

Clinical misdiagnosis of influenza infection with a confusing clinical course: A case report

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Abstract

Influenza A infection can mimic coronavirus disease 2019 (COVID-19) in case of their signs and symptoms, making it almost impossible to distinguish them clinically, necessitating using high-precision assays in such patients. Clinicians should be careful in treating such patients merely based on their unspecific manifestations.

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Abstract

Influenza A infection can mimic coronavirus disease 2019 (COVID-19) in case of their signs and symptoms, making it almost impossible to distinguish them clinically, necessitating using high-precision assays in such patients. Clinicians should be careful in treating such patients merely based on their unspecific manifestations.

Keywords: Influenza, COVID-19, Case report, H1N1

Key Clinical Message: Considering the remarkable similarity between the symptoms of COVID-19 and influenza, clinicians should carefully examine patients during the flu season. The similarity of the symptoms should not interfere with getting them the proper treatment.

Introduction

Influenza A virus (IAV) is a single-stranded RNA virus of the Orthomyxoviridae family that causes influenza A disease [1]. Influenza A is an acute viral disease with a high epidemic that can occur with mild to severe symptoms, with its first effects can be seen in the respiratory system [2]. Influenza was first seen in 1918, killing 50 to 100 million people in the first year of the pandemic [3]. A strain called H1N1 first caused a pandemic worldwide in 2009 in California, North America, killing 100,000 to 400,000 people [2, 4]. On June 11, 2011, the World Health Organization (WHO) declared H1N1 influenza, a seasonal swine flu virus, a global pandemic [5].

Due to its contagiousness, this disease can also cause diseases such as pneumonia and bronchitis in children; 10% of hospitalized patients and 3% of deaths caused by this disease are children under 18 years [4]. This disease can be transmitted from one person to another through exposure to contaminated surfaces or large contaminated respiratory droplets [6]. Symptoms of the disease appear one week after exposure to the virus and can include headache, cough, sore throat, myalgia, fatigue, runny nose, fever, shortness of breath, diarrhea, and vomiting. Among the complications of this disease, we can mention bacterial infections, respiratory failure, myocarditis, rapidly progressive disease of the lower respiratory system, neurological complications, and acute respiratory distress syndrome (ARDS) with resistant hypoxemia. This disease can also be caused by worsening the underlying disease [6].

Coronavirus disease 2019 (COVID-19) is a viral disease that was first reported in 2019 and became a global pandemic. This disease is similar to influenza because of its respiratory symptoms and complications [7]. This report examines a patient with influenza A H1N1 with similar symptoms to COVID-19.

Case Presentation

A 32-year-old woman with a history of hypothyroidism and major depressive disorder (MDD) was admitted to the infectious disease ward. Her symptoms began three days ago with fever, chills, loss of appetite, myalgia, and dry coughs, which gradually became productive. Her fever got under control with medical therapy. Then, she presented with vomiting and watery secretory diarrhea. Also, according to the patient's family, she had an episode of bloody diarrhea, followed by hypotension and tachycardia, before her admission. Finally, she was referred to the hospital with severe weakness and decreased level of consciousness. Her body temperature was 37°C, blood pressure was 77/42 mmHg, heart rate was 136 beats/minute, and respiratory rate was 20 breaths/minute. On physical examination, she had evidence of severe dehydration. The patient's drug history included biperiden and perphenazine.

At the beginning of hospitalization, the patient underwent fluid therapy, but her clinical manifestations deteriorated. Due to tachycardia, an echocardiography was performed for the patient, which was normal. Tests were performed for the patient, as shown in Table 1. Due to her resistant hypotension to hydration, the patient was treated with a vasopressor. Although her creatinine was in the normal range (0.8 mg/dL, normal range: 0.6-1.1 mg/dL), the patient's urine volume was low, and its color was extremely dark. Then, an arterial blood gas analysis was requested for the patient, in which her pH was 7.16 (normal range: 7.35-7.45). Therefore, the patient was treated with sodium bicarbonate. Moreover, the patient was admitted to the intensive care unit (ICU) due to the lack of improvement in symptoms. In the ICU, the patient was diagnosed with refractory septic shock and treated with broad-spectrum antibiotics, including vancomycin, meropenem, and corticosteroids prescribed for resistant hypotension, alleviating her symptoms and improving her general condition. After the patient regained consciousness and the color of her urine became normal, corticosteroids and vasopressors were discontinued. The patient was requested a high-resolution computed tomography (HRCT) scan due to frequent cough, in which a patchy ground glass appearance with interlobular septal thickening was observed. The next day on her second HRCT, consolidation in the posteromedial of inferior lobes was observed.

