

Prognosis and treatment of COVID-19 infection while receiving treatment for comorbid active tuberculosis: report of two cases

Aktif tüberküloz tedavisi sırasında gelişen COVID-19 enfeksiyonunun tedavi ve prognozu: İki olgu sunumu

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Abstract

Tuberculosis is still a serious public health issue in underdeveloped countries. There is presently little clinical experience with the co-existence of tuberculosis and COVID-19 infection, presented as the severe acute respiratory syndrome coronavirus 2 infection, which was first observed in China in December 2019. This case report details the diagnostic and treatment stages of two patients who had active tuberculosis and COVID-19 infection, as well as the outcomes of their therapies, both of which were effective.

Key words: tuberculosis, covid-19, co-infection

Öz

Tüberküloz, az gelişmiş ülkelerde hala ciddi bir halk sağlığı sorunudur. Tüberküloz ve COVID-19 enfeksiyonunun birlikteliği ile ilgili çok az sayıda klinik deneyim mevcuttur. COVID-19 enfeksiyonu ilk kez şiddetli akut solunum sendromu tablosu olarak Çin'de Aralık 2019'da görülmüştür. Bu raporda aktif tüberkülozu ve COVID-19 enfeksiyonu olan iki hastanın tanı ve başarılı olan tedavi aşamaları detaylı olarak sunulmuştur.

Anahtar kelimeler: tüberküloz, covid-19, koenfeksiyon

Introduction

More than 1.7 billion individuals (about 25% of the global population) are thought to be infected with *Mycobacterium tuberculosis*.¹ Since the first COVID-19 case was detected in late 2019 in Wuhan, China's Hubei region, more than 55 million cases and over 1 million fatalities have been documented globally.² The first COVID-19 case was discovered in our nation on March 11th, 2020, and more than 16.500.000 cases and over 100.000 deaths have been documented since then.³

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There is presently little information on the prognosis and management of COVID-19 infection in individuals receiving active pulmonary tuberculosis (TB) therapy. As a result, we sought to present two of our cases, who had TB and COVID-19, both of which are infectious illnesses that can be fatal.

Case-1

A 25-year-old male patient was admitted to our hospital complaining of a cough, fever, and fatigue. It was discovered that the patient was involved in a motor-bike accident approximately a month ago, which resulted in fractures in his left hand and left shoulder, and that he underwent surgery for the same reason. On respiratory auscultation, rales were heard in the right upper zone. His neurological evaluation also confirmed the existence of flaccid paralysis. Other systematic examinations revealed nothing else out of the ordinary. White blood cell count: $14.200/\text{mm}^3$, lymphocyte count: $800/\text{mm}^3$, neutrophil count: $12.500/\text{mm}^3$, hemoglobin concentration: 11.4 mg/dL, sedimentation rate: 62 mm/hour, and C-reactive protein concentration: 3.19 mg/dL were his laboratory test findings. His liver and



Fig. 1. A heterogeneous density increase in the right upper zone and a fracture in the left clavicle

renal function tests were in a normal range. During his hospitalization on his postero-anterior chest radiography indicated a heterogeneous density increase in the right upper zone and a fracture in the left clavicle (Fig. 1).

Thorax CT revealed consolidation with air bronchograms in the right upper lobe, in addition to significant micronodular infiltration regions, and a cavitary lesion with a diameter of about 1.5 cm in the apical section of the right upper lobe (Fig. 2a-c).

Sputum microscopy and a culture antibiogram were done on the patient, who was being evaluated for pulmonary tuberculosis. Direct microscopy revealed no acid-fast bacilli (AFB) in any of the three sputum samples examined. The sputum *M. tuberculosis* polymerase chain reaction (PCR) result was negative [Xpert MTB (*mycobacterium tuberculosis*) /RIF (rifampicin) Ultra test (Real-time PCR)]. Non-specific antibiotic therapy was continued until the patient's sputum *M. tuberculosis* culture test results were available. During antibiotic therapy, the patient's fever was detected at $38.5\text{ }^{\circ}\text{C}$. *M. tuberculosis complex* was isolated from the patient's sputum in two different cultures. Isoniazid, rifampicin, ethambutol, and streptomycin susceptibility were revealed. Treatments with isoniazid 225 mg, rifampicin 450 mg, pyrazinamide 1000 mg, and ethambutol 1000 mg were initiated. A SARS-CoV-2 RT-PCR nasopharyngeal swab sample was collected from the patient, because fever had returned on the tenth day of anti-tuberculosis medication. In compliance with Ministry of Health recommendations, favipravir therapy was begun for the patient who tested positive for COVID-19. The patient experienced no negative effects as a result of the anti-tuberculosis and favipravir therapy. The patient's clinical condition improved throughout his 14-day isolation in the COVID program, and his COVID-19 RT-PCR test resulted in a negative result. As a result, the patient's COVID-19 therapy was completed, but his anti-tuberculosis medication is still ongoing.

