-2 in view of the ongoing pandemic. His report was positive and the patient was advised home quarantine as he was only mildly symptomatic and was maintaining saturation. The patient was given antipyretics and vitamin supplementation for this duration. The patient

got repeat RT-PCR done after 12 days which was negative and he was declared recovered from COVID-19. However, after one week, the patient again started developing low-grade fever (99-100°F), abdominal distention, and shortness of breath. On examination, he had a blood pressure of 110/70 mmHg, pulse rate of 88/min, respiratory rate of 20/min and SpO₂ of 96% on room air. Air entry was absent in right infrascapular and infraaxillary area. The abdomen was distended suggestive of ascites.

The patient had anaemia with haemoglobin of 9.0 g/dl. Rest of the blood picture, kidney function tests, and liver function tests were normal. This time his RT-PCR for COVID was negative. ECG showed sinus rhythm. Chest X-ray was suggestive of right pleural effusion (Figure 1). The ultrasound of the abdomen was suggestive of gross ascites with mesenteric thickening throughout the abdomen and no features suggestive of chronic liver disease or kidney disease were seen. The ascitic fluid analysis revealed an exudative picture (460 cells, 80% mononuclear, 20% polymorph; sugar 42 mg/dL, protein 4.8 g/dL). ADA in ascetic fluid was 34 IU/L. Pleural fluid analysis showed similar findings (300 cells, 90% mononuclear, 10% polymorph; sugar 115 mg/dL, protein 5.9 g/dL). ADA in pleural fluid was 37 IU/L. Malignant cells or AFB positive cells were not seen in ascitic or pleural fluid. CECT chest and abdomen was done which was suggestive of tuberculosis (Figure 2). 2D echo was done which revealed mild pericardial effusion (Figure 3). Tuberculin sensitivity test (TST) was positive with induration of 15 mm. Based on the clinical findings and report of TST, the patient was started on first-line antitubercular therapy (ATT). The patient improved significantly on regular treatment with ATT and is currently asymptomatic after 1 month of starting ATT.

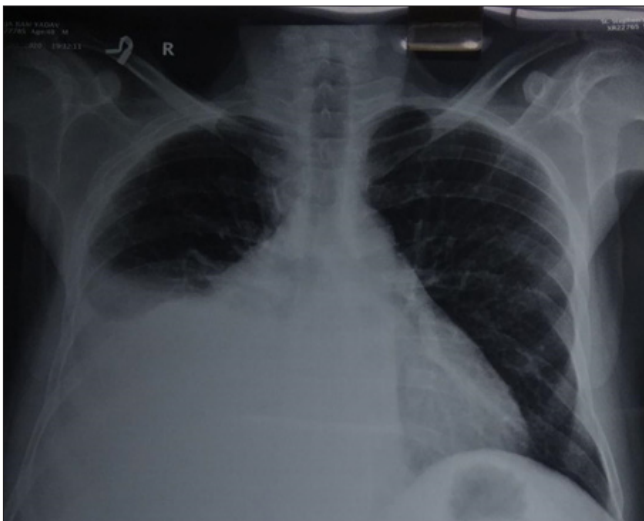


Figure 1. Chest X-ray PA View showing Right-sided Pleural Effusion

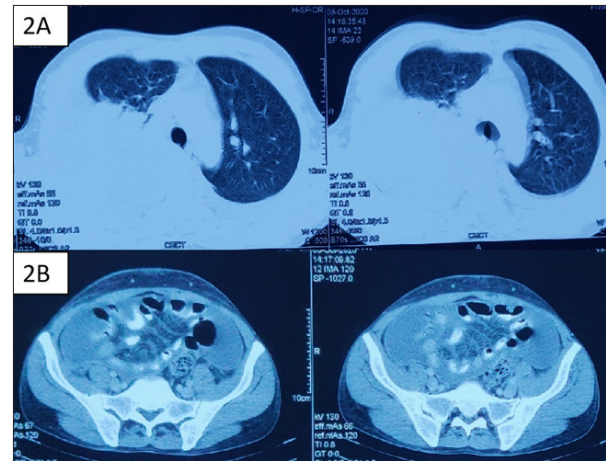


Figure 2. CECT Chest and Abdomen. (2A). Bilateral Pleural Effusion with Ascites. (2B). Mild Diffuse Smooth Peritoneal Thickening along with Thickened Heterogenous Omentum

