

COVID-19 AND TUBERCULOSIS PNEUMONIA COINFECTION: CASE REPORT**Rym Fakhfakh*, Imen Ben Hassine, Jihed Anoun, Monia Karmani, Fatma Ben Fredj, Anis Mzabi, Chadia Laouani**

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ABSTRACT

The coinfection with SARS-CoV-2 (COVID-19) and *Mycobacterium tuberculosis* (BK) has been reported in various parts of the world but it remains limited and the number of reported cases is minimal. This is the first report in the literature of COVID-19 infection superimposed on active pulmonary tuberculosis (TB), in a North African country (Tunisia). A 40-year-old man presented 1 month with fever, night sweats, productive cough and hemoptysis. The nasopharyngeal swabs confirmed COVID-19. Chest computed tomography (CT) scans revealed on the left lung micronodules, multiple cavitations and lingular bronchiectasis. Sputum smear microscopy identified acid-fast bacilli. A standard antituberculosis regimen and symptomatic treatment were started. Only Oxygen therapy (2-4 l/min) was needed. The course was marked by clinical improvement. He continued taking antituberculosis treatment for 6 months at least. This reported case highlights the diagnostic challenges of coinfection with COVID-19, in regions endemic for TB and the approach to managing a patient with both diseases.

KEYWORDS: Tuberculosis, pulmonary, COVID-19, coinfection.**BACKGROUND**

Little is known about the relationship between Coronavirus disease 2019 (COVID-19) and Tuberculosis (TB).^[1] Recent studies have indicated that individuals with either latent or active TB may be more susceptible to infection with severe acute respiratory syndrome Coronavirus 2 (SARS-COV-2), and the progression of the disease caused by this virus may be faster and more severe than in patients without TB.^[2]

Also, much attention was given from health systems because up to one-third of the world's population world is infected with BK and it remains a major cause of morbidity and mortality worldwide.^[3] In Tunisia, the incidence of TB was 9 to 10 cases/100 000 inhabitants between 2010 and 2014.^[4]

The first-ever global cohort of 49 cases of COVID 19/TB coinfection from 8 countries did not include any North African country because of the lacking data reported co-infection COVID 19 and TB.^[5] This report briefly outlines a case of COVID-19 in a patient with active tuberculosis in Tunisia.

CASE REPORT

A 40-year-old man, former smoker, presented for one month with fever, night sweats, cough with initially purulent sputum then the onset of hemoptysis of low to medium abundance and chest pain. It was associated with asthenia, mild dyspnea and pain throat. He was

vaccinated with BCG (Bacille Calmette-Guérin) and he didn't report contact with a patient confirmed to have COVID-19 or tuberculosis. Physical examination confirmed the fever (39°C) and showed tachycardia (109 bpm) and bilateral apical crackling rales on lung examination. His saturation of peripheral oxygen (SpO₂) was 94%, on room air. Blood tests revealed lymphopenia at 600/mm³ with normochromic normocytic anemia at 10.6g/dl, increase in C-reactive protein (137 mg/L), lactate dehydrogenase (197 UI/L), erythrocyte sedimentation rate (80 mm/hour), ferritin (397ng/mL) and d-dimer (1506 ng/mL). The Troponin was negative. The arterial blood gas indicated respiratory alkalosis. The nasopharyngeal swabs confirmed COVID-19 by Real-Time-Polymerase-Chain-Reaction (RT-PCR) assays. Chest computed tomography (CT) scans revealed on the left lung micronodules, multiple cavitations, especially, in the left upper lobe, lingular bronchiectasis, thickening of the interlobular septa (**Fig.1**). These lesions on CT provided a diagnostic hypothesis of an infectious or inflammatory process of granulomatous etiology.