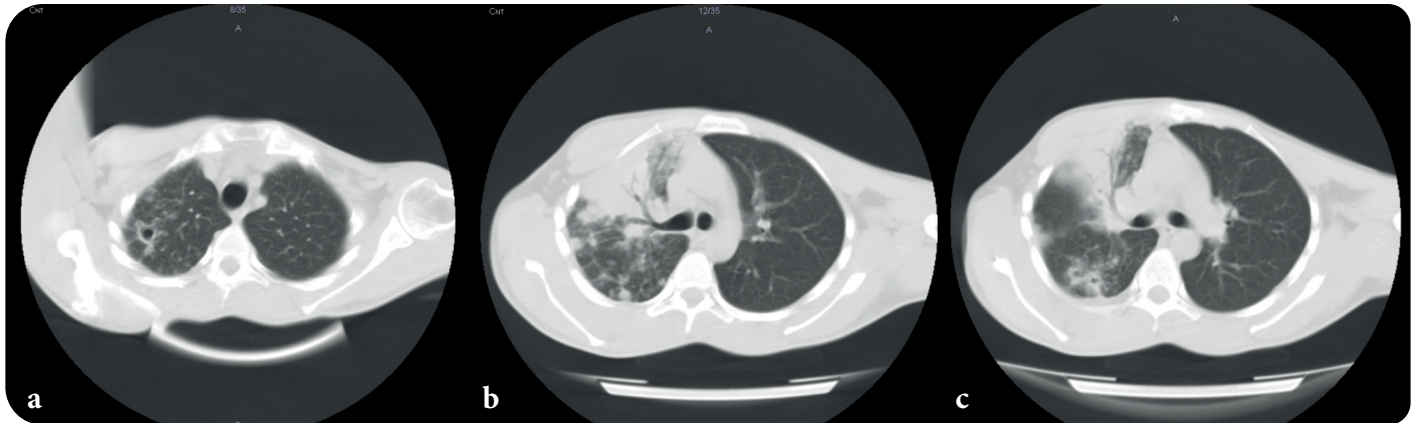


Fig. 2a-c. Consolidation with air bronchograms in the right upper lobe, in addition to significant micronodular infiltration regions, and a cavitary lesion with a diameter of about 1.5 cm in the apical section of the right upper lobe

Case-2

A 64-year-old male patient was referred to our hospital after his liver function test (LFT) revealed that his levels had risen while on anti-tuberculosis therapy. He didn't have any complaints. He was found to have a history of hypertension and to have undergone surgery for malignant melanoma on his left lower extremities about five months earlier. Due to mediastinal lymphadenopathy indicated by F-18 FDG (fluorodeoxyglucose) involvement in his positron emission tomography (PET)-CT scan taken during the surgical follow-up, the patient underwent an endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA). Owing to TB lymphadenitis, the patient was given anti-tuberculosis medication that included isoniazid, rifampicin, pyrazinamide, and ethambutol. His EBUS-TBNA material revealed *M. tuberculosis complex* growth, but his treatment was stopped due to hepatotoxicity.

His chest examination were normal, as were the findings of his other systemic exams. His laboratory test results were as follows: white blood cell count 5.800/mm³, neutrophil count 2.900/mm³, hemoglobin concentration 13.2 mg/dL, C-reactive protein concentration 0.43 mg/dL, aspartate aminotransferase (AST) concentration 57 U/L, alanine aminotransferase (ALT) concentration 47 U/L, and total bilirubin concentration 1.58 mg/dL. His renal function tests were also normal. The aortic ball was visible on his postero-anterior chest radiography recorded after admission, but the parenchyma was normal (Fig. 3).



Fig. 3. The aortic ball was visible, the parenchyma was normal

The patient, who was being monitored for hepatotoxicity without treatment, tested positive for COVID-19 based on the results of the RT-PCR (reverse transcription polymerase chain reaction) test, which was done during the regular examination for admission to the TB service. Due to the patient's high LFT values, favipiravir could not be provided, thus preventive enoxaparin sodium therapy was initiated. After 14 days of isolation, the patient's COVID-19 PCR test resulted in a negative result. During the follow-up period, the patient's LFT values declined, so he was given an anti-tuberculosis medication that included ethambutol,

rifampicin, and moxifloxacin. Because he did not develop hepatotoxicity throughout the follow-up period, isoniazid was added to his medication. The patient was discharged, whereas his anti-tuberculosis treatment currently continues.

Discussion

COVID-19 illness, which was proclaimed a pandemic by the World Health Organization (WHO) on March 11th, 2020, displays symptoms comparable to influenza, severe acute respiratory syndrome (SARS), middle east respiratory syndrome (MERS), and TB in general, despite distinctions in prognosis and sequelae.^{4,5} The majority of COVID-19 individuals experience mild symptoms; nevertheless, it worsens rapidly in people with comorbidities and advanced age.^{6,7}

There is very little clinical experience with TB and COVID-19 comorbidity. We described two examples of active TB in which the patients were infected with the COVID-19 virus during their therapy. According to a Chinese study, active or latent tuberculosis infection may enhance susceptibility to COVID-19 and the severity of the condition. According to this study, COVID-19 causes more severe symptoms in people who have both COVID-19 and TB.⁸ In each of our patients, the COVID-19 infection was modest. Our first patient had no symptoms other than a high temperature, and our second case had COVID-19 symptom-free.

Tadolini et al. reported a research on 49 individuals with active TB and COVID-19 comorbidity and found that 34 patients had pulmonary tuberculosis and 1 patient had extrapulmonary tuberculosis.⁹ The authors of this study provided the clinical features of patients in different age groups who have varied clinics, and despite the fact that the pandemic is still in its early stages, they concluded that additional instances of TB and COVID-19 comorbidity need to be examined.

In conclusion, we would like to report that our two cases, infected with COVID-19 while receiving active TB therapy, were effectively treated for COVID-19 and that their tuberculosis treatment is still ongoing.

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