

Case Report

A Case of COVID-19 Infection Complicated by Peripheral Neuropathy, Pulmonary Embolism, Lung Fibrosis and Tuberculosis: A Rare Case Report from Syria

Mais Yassin^{1*}, Isabell Mohanna², Rafah Jamouz³ and Mohammad Juneidi³

¹Department of Pulmonary Medicine, Tishreen University Hospital, Syria

²Department of Neurology Medicine, Tishreen University Hospital, Syria

³Department of Radiology Medicine, Tishreen University Hospital, Syria

Abstract

We report an interesting case of COVID-19 infection filled by complications (tuberculosis, pulmonary embolism, post COVID-19 lung fibrosis and Peripheral neuropathy). The patient was a 58 years old Syrian male. He reported to us in the emergency department with chief complaints of cough with expectoration associated with fever, chest pain, sore throat, headache, shortness of breath. His complaint started 10 days ago.

The diagnosis of tuberculosis in the current pandemic of COVID-19 required a high degree of suspicion to rule out the SARS-CoV-2 infection along with the infection of *Mycobacterium tuberculosis*, and because the clinical presentations in the two diseases are quite similar. Also there are many complications of COVID-19 infection, some are very rare, serious and life-threatening such: pulmonary embolism, peripheral neuropathy and fibrosis. Thus the present case will serve as a tool to help the clinicians handling cases of both the viral and bacterial infection across the globe, importance of giving attention to severe complications of COVID-19 infection and treatment them.

Keywords: Tuberculosis; COVID-19; Lung fibrosis; Peripheral neuropathy

Introduction

Coronavirus disease 2019 (COVID-19) is officially a pandemic. It is defined as illness caused by a novel coronavirus now called severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which was first identified amid an outbreak of respiratory illness cases in Wuhan City, China, then quickly spreading throw out the city. It was initially reported to the WHO on December 31, 2019. On January 30, 2020, the WHO declared the COVID-19 outbreak a global health emergency, on March 11, 2020, the WHO a global pandemic [1]. Most COVID-19 patients have respiratory symptoms and mild disease. A minority of patients, especially the elderly and individuals with underlying comorbidities, can develop life threatening features such as Acute Respiratory Distress Syndrome (ARDS), thromboembolic disease (like DIC, pulmonary embolism), and multi-system organ failure [2,3]. The incidence of PE in COVID-19 patients is unknown; some studies showed it is approximately nine fold higher than non

COVID-19 population [4].

There are many complications of COVID-19 infection. One of these is Neurological involvement which includes the Central Nervous System (CNS) and Peripheral Nervous System (PNS) [5]. Also there is an important complication called post COVID-19 pulmonary fibrosis, which is estimated to be affecting around one-third of the patients hospitalized with SARS-CoV-2 [6].

TB is a bacterial infection known to mankind for a long time. The disease is a major public health problem especially in the low-income countries of Asia, Africa and Europe. It is caused by *Mycobacterium tuberculosis* [7].

Case Presentation

Our patient is 58 years old, Syrian, male with no travelling history. He is active smoker (35 packet/year) with no history of alcohol consumption. He has no remarkable medical surgical or drug history. His complaint started about 10 days before he referred to our hospital with fever, chills, chest pain, cough with expectoration, sore throat, the patient has mentioned unprotected contact with cousin who has recently corona infected. Vital signs were an average heart rate of 128 beats per minute, blood pressure 11/7 mmHg, tachypnea, with a respiratory rate of 28 breaths/min, Oxygen Saturation (SPO₂) on air room 85%. Laborations showed elevated white blood cells (11.6×10^3), elevated CRP (65 mg/l) (Table 1).

Computed tomography (CT scan) completed on 11 November 2020 showed bilateral areas of interstitial densities, ground glass opacities with mainly a peripheral and lower lobes distribution (Figure 1).

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***Corresponding author:** Mais Yassin, Department of Pulmonary Medicine, Tishreen University Hospital, Lattakia, Syria, E-mail: maisyassin88@gmail.com

Table 1: Summary of the results of the patient's tests at the time of admission to the hospital.