Based on the acquired data, the differential diagnosis included gastroenteritis, drug or food poisoning, and viral pneumonia. First, with the suspicion of drug poisoning, a urine drug screening was requested for the patient, which was normal. A complete abdomen and pelvis ultrasound was requested, which was also to rule out gastroenteritis. With suspected COVID-19, reverse transcription polymerase chain reaction (RT-PCR) was requested for acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and D-dimer. RT-PCR was negative, and D-dimer was normal (566.3 ng/mL). Then, due to the beginning of the influenza season, RT-PCR for some influenza viruses was requested, which was positive for IAV subtype H1N1.

According to the diagnosis of IAV subtype H1N1, the patient has been treated with oseltamivir capsules 75 mg twice daily for seven days. Finally, she was discharged with improved clinical symptoms and two negative RT-PCR tests for H1N1.

Discussion

The H1N1 IAV was first confirmed in Mexico in 2009. This disease has several complications, the most important of which are respiratory complications, such as ARDS [8]. In 2019, the SARS-CoV-2 virus was reported to be similar to the H₁N₁ influenza virus in many aspects. COVID-19 could exert harmful effects on most body organs, the most important of which are respiratory complications, such as severe pneumonia and ARDS [8, 9]. This case report examines the clinical similarities and differences between COVID-19 and influenza.

Comparing the age groups of patients with both diseases in previous studies showed that more than 73% of patients with COVID-19 were over 40 years old, while more than 40% of patients with H₁N₁ influenza were in the age group of 10 to 18 years [10]. Moreover, most of the COVID-19 patients were male [9]. Our patient was a 32-year-old woman. COVID-19 usually has a more extended incubation period, between 2 and 14 days, while the maximum incubation period of influenza is reported to be seven days [10]. In our patient, symptoms appeared within 2-3 days. The exact initial manifestations of both diseases, such as fever, cough, sore throat, fatigue, myalgia, runny nose, headache, and digestive problems, are present [10]. Initial symptoms of fever, cough, myalgia, diarrhea, and vomiting were observed in our patient. The results of laboratory tests show lymphopenia in both diseases, with the difference that the proportion of lymphocytes in patients with COVID-19 is higher than in patients with influenza [11]. Our patient's lymphocyte count was around 17% during hospitalization.

Studies have shown that both diseases can cause the patient to be hospitalized in the ICU. Still, due to the more severe complications of COVID-19, the affected patients are hospitalized longer in the ICU. In most cases, they may require mechanical ventilation [12]. Our patient was transferred to the ICU a few days after hospitalization due to a lack of improvement but did not require mechanical ventilation. In comparing radiographic findings, both diseases have a vitreous opacity, which could be observed bilaterally in the lower lobes in COVID-19. Influenza involves all the lobes and is observed more diffusely [13]. In our patient, vitreous opacity was observed in a scattered form in all lobes. The RT-PCR test can be the gold standard for diagnosing both diseases [14]. We also requested RT-PCR to confirm the patient's diagnosis, which was negative for COVID-19 and positive for the H1N1 influenza virus.

Due to the similar transmission routes in both diseases, similar prevention methods such as washing hands with soap and water, disinfecting surfaces and hands with alcohol, quarantining the sick person in the family, social distancing in the community, and wearing a face mask can be utilized [10]. Moreover, taking into account the virality of both diseases, antiviral treatments, and corticosteroid pulses can be used. Our patient was also treated with oseltamivir for one week.

Conclusion

Considering all of the points made in this report regarding the differences and similarities between COVID-19 and influenza, as well as the fact that the COVID-19 pandemic is not yet over in many countries, clinicians should initially treat patients based on their signs and symptoms before attempting to differentiate between the two diseases using high-precision diagnostic tests, such as RT-PCR.

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Data Availability Statement

The corresponding author's data supporting this study's findings are available upon reasonable request.

Conflict of interest disclosure

All authors have no relevant financial interests to be declared.

Author Contributions

- **AB:** Data collection and writing the manuscript.
- **ZMA:** Data collection and writing the manuscript.
- **MB:** Data collection, helped with manuscript writing, and contributed substantial revisions to the manuscript's content.
- **RH:** Data collection, helped with manuscript writing.
- **SE:** Design of the research study and supervision.

Informed consent

Written informed consent was obtained from the patient to publish the current case report.

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