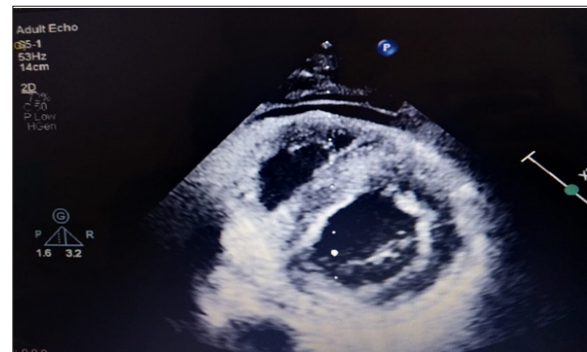


Figure 3. 2D Echo showing Bilateral Pleural Effusion with Mild Pericardial Effusion with Normal Left Ventricular Systolic Function and No Evidence of Tamponade

Case 2

A 54-year-old man with a history of pulmonary TB since 15 years and known comorbidity of post tubercular sequelae, chronic obstructive pulmonary disease, and dilated cardiomyopathy on regular treatment was admitted to our hospital. He presented with complaints of fever, cough (non-productive), and shortness of breath on exertion for the last 3 days. He had been diagnosed with COVID-19 based on a positive RT-PCR report. At the time of the presentation, his BP was 108/60 mmHg, pulse rate was 120/min, respiratory rate was 30/min and SpO₂ was 85% on room air which improved to 96% with 10L oxygen via non-rebreather mask. Chest X-ray showed confluent and discrete nodular opacities in bilateral lung fields and fibro-bronchiectatic changes (Figure 4). Laboratory abnormalities included slight leukocytosis with a neutrophilic predominance and raised IL6- 71.3 pg/mL (Table 1). He was managed with IV antibiotics, remdesivir, and oxygen supplementation. As he

did not have sputum production, sputum for AFB/ CBNAAT could not be done. CECT chest, done next, was suggestive of reactivation of TB (Figure 5.A,B,C). Antitubercular therapy was added. However, his condition deteriorated rapidly and he succumbed to the illness on day three.



Figure 4. Chest X-ray PA View: Few Confluent and Discrete Nodular Opacities seen in Right Upper, Middle, and Lower Zone with Areas of Breakdown. Fibrous and Fibro-bronchiectatic Change seen in Bilateral Upper and Middle Zone with Pulled up Hilum and Volume Loss in Right Upper Zone

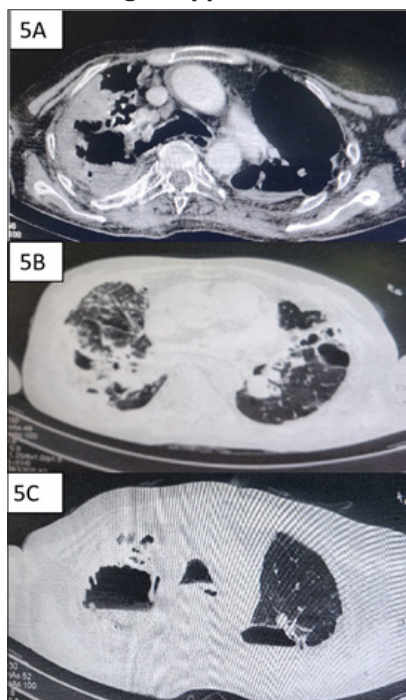


Figure 5. CECT Chest. (5A). Multiple Discrete Sub-centremetric Lymph Nodes seen in Right Paratracheal and Subcarinal Location. Multiple Reticulonodular Opacities seen in both Lung Fields. (5B). CECT Chest: Multiple Areas of Opacities with Fibro-bronchiectatic changes. (5C). CECT Chest: Multiple Thin-walled Cavities in Bilateral Upper Lobes, and few Cavities showing Air Fluid Levels within

