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Case Report

Coinfection with SARS-CoV-2 and parainfluenza virus in an elderly patient: a case report

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ABSTRACT

COVID-19 was declared a pandemic by the WHO on 11th March 2020. Influenza usually occurs in winters, and the burden of the disease is determined by several factors, including the effectiveness of the vaccine that season, the characteristics of the circulating viruses, and how long the season lasts. Host factors and comorbidities also play an integral role in determining the outcome of the disease. Both the viral diseases present with an acute influenza like illness which may progress in certain individuals to Acute Respiratory Distress Syndrome. It is essential to understand that coinfection with viruses may occur and it is important to diagnose them as some require antivirals and some supportive and symptomatic management. Here, we present the case of an elderly lady with bilateral bronchiectasis who was infected with both SARS-CoV2 virus and parainfluenza 3.

Keywords: COVID-19, SARS -CoV-2, Biofire, H1N1, Parainfluenza, ALI, ARDS

INTRODUCTION

Since December, 2019, coronavirus disease 2019 (COVID-19) has been an international public health emergency. There are a lot of similarities with regards to the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and the influenza virus in terms of the transmission, clinico radiological features and seasonal coincidence. Thus, co-infection by both viruses is feasible.[1]

As of June 07, 2023, the COVID-19 pandemic had caused 767.7 million infections and 6.9 million deaths worldwide. Although the World Health Organization declared the end of the pandemic emergency on May 05, 2023, endemics remain possible as the virus continues to undergo genetic mutations. SARS-CoV-2 is likely to coexist with humans for a long time, similar to the influenza virus.

COVID-19 and influenza may spread simultaneously in the population. Influenza caused 3-22 million hospitalizations and 99,000-200,000 deaths worldwide in 2017.

During the early period of the COVID-19 pandemic, non-pharmaceutical interventions (NPIs) were effective in controlling the spread of influenza. As NPIs were withdrawn, influenza epidemic trends gradually increased. Sharing the same transmission pathway, SARS-CoV-2 and influenza may form a co-pandemic in the population. One recent meta-analysis indicated that overall 1.2% of COVID-19 patients had influenza co-infection.[2] Our patient presented with concurrent COVID-19 and parainfluenza infections with a background history of bilateral bronchiectasis/ DM, hence emphasising on the need for early detection to improve clinical outcome.

CASE REPORT

73 year old lady, presented in the hospital's EMD with increased dyspnoea since 2 days with high grade fever and rhinitis. She was a known case of DM, bronchiectasis for which she was on inhalers and long term oxygen therapy at home.

Physical examination revealed Respiratory rate of 28 breaths/minute and SPO2 was 68% on room air, pulse rate 111/minute and Temperature of 98.6oF. On chest examination, bilateral rhonchi with coarse crepitations were present. Other systems examination did not reveal anything. Blood investigations including hemogram, LFT, RFT were within normal limits. Chest X Ray (Figure 1) revealed increased bronchovascular markings with bilateral lower zone patchy opacities. As patient was having fever, respiratory panel BIOFIRE for viruses and bacteria was sent by taking a nasopharyngeal swab and that dectected SARS CoV-2 and Parainfluenza virus 3 (Table 1). Patient required ICU admission for high flow oxygen and other supportive management.

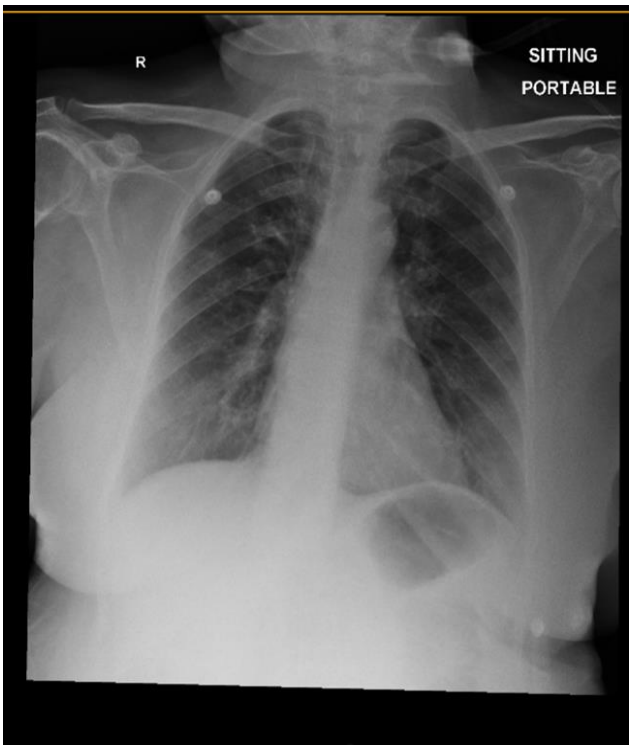

Figure 1: A chest radiograph showed increased bronchovascular markings and bilateral lower zone patchy opacities.