Test	The first day of Admission	The fourth day	After 3 days of treatment
WBC	$11.6 \times 10^3/uL$	$13.6 \times 10^3/uL$	$12.6 \times 10^3/uL$
RBC	$3.19 \times 10^6 /uL$	$3.19 \times 10^6 /uL$	
HGB	9.00 g/dL	9.2 g/dL	
PLT	$220 \times 10^3/uL$	$320 \times 10^3/uL$	
CRP	65 mg/l	90 mg/l	60 mg/l
D Dimer	1400 mg/l	4,100 mg/l	2500 mg/l
PT	90% -14.3 sec	87%	
INR	1.13	1.26	
ALT	87 U/L	90 U/L	
AST	45 U/L	46 U/L	
LDH	900 U/L	1292U/L	

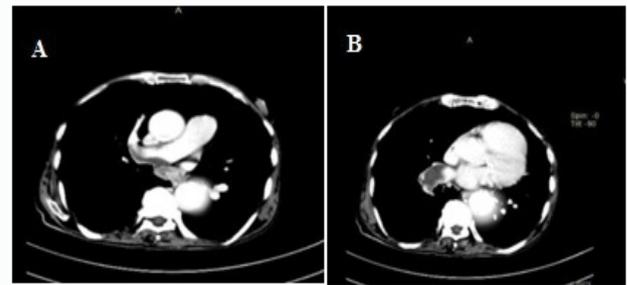
**Figure 1:** Bilateral areas of interstitial densities, ground-glass opacities with mainly a peripheral and lower lobe distribution.

The differential diagnosis of this pattern includes pneumonia, COVID-19, interstitial lung disease. A test for SARS-CoV-2 was performed using a throat and nasal swab and the result confirmed COVID-19 by Real-Time Polymerase-Chain-Reaction (RT-PCR) assays, and the COVID-19 IGM was positive, IGG was negative, which mean the patient is in the acute stage (Table 2).

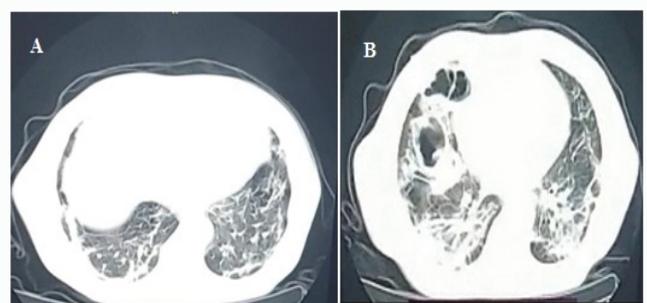
Table 2: Diagnostic tests of COVID-19 and TB.

Diagnostic tests of TB Genetic assay	8 January 2021 Gene Xpert Suptum (+)
Diagnostic tests of COVID- 19 Genetic assay (RT- PCR)assay	12 November 2020 Throat and nasal swab
COVID -19 IGM	Positive
COVID-19 IGG	Negative

After confirming the diagnosis, the patient has started on COVID-19 treatment (anti-coagulant-Remdesivir, dexamethasone). After 5 days of admission to the hospital the patient suddenly developed chest pain and hypoxia (SPO₂: 80%) with lower extremities weakness. Quickly we completed CT pulmonary angiogram and asked for a neurological consultation. CT pulmonary angiogram showed right main pulmonary artery embolism and right lower pulmonary artery embolism (Figure 2). The neurological consultation showed: absence of tendon reflexes, no sensory disturbance, no misarrangement, cerebrospinal fluid puncture is normal, CT scan of the brain is normal. Neurologist ruled out Guillain-Barre syndrome and suggested multiple peripheral neuropathies. We quickly started treatment for PE with blood thinners medication, alpha lipoic acid, Vitamin B12 and physical treatment. After three days of treatment we noticed significant clinical improvement (improvement of chest pain, shortness of breath, SPO₂: 92%).

**Figure 2:** CT angiography image of pulmonary embolism, showing (A) Right main pulmonary artery embolism. (B) Right lower pulmonary artery embolism.

