

## CASE REPORT

# Co-infection of covid-19 in two patients with active tuberculosis: first case report in Afghanistan

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## ABSTRACT

**Key words:**

COVID-19, coinfection, SARS-CoV-2, pandemic, tuberculosis

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**Background:** Bacterial co-infections with respiratory pathogens are not uncommon. Currently, we are facing the SARS-CoV-2 epidemic, which is a very serious threat to public health. Because TB-Covid-19 infections are a major risk for TB, this is the first report from Afghanistan. Timely and rapid diagnosis of respiratory infections caused by COVID-19, and treatment of tuberculosis patients should be taken very seriously. **Methodology:** This study was conducted in Afghan Japan Hospital to investigate COVID-19 among 57 tuberculosis patients from April to January 2021, of which 23 patients had extrapulmonary tuberculosis and 34 patients had pulmonary tuberculosis. Nasopharyngeal swabs were taken from all patients and sent to the Microbiology Laboratory of the Hospital for the diagnosis of SARS-CoV-2. It was done using Real-Time Polymerase Chain Reaction (RT-PCR) method. The kit used was from BioVendor. (<https://www.biovendor.com>). **Results:** 57 patients with tuberculosis had an average age of 45.5 years. The patients included 29 (16.53%) men and 26 (14.82%) women. 2 people (1.14%) of tuberculosis patients were infection with covid-19. The history of two patients with Covid-19 is as follows. **Conclusions:** These results indicate the importance of investigating co-infections of covid-19 during the pandemic.

## INTRODUCTION

Bacterial and viral infections have caused epidemics and pandemics throughout mankind history. The pandemic of coronavirus disease 19 (COVID-19) caused by a novel beta-coronavirus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), and the epidemic of Tuberculosis (TB), a chronic infectious bacterial disease affecting the respiratory system caused by *Mycobacterium tuberculosis*, are the most important health crises worldwide, endangering lives and causing deaths <sup>1,2</sup>.

As of early June 2022, an estimated 529 million cases of COVID-19 have been identified and more than 6 million deaths have been reported all over the world <sup>3</sup>. COVID-19 and TB co-infection associated with high mortality and diagnostic and treatment challenges to the clinician because they have many radiological and clinical features in common <sup>4</sup>.

In the current case report study, two co-infection cases of active TB in COVID-19 patients have been reported and investigated for the first time in Afghanistan.

## CASE REPORT

### Case 1

A 41-year-old man from Mazar-e-Sharif was diagnosed with active pulmonary tuberculosis in June 2021, and after the virus was identified in the patient's swab sample, the patient was examined using the RT-PCR method. The clinical symptoms of this patient included myalgia, cough, body pain, lethargy, fatigue and fever. This patient also had hepatitis B and his liver enzymes were high. According to the patient's reports, he had no history of contact with people infected with Covid-19, but he only received one dose of Sinopharm vaccine. The patient's condition was not serious and he was quarantined at home after prescribing Sudak. After receiving the antiviral drug lopinavir and the antibiotic azithromycin, which was also under our supervision, the patient recovered completely.

### Case 2

A 46-year-old man living in Kabul, with active extrapulmonary tuberculosis who was diagnosed in March 2021, was examined after the identification of the Covid-19 virus in his throat swab sample through

RT-PCR. The patient's clinical symptoms included bruising, cough, fatigue and bone pain. Due to the importance of underlying diseases in the course of Covid-19, it was taken into consideration and reports were received from the patient. According to the tests and the patient's clinical record, we found out that the patient is suffering from acute lymphocytic leukemia (ALL) and goes to Pakistan for chemotherapy every month. According to the obtained information, the patient has not had any previous contact with patients with Covid-19. The patient's condition was very serious due to chemotherapy and he died after two weeks.

## DISCUSSION

Our study described, for the first time, the features of the TB and COVID-19 co-infected patients in Afghanistan. The results of the present case study emphasized the hypothesis that individuals with active TB are at higher risk of contracting COVID-19 due to alterations in lung immunity driven by host responses to SARS-CoV-2 virus. Also, case 2, which was reported in the present study was suffering from leukemia, which weakens the immune system and causes various types of viral and bacterial infections such as COVID-19 and tuberculosis. Immune system health has a critical role in morbidity and mortality of COVID-19 patients. In another study a higher percentage of deaths was recorded among COVID-19 patients with co-morbidities such as anemia<sup>5</sup>. These findings showed that comorbidity act as a facilitator of increased possibility of death in patients with COVID-19. Based on previous meta-analysis study, it has been found that the mortality rate was 2.21 times higher than COVID-19 patients without co-infections and co-infected individuals were 2.27 times more likely to develop severe COVID-19<sup>6</sup>. This high mortality rate in patients co-infected with COVID-19 and other bacterial and viral infections has also been reported in other previous studies<sup>7,9</sup>. Therefore, examining the disease history of people with COVID-19 is essential and very helpful for controlling their co-infections which, on the other hand, is effective in treating and reducing the possibility of death caused by COVID-19<sup>8</sup>. The most common clinical manifestations of COVID-19 and TB co-infection are fever, cough, dyspnea, fatigue and lethargy<sup>6,10</sup> which is consistent with the symptoms observed in the two cases of current study. According to former study COVID-19 and TB co-infection should be investigated in the presence of conditional symptoms, former immunodeficiency states, prolonged respiratory symptoms or fever and radiological abnormalities<sup>4</sup>. Our study also has many limitations: The lack of clinical and radiological information in the mentioned cases is due to the lack of access to this information because of restrictions and controls of the ruling government;

Statistical investigation was not possible because more samples were needed for statistical /meta-analysis. In conclusion, the co-infection of COVID-19 and active TB appears to be clinically manageable with proper care. Available data regarding COVID-19 and TB co-infection are insufficient to demonstrate a logical conclusion, thus warranting further prospective studies.

This manuscript has not been previously published and is not under consideration in the same or substantially similar form in any other reviewed media. I have contributed sufficiently to the project to be included as author. To the best of my knowledge, no conflict of interest, financial or others exist. All authors have participated in the concept and design, analysis, and interpretation of data, drafting and revising of the manuscript, and that they have approved the manuscript as submitted.

### Ethical approval and consent to participate

Written consent was signed by the patient after admission. Also, written informed consent The patient was asked to release the related data, all of which are available in the hospital records. No personal information was released and participants were not identified.

### Availability of data and material

The data is available with the author of the correspondence, but due to the current situation in Afghanistan, we did not have access to all the documents of the patients, but if needed, we can make them available to you.

### Guarantor

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