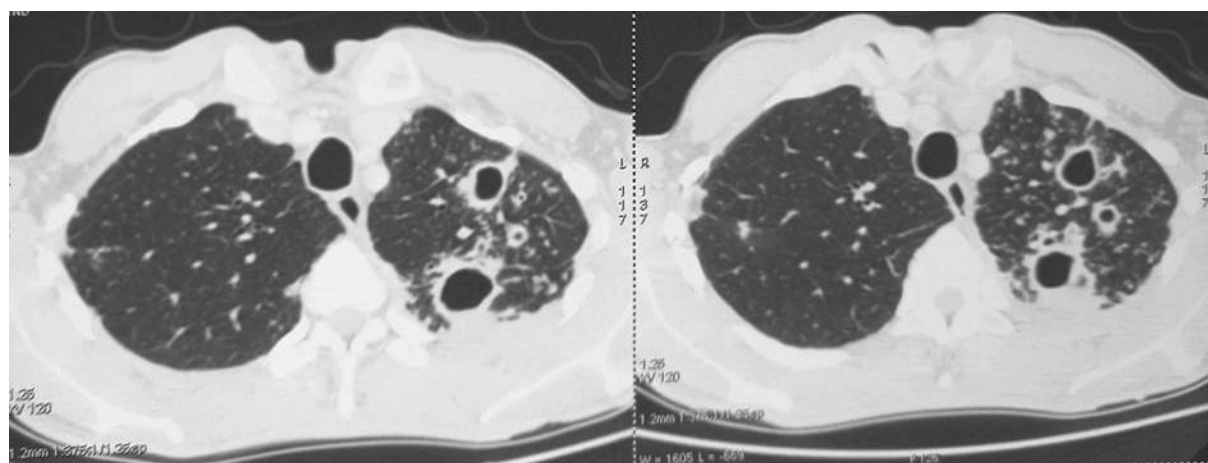


Figure n°1: Axial chest computed tomography scan (lung window) shows left lung micronodules, multiple cavitations and bronchiectasis.

Tuberculin skin test was positive. Sputum smear microscopy identified acid-fast bacilli, after Ziehl-Neelsen staining. HIV infection was eliminated. Polynuclear neutrophil anticytoplasm antibodies were negative. The diagnosis of COVID 19 and pulmonary tuberculosis co-infection was retained. The patient was isolated. Tranexamic acid injections and the Octreotide 500 mg/day in intravenous were administrated to stop the hemoptysis with good outcomes after two days. Because the patient's clinical presentation was not severe and there is no safe or effective treatment for COVID-19, he received only supportive care for it and the treatment for tuberculosis. The patient was started on a standard antituberculosis regimen (rifampicin, pyrazinamide, isoniazid, and ethambutol). He received Zinc, vitamin C and D and prophylactic anticoagulation along after stopping hemoptysis. Oxygen therapy (2-4 l/min via a nasal cannula) was needed during 2 first days of hospitalization.

The course was marked by improvement of his general condition. He continued taking antituberculosis treatment for 6 months at least.

DISCUSSION

The present case report underscores that we should not lose sight of the possibility of co-infection even if the clinical and radiologic presentation could explain the initial diagnosis. The current epidemiological situation in which we find ourselves dictates that COVID-19 testing be performed on anyone who presents with respiratory and non-respiratory symptoms that have been documented to be associated with this infection. However, we should not forget the other infections, such as TB, especially in Tunisia. Little is known about the relationship between COVID-19 and TB. Recent studies have indicated that individuals with either latent or active TB may be more susceptible to infection with COVID-19, and the progression of the disease caused by this virus may be faster and more severe than in patients without TB.^[2] But, this result is conflicting. A cohort of 69 patients showed that TB might not be a major

determinant of mortality.^[6] Co-infection was particularly dangerous for people in conditions of social vulnerability, the elderly and people with other comorbidities. It is important to emphasize that the cohort of young migrants without comorbidities had a milder form of COVID-19 with no deaths.^[6] In our patient, we suggest that TB preceded COVID-19 despite they were simultaneously diagnosed, given the evolving symptoms and multiple cavitations in CT. He presented mild COVID-19 symptoms that can be, also, reported to TB. In the cohort study of 49 patients with COVID 19/TB coinfection and mean age of 48 years, active TB was found in 85.7% of patients.^[5] For COVID-19, 89.2% of patients were symptomatic and presented lung manifestation in 47.7%.^[5] On the other hand, there are still no clear data regarding the influence of COVID-19 on TB progression.^[2] It is supposed that temporary suppression of cellular immunity by COVID-19 could predispose to the development of active TB disease, either directly after exposure to BK or through reactivation of latent TB infection, as occurs in other viral infections, such as measles and HIV.^[7] In a cohort, COVID-19 co-infection in TB patients was found to accelerate the disease course leading to death in a few of them. The mortality rate was up to 11.6% in the cohort of 69 patients.^[6] However, the prognosis of co-infection in long term was not assessed in this study.^[6] In our patient, TB symptoms might be aggravated by immunosuppression caused by COVID-19 infection.