She was treated with injectable Cefaperazone+ Sulbactum (1.5 g every 12 hours), and by Oseltamivir (5 days: 75mg twice/day) for parainfluenza infection. In addition, she also required systemic steroids and low molecular weight heparin (LMWH) for high D dimer levels. She responded well to treatment and was shifted out of the ICU in 4 days. She had an uneventful stay in the ward and was discharged after a total hospital stay of 8 days. Patient came a month later to the OPD and is doing well.

Table 1: The result of respiratory panel tests showing detection of parainfluenza Virus 3.

Respiratory panel-biofire	
Viruses	
Adenovirus	Not detected
Coronavirus 229E	Not detected
Coronavirus HKU1	Not detected
Coronavirus NL63	Not detected
Coronavirus OC43	Not detected
Middle east respiratory syndrome coronavirus (MERS-CoV)	Not detected
Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)	Detected
Human metapneumovirus	Not detected
Human rhinovirus/enterovirus	Not detected
Influenza A	Not detected
Influenza A/H1	Not detected
Influenza A/H3	Not detected
Influenza A/H1-2009	Not detected
Influenza B	Not detected
Parainfluenza virus 1	Not detected
Parainfluenza virus 2	Not detected
Parainfluenza virus 3	Detected
Parainfluenza virus 4	Not detected
Respiratory syncytial virus	Not detected
Bacteria	
Bordetella pertussis	Not detected
Bordetella parapertussis	Not detected
Chlamydia pneumoniae	Not detected
Mycoplasma pneumoniae	Not detected

DISCUSSION

Coinfection with both influenza and SARS-CoV-2 is a concerning scenario as it could potentially lead to more severe respiratory illness. Both influenza and COVID-19 primarily affect the respiratory system, causing symptoms such as fever, cough, and breathing difficulty.[3] The present case is radiography confirmed pneumonia patient with co-infection of SARS-CoV-2 and parainfluenza virus 3. This case underscores the difficulties in differentiating COVID-19 from other upper respiratory tract infections (URTIs) such as influenza, adenovirus, respiratory syncytial virus etc., in the initial stages. Patient was found to be positive for SARS COV2 and Parainfluenza 3 via panel tests on the day of presentation and treatment thus initiated helped in optimising patient management.

The overlap in symptoms between COVID-19 and influenza makes accurate diagnosis crucial, involving molecular tests to identify both viruses. Patients with co-infections may experience more severe illness, leading to increased strain on ICU resources and healthcare

professionals.[4] In the present case, after the admission of the patient with correct diagnosis, patient was treated with antiviral therapy by indirect-acting antiviral agent.

Different studies have reported co-infection with SARS-CoV-2 and influenza viruses (A or B). According to a systematic review and meta-analysis of 3070 COVID-19 patients and 79 patients with concurrent COVID-19 and Influenza infections, the frequency of influenza virus co-infection among patients with COVID-19 was 4.5% and the prevalence of influenza infection was 0.8% in patients confirmed with COVID-19.[5]

The overall mortality of COVID-19 patients who had influenza co-infection was 1.2%. One other meta-analysis study revealed that co-infection with SARS-CoV-2 and influenza showed a high heterogeneity for overall mortality.[6]

In brief, our case indicates that COVID-19 could be overlooked due to simultaneous infection with other respiratory viruses and vice versa. Comprehensive viral testing may be essential for accurate early-stage pneumonia diagnosis to prevent delays in treatment. Currently, there is insufficient evidence regarding the appropriate management of such patients. The presence of comorbidities and concurrent infections often complicates the clinical picture, especially in older individuals who experience the most severe COVID-19 outcomes.

Previous analysis found that while the occurrence of both influenza and COVID-19 in patients is rare, those who are coinfected face a heightened risk of severe illness. Managing SARS-CoV-2 and influenza infections in comorbid patients within hospital settings requires a nuanced and collaborative approach. Additionally, tailored treatment plans should be established to effectively manage coinfected individuals and minimize the likelihood of severe outcomes.[7]

CONCLUSION

To prepare for potential future co-epidemics, it's crucial to improve surveillance and detection methods for both viruses to promptly identify and diagnose coinfections. Furthermore, increasing the uptake of vaccines for both COVID-19 and influenza among vulnerable groups can help prevent coinfection.

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