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Lessons from the Covid-19 Global Health Response to Aid in the Detection of Tuberculosis Cases: Case on Covid -19 and Tuberculosis Coinfection

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A B S T R A C T

Coronavirus disease 2019 (COVID-19), caused by a novel beta-coronavirus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has spread worldwide since December 2019, causing significant global public health and economic problems. A 56-year-old female patient presented to the emergency department with a history of shortness of breath for 1 week (SpO2 97%), fever for the last 3 days. Associated with ulcers in the mouth. She had COVID 19 infection 3 months back confirmed by PCR, but no hospital admission was required, A second COVID infection caused her to be hospitalized, she was treated according to guidelines National Guidelines for Clinical Management and Treatment of COVID-19. Remdesivir and dexamethasone were given, followed by ceftriaxone as she spiked a fever and her procalcitonin level increase. Partial clearing of bilateral air space shadowing and consolidations, the speculated lung base mass seen in the right lobe, favoring early resolution. No demonstrable pneumothorax. Sputum culture reports revealed heavy growth of pseudomonas aeruginosa, Stenotrophomonas maltophilia. In addition, moderate growth of Enterobacter-cloacae with multiple drug resistance organisms (MDRO). Remained febrile without hypoxemia and prolonged positive PCR, then TB suspected induced sputum was positive for AFB. Treatment with anti-tuberculosis medication HRZE+ Pyridoxine was given to the patient, whose condition was stabilized and he was discharged, but Isolation home quarantine was advised.

INTRODUCTION

A new global public health and economic crisis have been caused by Coronavirus disease 2019 (COVID-19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has spread worldwide since December 2019. The World Health Organization declared COVID-19 on March 11, 2020. The COVID-19 virus has been associated with over 74 million cases and over 1.68 million deaths as of December 19, 2020. Nearly half of these cases were associated with four COVID-19 high-burden countries, including the United States (23.1%), India (13.2%), Brazil (9.5%), and Russia (7.5%) [1].

COVID-19's early signs and symptoms are comparable to those of other respiratory diseases like tuberculosis (TB) and influenza. Coinfections with common viral, bacterial, and fungal pathogens are widespread among COVID-19 patients, which might complicate COVID-19 diagnosis and therapy. For many years prior to the COVID-19 outbreak, tuberculosis had been the world's most lethal infectious disease [6]. There are just about 100 persons living with tuberculosis in the United Arab Emirates, and there were no TB-related deaths reported last year. Human, financial, and other resources have been diverted from the fight against tuberculosis to the COVID-19 response in many countries, limiting access to crucial services. The COVID-19 pandemic in 2020 will disrupt a variety of services, but the impact on TB has been particularly severe. In 2020, for example, 1.5 million individuals will have died from tuberculosis.

The increase in TB fatalities was primarily seen in the 30 nations with the greatest TB burden. According to WHO modeling, the number of persons contracting tuberculosis and dying from the disease in 2021 and 2022 could be significantly greater [7].

Due to difficulties in providing and obtaining basic TB services, many persons with TB will not be diagnosed in 2020. The number of new cases of tuberculosis diagnosed and reported to national governments decreased from 7.1 million in 2019 to 5.8 million in 2020. In the face of the global COVID-19 pandemic, other epidemiological issues that are important to public health have been ignored, and the diagnosis of many serious infectious diseases, including tuberculosis, is insufficient. In addition, it is unclear whether patients with COVID-TB have a worse prognosis or are more likely to develop a serious disease [8].

CASE REPORT

A 56-year-old female patient reported to the ER with a one-week history of shortness of breath (SpO_2 97%) and a three-day fever (38.2). There is no noteworthy past medical history, other than the excision of the appendix ten years ago. G5 P3 L3 A2. A Still have regular periods despite not having reached menopause. She had COVID 19 infection three months ago, which was verified by PCR, but no hospitalization was required; at the time, all of her family members were sick, but this time, none of them exhibit any symptoms or have been exposed. She was not vaccinated and had just returned from India. She was treated according to the National Guidelines for Clinical Management and Treatment of COVID-19 when she was admitted. For spiking a fever and an elevation in her procalcitonin (1.64) level, Remdesivir and dexamethasone were given, followed by ceftriaxone1gm BID and piperacillin-tazobactam 4.5 gm QID for 5 days. She was receiving 2 liters of oxygen via nasal cannula during Spo2 90%. The first-day