Table 1. Investigations of the Patient

Parameter	Value
Hb	12.9 g/dL
TLC	12750 / mm ³
DLC	P88 L10
Platelets	2.07 /mm ³
D-dimer	557 ng/mL
IL6	71.3 pg/mL
PCT	2.24 ng/mL

Discussion

The symptoms of COVID-19 caused by SARS-CoV-2 consist primarily of the respiratory system. Fever, myalgia, sore throat, and shortness of breath are some of the common findings.⁶ Gastrointestinal symptoms such as anorexia, and diarrhoea have also been described in COVID-19.⁷ The common finding as detected on CT chest in COVID is bilateral lobular consolidation and bilateral ground-glass opacity.⁶ Although, pleural effusion and pericardial effusion are uncommon, they may be seen with disease progression.⁸ However, ascites and polyserositis have not been documented in COVID-19 and its sequelae.

This coinfection of TB and COVID-19 may be very relevant for countries with a high burden of TB. The complexity of identifying an association between the two may be due to multiple factors like an already existing high burden of TB, use of immunosuppressant drugs in COVID treatment protocol, and their similar presentation. It has also been postulated that a viral infection may activate dormant TB.⁹ A coinfection may be of greater concern because of the risk of increased mortality in view of dual infection and a huge impact on multiple systems in the country. As rightly pointed out by Kumar et al., physicians should be mindful of coinfection with TB, due to similar clinical presentation, otherwise TB may be overlooked in view of COVID positivity.⁵ Physicians attending to COVID-19 patients should always suspect and rule out TB in cases where – i) there is a history of tuberculosis in the past, ii) X-ray is suggestive of upper lobe involvement, iii) symptoms are present for more than 2 weeks. Finally, to find any association between the two, more cohort studies will be needed in the near future.

COVID-19 has caused a serious global health crisis even though almost four out of five patients are either asymptomatic or present with only mild symptoms.¹⁰ These patients are mostly managed in home isolation and are declared to have recovered roughly in two weeks. However, persistent symptoms have been described in patients of COVID-19. In a study of 143 patients from Italy, 87% of the

patients reported symptoms in follow up. A large number of patients reported fatigue and shortness of breath.¹¹ A systemic follow up has been warranted to monitor the development of pulmonary fibrosis as a COVID-19 sequelae.

Latent TB and reactivation of TB have to be kept in mind in India where the incidence of TB is very high.¹² It has already been postulated that viral infection reactivates dormant TB.⁹ Coinfection of TB with COVID-19 is a major clinical challenge due to their similar presentation with respiratory symptoms. However, TB can also present with extrapulmonary symptoms as in the first case mentioned above. It is generally believed that TB protects against developing a severe form of COVID.¹³ This is why the study on BCG vaccination in preventing the development of COVID-19 is ongoing. The ACTIVATE (NCT03296423) trial has shown that recent BCG vaccination in the elderly (> 65 years) protected them against new infections. It was demonstrated that incidence of new infections after BCG vaccination was 25% and after placebo vaccination was 42.3%, with most of the protection being against respiratory tract infections.¹⁴

Conclusion

COVID-19 can lead to reactivation of tuberculosis. Hence, reactivation of latent TB/ post-primary TB also needs to be considered when respiratory and other symptoms do not resolve in a specified time or reappear in post-COVID patients, especially in India where the prevalence of TB is so high. The follow up of post-COVID patients needs to be done vigilantly even in asymptomatic or mild cases.

Conflicts of Interest: None

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