

• CASE PRESENTATION •

COVID-19 in a patient with active pulmonary tuberculosis: Co-morbid disease

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ABSTRACT

Many cases of Coronavirus Disease 2019 (COVID-19) have been detected in patients with Tuberculosis (TB) around the world, but data of patients with active TB during treatment with associated with COVID-19 infection is still scarce. This case report discusses, the clinical features, diagnosis and management of a patient with active pulmonary tuberculosis during the Continuation phase of treatment for tuberculosis, A sixty-seven-year-old patient with acute COVID-19 symptoms was mild. The patient was successfully treated for COVID-19 and continued to treat tuberculosis through home care and under the supervision of a medical team from the Chest and Respiratory Diseases Consultation Clinic in Najaf Governorate, in Iraq.

Key words: COVID-19, Tuberculosis.

INTRODUCTION

Pulmonary tuberculosis (TB) is the main cause of morbidity and mortality, especially in developing countries.¹ Pulmonary tuberculosis accounts for nearly 80% of other forms of tuberculosis and affects the lungs through its transmission through the air to people from the infected person.^{2,3} Tuberculosis is still the number one killer infectious disease in the world and continuing it during the COVID-19 pandemic is serious.⁴

Little is known about the relationship between COVID-19 and TB. Active TB may predispose to SARS-CoV-2 infection, more rapid development of its symptoms, and more severe COVID-19 infections.^{5,6} The symptoms of tuberculosis may be similar to that of COVID-19 though more insidious, like cough, fever, fatigue, shortness of breath.^{7,8} However, TB sometimes has different ways of diagnosis and complications. Experience with concomitant TB and COVID-19 is limited. The COVID-19 can occur before, simultaneously, or after the diagnosis of TB.⁹

Most cases of COVID-19 have mild symptoms

in most of the population, but people who suffer from comorbidities, such as the elderly, are more susceptible to COVID-19 infection, can develop fatal complications such as acute respiratory distress syndrome, lung failure, infections, and multi-system failure, so they need more care.^{6,10} This report briefly outlines the first case of COVID-19 in a patient with active pulmonary tuberculosis in Al Najaf, Iraq.

CASE PRESENTATION

A sixty-seven-year-old man with diabetes mellitus, diagnosed previously as pulmonary tuberculosis and on anti-tuberculosis drugs.

He was reviewed at the Chest and Respiratory Diseases Consultation Clinic of Najaf because of new development of fever (38° C), dry cough, fatigue, and muscle pain. PCR for COVID-19 on a nasopharyngeal sample was positive. The patients had been exposed to his neighbour who was infected with COVID-19.

The patient was presented to the Consultation Clinic for Chest and Respiratory Diseases in Al-Najaf Governorate complaining of few

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weeks history of cough, haemoptysis, chest pain, and fever. He had exposed to his brother who had pulmonary tuberculosis. Diagnosis at that time was made by detection of tuberculous bacillus by Zeik Nelson stain, culture and genXpert MTB/RIF test revealed Mycobacterium tuberculosis that is sensitive to rifampicin.¹¹ The patient was tested negative for human immunodeficiency virus. He started on isoniazid, rifampicin, pyrazinamide, and ethambutol for two months, then isoniazid and rifampicin alone up to the present and for four months in total. Interestingly, during the continuation phase of tuberculosis treatment, the patient returned to the Consultation Clinic for Chest and Respiratory Diseases, as he was suffering from mild fever and pharyngitis, knowing that one of his neighbours had COVID-19 after an epidemiological investigation of his area of residence. Two nasopharyngeal swabs by real-time Polymerase-Chain-Reaction (RT-PCR) for COVID-19 were positive.

