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Case Study

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A CASE REPORT OF POST COVID PNEUMOTHORAX SUPERADDED WITH TUBERCULOSIS

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ABSTRACT

Covid-19 is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). It affects the lungs and symptoms are fever, cough and shortness of breath. Pneumothorax and tuberculosis can complicate COVID 19 requiring hospital admissions. Here we present a case report of post covid pneumothorax superadded with tuberculosis.

KEYWORDS: Pneumothorax, tuberculosis, covid 19.

INTRODUCTION

COVID 19 pandemic has affected the lives world wide. It is caused by highly contagious SARS-CoV-2 virus which has strong prediliction to respiratory system. It is a single stranded RNA virus. It started in December 2019 in Wuhan, China and the virus was first identified on Jan 6, 2020.[1] The common symptoms include cough, dyspnea, fever, diarrhea, malaise, myalgia, sore throat, anosmia, dysgeusia. It is diagnosed by nasopharyngeal swab tested by RT-PCR. Chest radiography shows bilateral peripheral lung involvement mostly at the lung bases. CT has characteristic features of ground glass haze. As the disease progresses it can lead to other complications such as pneumonia, pleural effusions, subcutaneous emphysema, pericardial effusions, lung cavitation and pneumothorax.

Pneumothorax is reported in many cases after COVID 19 requiring hospital admissions.In these cases, the development of the pneumothrax was preceded by significant pulmonary symptoms and chest imaging changes. Among these sequeals immunosuppression is also common which leads to severe opportunistic infections. Tuberculosis is endemic in india and most common opportunistic infection so far. We here present a case of pneumothorax after having recovered from COVID 19 viral pneumonitis and on further investigations patient was diagnosed with pulmonary tuberculosis.

CASE PRESENTATION

A 23 years old female presented with the complaints of right sided chest pain and breathlessness for the last 6 hours. Before 21 days she suffered from fever, breathlessness, cough and malaise. So she was tested for covid 19 and came out to be positive on RT-PCR. She was then isolated in isolation ward and after 16 days from onset of symptoms, the RT-PCR was negative for COVID 19 infection. The patient was kept just on simple oxygen mask without the use of mechanical ventilation and supportive medications along with steroids. She had a history of pulmonary tuberculosis two years ago. She had no past history of diabetes mellitus, hypertension and bronchial asthma. There was no relevant family history of tuberculosis and no smoking and past surgical history.

On examination, patient was in discomfort, cyanosed, febrile, and there was decreased air entry on right side of chest with hyper resonant note on percussion. The blood pressure was 116/80,heart rate was 99 beats/min,oral temperature was 99.5 degree fahrenheit, Oxygen saturation was 85% and respiratory rate was 25 breaths/min. We send her for basic blood investigation and chest radiograph.

The blood investigation results were hemoglobin 9g/dl(normal value 12-16g/dl), WBC count 10, 200/ul(normal value 4000-11000/ul), lymphocyte 1060/ul(normal value1090-2990/ul), platelet counts 280000/ul(normal value 150000-450000/ul), blood urea 18.39mg/dl(normal value 15-45mg/dl), serum creatinine

0.22 mg/dl(normal value 0.57-1.25mg/dl) and blood sugar 104 mg/dl(normal value 70-120 mg/dl). The chest radiograph shows hyper-lucency of right hemithorax as seen below in Figure 1,so the diagnosis of pneumothorax was confirmed.

A right sided intercostal chest drain was inserted under local anaesthesia and aseptic technique. Then the patient gradually improved. She was kept on oxygen, and was treated with paracetamol injection 1 gm thrice daily, with ceftriaxone injection twice daily. The next day patient was sent for a new chest radiograph that shows expanded right lung with parenchymal shadows as seen in Figure 2 and basic blood investigations that were normal. In the 5th postoperative day, the patient was again sent for the chest radiography which revelaed fully expanded lung and it also showed single thick walled cavity in the right middle zone with surrounded by heterogenous opacity in both right middle and lower zones. Contralateral lung parenchymal involvement was also present which can attributed by the presence of infiltration present in left middle and lower zones. Now, the patient was complaining of cough with expectoration and fever. So she was tested for sputum for AFB which came out to be 2+ and sputum for CBNAAT was positive for 'R' sensitive mycobacterium tuberculosis. Therefore, she was started on anti- tubercular therapy and was monitored accordingly. Further she was put to follow up.

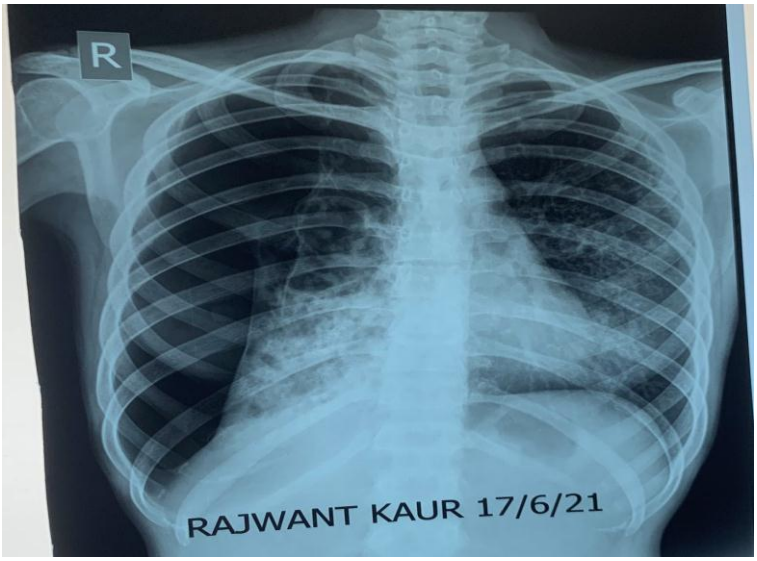

Figure 1:

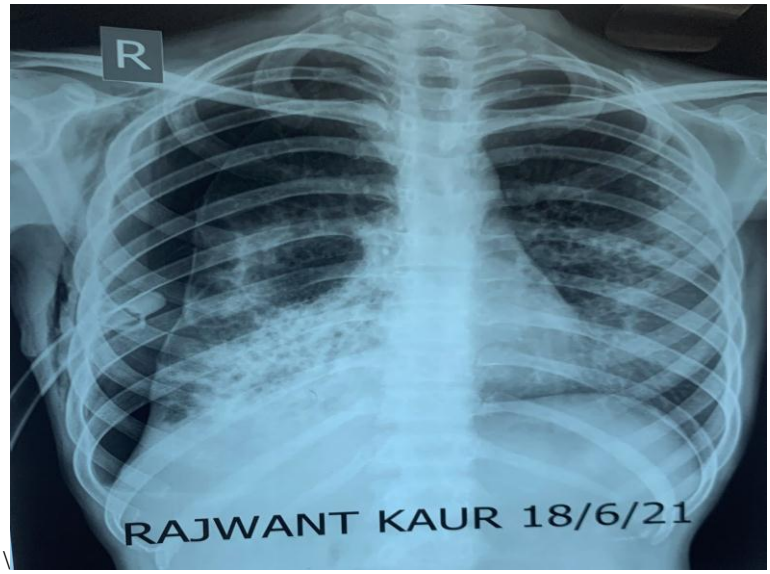

Figure 2:

DISCUSSION

A pneumothorax is defined as air in the pleural space. It can be classified as spontaneous (primary or secondary) or traumatic. Primary spontaneous pneumothorax (PSP) however, by definition, occurs in patients with no underlying lung disease. Indeed, a finding of abnormal pleura however is very common even in PSP patients if looked for carefully, and include blebs and bullae, which are otherwise known as emphysema-like changes.[2]

Secondary spontaneous pneumothorax (SSP) occurs due to an underlying lung disease while traumatic pneumothorax can result from trauma including iatrogenic cases caused during procedures, for example, as a complication of central venous catheter placement.

A literature search for spontaneous pneumothorax in COVID-19 yielded 25 cases. These cases include a 37-year-old man without medical history who was hospitalized for COVID-19 pneumonia and acute hypoxaemic respiratory failure requiring high-flow nasal cannula, then developed a right-sided pneumothorax requiring chest tube placement 2 weeks after disease onset and 2 days after discharge from the hospital.[3] A 38-year-old man developed cystic pulmonary lesions and a small left pneumothorax 32 days after disease onset; he received oxygen only at a low flow of 5 L/min.[4] Explaining the relationship between pneu- mothorax and Covid-19 is challenging with multiple possible mechanisms underlying this relationship. Pneumatoceles or cysts in patients with COVID-19 are described in the literature, even in patients not requiring positive pressure ventilation. This means that barotrauma associated with positive pressure ventilation alone cannot account for the cyst formation, which may contribute to the likelihood of developing a secondary pneumothorax.[5-7] Our case agrees with the hypothesis as our case is not mechanically ventilated ruling out barotraumas as the possible cause. Other possible causative factors for a pneumothorax in COVID-19 may be persistent coughing resulting in an increased intrathoracic pressure in the presence of underlying pleural abnormalities or alveolar damage from COVID-19 pneumonia related inflammation or ischaemic parenchymal damage.[8]

The spread of COVID-19 in countries that have a high burden of other diseases like TB could have a devastating effect on already crumbling health facilities in these low and middle-income countries. Also, as reported in the past such pandemics can result in a tendency to overlook other endemic diseases, such as TB.[9] The disease like TB is of a common occurrence especially in the high burden countries.[10] Viral respiratory infections and TB impair the host's immune responses. TB status might play a role in the development of COVID-19 infection and exacerbation of the course of the disease for the co-infected population consider-ing cases studied in China and India.[11] Also, the use of immunosuppressive drugs in severe and critical COVID-19 patients, although done for a lim- ited period of time, may result in increased likelihood of active TB caused by reactivation or new infection of *M. tuberculosis.*[12,13]

Pneumothorax may be increased in cases of COVID 19 infection, although not established, could be due to damage predominantly to the subpleural alveoli, leading to spontaneous alveolar rupture into the pleural space. Other potential mechanisms of injury include increased intrathoracic pressure due to frequent coughing.

CONCLUSION

Coronavirus disease 2019 may get complicated with pneumothorax and tuberculosis. Pneumothorax can develop in COVID 19 pneumonia due to multiple plausible mechanisms. These include parenchymal injury, inflammation, ischaemia, infarction, cough and pneumatocele rupture and development of tuberculosis may be attributed to host's immune system. COVID-19 causes a spectrum of host immunological responses with asymptomatic individuals to severe cytokine storm events that may be fatal. Immunosuppression including steroids used to treat COVID-19 may in future result in TB reactivation. However, in the above presented case, patient developed acute dyspnea due to underlying pneumothorax which can be a post covid 19 complication as our patient had constant complaint of cough and moreover she had already diseased lung. As in chest radiograph a thick walled cavity lying in right middle zone can be visualized attributing to a chronic granulomatous infection which is validated by a positive history of pulmonary tuberculosis. Moreover, when the lung expanded after chest tube insertion again cavity in the right middle zone can be seen. Therefore, association between the post covid immunosuppression and endemic diseases like tuberculosis can be strongly made. However, more evidence is required to understand the potential of COVID-19 to favor reactivation of an existing TB infection.

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