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chest X-ray examination revealed increased haziness in the middle and lower zones bilaterally, but no significant pleural effusion. Only colistin is sensitive to pseudomonas aeruginosa, according to sputum culture data, which also demonstrated strong growth of pseudomonas aeruginosa and moderate development of enterobacter-cloacae with multiple drug resistance organisms (MDRO) (Table 1). Colistin 1 MIU nebulization and sulfamethoxazole-trimethoprim 800/160mg BID were started for 7 days. CT On the tenth day of hospitalization, a chest examination revealed a right upper-suspected lung mass. On CT abdominal evaluation, bilateral complicated adnexal cystic mass lesions were discovered.

After finishing the colistin nebulization course, the procalcitonin and CRP levels continued to rise, indicating that the secondary infection was still present. A 4.5 MIU colistin high dose was started with renal function monitoring. When compared to prior chest examinations, the upper lobe has grown in size, containing a tiny area of central liquefaction surrounded by ground-glass opacities, and now clearly bordered inferiorly by an oblique fissure. (Current dimensions: 40 x 31 x 24 mm) (Old measurement 20 X 17 X 11 mm). A modest patch of opacity with surrounding reticular shadows can also be noticed in the RT's posterior section. The top lobe of bilateral minor pleural effusion measures around 10 x 10 x 10 mm (Figure 1).

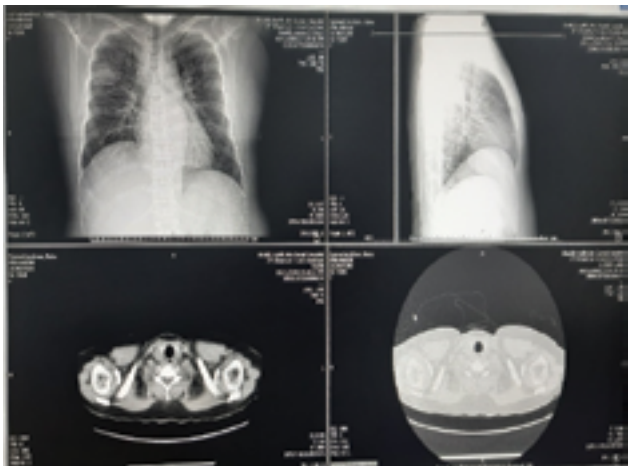

Figure 1: Chest X-ray.

Following a stool inspection, C. Diff Toxin assay was positive, vancomycin 500 mg oral solution was administered Q8 hr for 5 days. On sputum culture examination, moderate growth of Candida albicans was found. Caspofungin was given at a starting dose of 70 mg, followed by a maintenance dose of 50 mg for 14 days. After remaining febrile without hypoxemia and a lengthy PCR, a later culture revealed Pseudomonas and CT scan consolidations, leading to the diagnosis of tuberculosis. Sputum AFB tests were negative for several days until provoked sputum revealed 2+ AFB. Anti-tuberculous treatment HRZE+ pyridoxine daily regimen was started on the same day. The patient's condition is currently stable, and he is taking anti-TB medicine. The patient was discharged, and the infection control department recommended that they follow up with internal medicine within a month.

P***seudomonas aerugeinosa***	**Susceptibilities**
Amikacin	R
Cefepime	R
Ceftazidime	R
Ciprofloxacin	R
Colistin	S
Gentamicin	R
Meropenem	R
Piperacillin/Tazobactam	R
Ticarcillin	R
Ticarcillin/Clavulanate	R
Tobramycin	R
ENTEROBACTER-CLOACAE	
Amikacin	S
Amoxicillin/Clavulanate	R
Cafalotin	R
Cefepime	S
Cefoxitin	R
Ceftazidime	S
Ceftriaxone	S
Ciprofloxacin	S
Gentamicin	S
STENOTROPHOMONAS MALLOPHILIA	
Trimethoprim/Sulfamethoxazole	S
Candida albicans	
Amphotericin B	S
Caspofungin	S
Fluconazole	S
Voriconazole	S
Micafungin	S
Flucytosine	S

Table 1: Sputum Culture Susceptibilities.