Since the patient's condition was stable and the symptoms are moderate, he was isolated at home under a monitoring and necessary medical examination of a team consisted of a physician, a preventive medical assistant, and an assistants pharmacist. On follow up, the patient suffered from mild shortness of breath and desaturation of peripheral oxygen, SpO₂ was 92%. Auscultation of the chest was within normal. Chest X-ray showed right lower zone irregular opacity. The biochemical tests for liver, heart and kidneys and serum ferritin were normal. Erythrocyte Sedimentation Rate (ESR) and D dimer were moderately elevated. He was symptomatically by azithromycin, bromhexine hydrochloride, and paracetamol with some supplements like vitamin C, D₃, and zinc according to the WHO protocol approved by the Iraqi Ministry of Health.¹²

No side effects were reported for the treatment of tuberculosis/COVID-19, and the patient recovered from COVID-19 within two weeks after two nasopharyngeal swab were negative. The patient stayed for an additional two weeks in home isolation and was followed-up by the medical team until the end of his treatment for tuberculosis.

DISCUSSION

To the best of our knowledge, this is the first report on a patient with active tuberculosis and COVID-19 in Al-Najaf, Iraq. Our patient was 65 years, had diabetes mellitus, on maintenance phase of tuberculosis treatment, and get infected with COVID-19. So, he was a high risk candidate for infection with COVID-19 and for more severe form.⁵

The clinical features of active TB and COVID-19 are not entirely clear, and this may be due to limited data on people with COVID-19 and TB.^{10,13}

Recurrence of symptoms in a patient with tuberculosis under treatment after their disappearance raise many differential diagnosis like failure of treatment, appearance of a new resistant strain, secondary bacterial infection, and recently development of COVID-19 infection.

Tuberculosis and COVID-19 infection are both respiratory diseases,⁶ but COVID-19 infection is more acute and severe symptoms, while TB has an insidious onset.^{6,14} However, there is difficulty in the differential diagnosis. A study of 49 people with tuberculosis and COVID-19, 26 of whom had TB before infection with COVID-19.⁹ Tuberculosis is a chronic disease and has a long period of time for its development and its treatment,¹⁴ and it infected large number of people in 2019 10 millions were ill and 1.4 millions died because of TB.¹⁵ So, it is difficult to determine whether concomitant infection with COVID-19 in TB patients is an association or a causation.

In the above study, there were 19 patients out of 49 who had contracted COVID-19 infection during treatment for tuberculosis and showed little or no protection against COVID-19.⁹ There are still concerns about the effect of COVID-19 infection on the clinical status of active tuberculosis and its end results,¹⁶ but a study indicated a weak rate of clinical and radiological deterioration. In our patient, symptoms of COVID-19 were mild, the patient did not require hospital admission or the need for anti viral drugs, the radiological findings showed only the opacity due to tuberculosis, and laboratory results were within normal levels a part from high ESR and D-dimer that may be due to the

age of the patient rather than to being due to the tuberculosis its self.

The BCG vaccine may play a role in reducing morbidity and mortality, but the evidence is still insufficient and of low quality.¹⁷⁻²⁰ Our patient was not vaccinated with BCG previously. The interaction of first-line TB drugs with anti-viral for COVID-19 leads have been confirmed and may be harmful side effects,^{9,10} we did not encountered any side effects or drug interactions because our patient was not given antivirals. He recovered within weeks of COVID-19 and continued his TB treatment in a calm and stable manner.

CONCLUSION

The effect of COVID-19 on active TB may be limited and can be controlled to prevent the deterioration of the situation by taking appropriate care and adhering to the conditions of health prevention.