The clinical presentations of the two diseases are quite similar and it may affect the diagnosis. Dry cough, chest tightness, shortness of breath, diarrhea, and fever were described.^[5] Individuals with COVID-19 may exhibit characteristic symptoms of TB, such as hemoptysis, weight loss, and anorexia, as reported in a 19-year-old patient in the United States.^[7,8]

On blood tests, lymphocytopenia and thrombocytopenia are commonly reported.^[5] On CT, ground-glass opacities, consolidations, infiltrates, enlarged mediastinal

lymph nodes and sequelae of previous cavitations lesions have been reported.^[3]

We should be aware of the impact of COVID-19 treatments on TB because they can modulate the immune response and increase medication interaction. Actually, COVID-19 vaccines are introduced into countries and the real-world data on vaccine effectiveness seems promising.^[9]

CONCLUSION

Cases of Co-infection COVID 19 and TB have rarely been reported in current literature, studies have indicated that the isolation of TB cases can be an important measure to minimize the occurrence of severe cases of COVID-19 and associated hospitalizations.^[10] Prospective studies with larger populations are required to elucidate the relationship between the 2 diseases.

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REFERENCES

1. He G, Wu J, Shi J, Dai J, Gamber M, Jiang X, et al. (COVID-19 in tuberculosis patients: A report of three cases). *J Med Virol*, 2020; 92(10): 1802-6.
2. Mousquer GT, Peres A, Fiegenbaum (M. Pathology of TB/COVID-19 Co-Infection: The phantom menace). *Tuberculosis (Edinb)*, 2021; 126: 102020.
3. Martínez Orozco JA, Sánchez Tinajero Á, Becerril Vargas E, Delgado Cueva AI, Reséndiz Escobar H, Vázquez Alcocer E, et al. (COVID-19 and Tuberculosis Coinfection in a 51-Year-Old Taxi Driver in Mexico City). *Am J Case Rep*, 2020; 21.
4. Ben Jmaa M, Ben Ayed H, Koubaa M, Hammemi F, Trigui M, Ben Hmida M, et al. (The ongoing challenge of Pulmonary Tuberculosis in Southern Tunisia: A review of a 22-year period). *Respir Med Res*, 2020; 77: 67-71.
5. Tadolini M, Codecasa LR, García-García J-M, Blanc F-X, Borisov S, Alffenaar J-W, et al. (Active tuberculosis, sequelae and COVID-19 co-infection: first cohort of 49 cases). *Eur Respir J*, 2020; 56(1): 2001398.
6. Motta I, Centis R, D'Ambrosio L, García-García J-M, Goletti D, Gualano G, et al. (Tuberculosis, COVID-19 and migrants: Preliminary analysis of deaths occurring in 69 patients from two cohorts). *Pulmonology*, 2020; 26(4): 233-40.
7. Low JGH, Lee CC, Leo YS, Guek-Hong Low J, Lee C-C, Leo Y-S. (Severe Acute Respiratory Syndrome and Pulmonary Tuberculosis). *Clinical Infectious Diseases*, 2004; 38(12): e123-5.
8. Akbar H, Kahloon R, Akbar S, Kahloon (A. Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) Infection Mimicking as Pulmonary Tuberculosis in an Inmate). *Cureus*, 2020; 12(6): e8464.
9. Mahase E. (Covid-19: Israel sees new infections plummet following vaccinations). *BMJ*, 2021; n338.
10. Pinheiro DO, Pessoa MSL, Lima CFC, Holanda JLB. (Tuberculosis and coronavirus disease 2019 coinfection). *Rev Soc Bras Med Trop*, 2020; 53: e20200671.