DISCUSSION

Fever, cough, dyspnea, weight loss, tiredness, and expectoration are the most common clinical symptoms of COVID-TB. The most common CT findings of COVID-TB are bilateral lesions, cavities, infiltrates, ground-glass opacity, nodules, pleural effusion, and fibrosis, according to existing evidence, whereas the most common CT findings of COVID-19 patients are bilateral lesions, cavities, infiltrates, ground-glass opacity, nodules, pleural effusion, and fibrosis. Instead of focusing on one disease, doctors should consider COVID-TB coinfection when seeing the above CT imaging characteristics in the future. Dyspnea and CT abnormalities such as bilateral lesions infiltrate, and tree in bud was found to be more common among COVID-TB patients who died, suggesting that they may be good predictors of disease severity, according to earlier research. According to Wan-mei Song study shows that There were 36 studies in total. 19 (23.46 percent) of the 89 COVID-TB patients died, and 72 (80.90 percent) were male. Treatment included anti-TB therapy, antibiotics, antiviral therapy, hydroxychloroquine, and corticosteroids, with 88.52% receiving anti-TB therapy, 50.82% receiving antibiotics, 22.95% receiving antiviral therapy, 26.23 percent receiving hydroxychloroquine, and 11.48% receiving corticosteroids. In the COVID-TB group and the non-TB group, the pooled ORs of death or severe illness were 2.21 (95 percent CI: 1.80, 2.70) and 2.77 (95 percent CI: 1.33, 5.74) (P 0.01), respectively [1]. According to Sulaiman lakh study, the COVID-19 pandemic negatively impacted TB care delivery at the largest treatment center in Sierra Leone, with fewer presumptive cases referred to testing in 2020 compared to 2019. Notwithstanding, treatment success rates were higher in 2020. Among others, self-administration of anti-TB drugs independently predicted treatment success, a finding that may have policy implications for TB control efforts in this high burden country [3]. As per ML Aznar, the study shows that the COVID-19 pandemic has caused substantial changes in TB care. TB patients diagnosed during the COVID-19 pandemic showed more extended pulmonary forms. The increase in LTBI infection and active TB in children who were household contacts of patients reflects increased household transmission due to anti-COVID-19 measures [4]. COVID-19 has a negative influence on people who have tuberculosis and influenza illnesses at the same time. COVID-19 individuals with HIV or chronic hepatitis have similar clinical outcomes to COVID-19 patients without these illnesses as per Soumya Sarkar's study. During January-February 2020, coronavirus disease (COVID-19) and tuberculosis were diagnosed for 3 patients in Wuhan, China. All 3 patients had COVID-19 pneumonia. One severely ill patient died after acute respiratory distress syndrome developed [5]. Clinicians and public health officials should be aware of underlying chronic infections such as tuberculosis in COVID-19 patients.

CONCLUSION

In conclusion, bilateral lesions, infiltrates, tree in bud, and a higher leucocyte count on CT imaging may be predictors of poor prognosis in COVID-TB patients. Furthermore, research suggests that patients with COVID-TB are three times more likely to die or acquire the severe disease, according to a moderate level of evidence. Due to the identical and non-specific clinical presentations of COVID-19 patients, additional diagnosis and investigations of TB co-infection should be conducted on admission for all patients diagnosed with COVID-19. Finally, due to the worse prognosis of COVID-19 and the confounding clinical signs of these two diseases, routine screening for Mycobacterium tuberculosis is advised among suspected or confirmed cases of COVID-19 in high–TB burden countries.

The current case will serve as a significant source of knowledge for the management of two simultaneous illnesses in many regions around the world, given the scarcity of literature. In the current epidemic, doctors should have a high index of suspicion and consider testing patients for both TB and COVID-19.

ABBREVIATIONS

AFB: Acid-fast bacillus

TB: Tuberculosis

PCR: Polymerase chain reaction

HRZE: Isoniazid, rifampicin, pyrazinamide and ethambutol

LTBI: Latent tuberculosis infection

MDRO: Multiple drug resistance organisms

CONFLICT OF INTERESTS

No conflict of interests.

ETHICAL CONSIDERATION

None

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None

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