REFERENCES

- Jeong YJ, Lee KS. Pulmonary tuberculosis: up-to-date imaging and management. *American Journal of Roentgenology*. 2008 Sep;191(3):834-44.
- Agrawal M, Bajaj A, Bhatia V, Dutt S. Comparative study of GeneXpert with ZN stain and culture in samples of suspected pulmonary tuberculosis. *JCDR*. 2016 May;10(5):DC09.
- Swaminathan S, Rekha B. Pediatric tuberculosis: global overview and challenges. *Clinical infectious diseases*. 2010 May 15;50(Supplement-3):S184-94.
- Buonsenso D, Iodice F, Biala JS, Goletti D. COVID-19 effects on tuberculosis care in Sierra Leone. *Pulmonology*. 2020;27(1):67-69.
- Motta I, Centis R, D'Ambrosio L, García-García JM, Goletti D, et al. Tuberculosis, COVID-19 and migrants: preliminary analysis of deaths occurring in 69 patients from two cohorts. *Pulmonology*. 2020 May 14;26(4):233-240.
- Liu Y, Bi L, Chen Y, Wang Y, Fleming J, Yu Y, Gu Y, Liu C, Fan L, Wang X, Cheng M. Active or latent tuberculosis increases susceptibility to COVID-19 and disease severity. *Medrxiv*. 2020 Jan 1. doi: <https://doi.org/10.1101/2020.03.10.20033795>
- Guan WJ, Ni ZY, Hu Y, Liang WH, Ou CQ, He JX, et al. Clinical characteristics of coronavirus disease 2019 in China. *New England journal of medicine*. 2020 Apr 30;382(18):1708-20.
- Xu XW, Wu XX, Jiang XG, Xu KJ, Ying LJ, Ma CL, et al. Clinical findings in a group of patients infected with the 2019 novel coronavirus (SARS-Cov-2) outside of Wuhan, China: retrospective case series. *bmj*. 2020 Feb 19;368.
- Tadolini M, Codecasa LR, García-García JM, Blanc FX, Borisov S, Alffenaar JW, et al. Active tuberculosis, sequelae and COVID-19 co-infection: first cohort of 49 cases. *European Respiratory Journal*. 2020 Jan 1; 56(1): 2001398.
- Faqihi F, Alharthy A, Noor A, Balshi A, Balhamar A, Karakitsos D. COVID-19 in a patient with active tuberculosis: A rare case-report. *Respiratory Medicine Case Reports*. 2020 Jan 1;31:101146.
- Stevens WS, Scott L, Noble L, Gous N, Dheda K. Impact of the GeneXpert MTB/RIF technology on tuberculosis control. *Tuberculosis and the Tubercle Bacillus*. 2017 Sep;1:389-410.
- World Health Organization. Clinical management of COVID-19: interim guidance, 27 May 2020. World Health Organization; 2020.
- Centers for Disease Control and Prevention. A New Tool to Diagnose Tuberculosis: The Xpert MTB/RIF Assay. Atlanta, GA, USA: CDC. 2013.
- Khurana AK, Aggarwal D. The (in) significance of TB and COVID-19 co-infection. *European Respiratory Journal*. 2020 Aug 1;56(2): 2002105. DOI: [10.1183/13993003.02105-2020](https://doi.org/10.1183/13993003.02105-2020)
- Harding E. WHO global progress report on tuberculosis elimination. *The Lancet Respiratory Medicine*. 2020 Jan 1;8(1):19.
- Stochino C, Villa S, Zucchi P, Parravicini P, Gori A, Raviglione MC. Clinical characteristics of COVID-19 and active tuberculosis co-infection in an Italian reference hospital. *European Respiratory Journal*. 2020 Jan 1;56(1): 2001708.
- World Health Organization. SAGE working group on BCG vaccines and WHO secretariat. Report on BCG vaccine use for protection against mycobacterial infections including tuberculosis, leprosy, and other nontuberculous mycobacteria (NTM) infections. 2017.
- Usher NT, Chang S, Howard RS, Martinez A, Harrison LH, Santosham M, Aronson NE. Association of BCG vaccination in childhood with subsequent cancer diagnoses: A 60-year follow-up of a clinical trial. *JAMA network open*. 2019 Sep 4;2(9):e1912014-.
- Abbott S, Christensen H, Lalor MK, Zenner D, Campbell C, Ramsay ME, Brooks-Pollock E. Exploring the effects of BCG vaccination in patients diagnosed with tuberculosis: observational study using the Enhanced Tuberculosis Surveillance system. *Vaccine*. 2019 Aug 14;37(35):5067-72.
- Kumar J, Meena J. Demystifying BCG vaccine and COVID-19 relationship. *Indian Pediatr*. 2020;57(6):588-589.



Abbreviations list: Bacillus Calmette–Guérin (BCG), Coronavirus disease 2019 (COVID-19), Erythrocyte sedimentation Rate (ESR), Polymerase-Chain-Reaction (RT-PCR), Tuberculosis (TB), World Health Organization (WHO)

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