The patient has been discharged in excellent condition with normal SPO₂ on air room, improvement in lower extremities weakness and follow up physical treatment. After four weeks of the discharge from the hospital, the patient started to suffer from increased shortness of breath on exertion, cough, hemoptysis, fatigue, loss of weight and fever. CXR showed: bilateral areas of parenchymal and interstitial densities in the lungs, predominantly in the upper fields (Figure 3). Ct scan showed: lesions typical of pulmonary tuberculosis with bilateral areas of interstitial densities suggest post COVID-19 pulmonary fibrosis (Figure 4). Thus we also ordered the Nucleic Acid Amplification Test (NAAT) that was performed on sputum specimens (Xpert MTB/RIF test) [8] and the result were positive with mycobacterium tuberculosis sensitive to rifampicin (Table 2).

**Figure 3:** Bilateral areas of parenchymal and interstitial densities, predominantly in the upper fields.**Figure 4:** Bilateral Paranchymal bands and fibrotic consolidation in the lower lobes. (B) Irregular thick walled cavitary lesions in the right lung.

We could not make pulmonary function test because the patient had hemoptysis and active tuberculosis. After confirming the diagnosis, the patient has started on tuberculosis therapy (INH+RMP+PZA+EMB) and low dose of corticosteroid.

Finally the patient has continued his tuberculosis therapy with drug tolerance and with no another complications of COVID-19 infection. At the end of tuberculosis therapy he has made CT scan which showed absence of the tuberculosis cavities, mild bronchiectasis in the front section of the right upper lobe with absence of lung fibrosis.

Discussion

This case has several important points to be noticed. The first point, the co-infection of TB and viral diseases like MARS, etc has been noticed in the past. Studies on association of TB and COVID-19 are few. Some Studies suggest that the pandemic has had negative effect on diagnosis TB, because delay or miss related to similarities in symptoms between both conditions. The relationship between TB and COVID-19 was noticed and suggested that TB infection may increase the probability to injury with severe COVID-19 and TB disease progression [9-10].

The second point, many patients also present a pro-coagulant state, which is biochemically detected by increased D-dimer levels and is related to complications and a worse prognosis. D-dimer levels >1000 ng/ml and chest pain as a clinical complaint were the strongest risk factors directly associated with PE development in COVID-19 patients. Thus start specific anticoagulant treatment, as recent data show that this is a safe treatment that should be provided to COVID-19 patients with PE [4].

The third point, Infection with SARS-CoV-2 causes not only pneumonia, but also neurological complication. Peripheral neuropathy is frequent and mostly results from immune mechanisms and neuro toxic side effects of drugs applied to treat COVID-19 such as (linezolid, lopinavir, ritonavir, hydro-chloroquine and glucocorticoids) and to a lesser extent, from the compression of peripheral nerves after prolonged bedding on the ICU [5].

The fourth point, post COVID-19 pulmonary fibrosis is an important complication; there is currently no clinical data on the frequency and mechanism of it. The management of this complication remains unexplored at large due to a lack of clinical trials. The role of anti-fibrotic drugs such as (pirfenidone and nintedanib), is suggested based on the similarity in the mechanism to idiopathic pulmonary fibrosis, thus they may be used even in the acute phase of COVID-19 pneumonia. Also some studies showed use prolonged low dose corticosteroid may prevent remodeling of lung. Finally there are many risk factors for the development of lung fibrosis include (Advanced age, comorbidities "such as hypertension, diabetes", severe of infection, Lab findings like "lymphopenia, elevated lactate dehydrogenase", prolonged ICU stay, duration of mechanical ventilation, smokers and alcohol abuse) [6].

The fifth point is our case is particularly interesting because therapeutic success was achieved despite the coincidence of COVID-19 complicated by TB, pulmonary embolism, lung fibrosis, peripheral neuropathy. The chest and general physicians should thinking and evaluating patients for co-infection TB and COVID-19 during the recent epidemic and they should giving attention to complications that can occur in COVID-19 infection like pulmonary embolism, lung fibrosis, peripheral neuropathy and treating them quickly as possible to improve progression.

We need large studies from several centers to find out the incidence, mortality rate, management guidelines for coinfection tuberculosis and COVID-19, and to investigate the occurrence and test the efficacy of already tested drugs such as antifibrotic for COVID-19 fibrosis.

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