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Case Report

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A COVID-19 Report of a Hypotensive Young Woman with Unique High C-Reactive Protein and Unexplained Increase in Ferritin and Lactate Dehydrogenase Serum Levels

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ABSTRACT

This case report aims to document the unusual presentation of low blood pressure in a coronavirus disease-19 (COVID-19) patient. A 22-year-old woman with a history of chronic allergic bronchitis, managed with montelukast 10 mg daily, presented to the emergency department with unique low blood pressure (averaging 90/56 mmHg) during and a month after recovering from COVID-19. The patient initially suffered from fever and cough, treated with paracetamol 500 mg as needed, Vitamin C 1000 mg daily, zinc 25 mg daily, and azithromycin 250 mg twice daily. Symptoms of the patient worsened after a week, leading to a chest X-ray that revealed pneumonia. Subsequent laboratory tests showed high C-reactive protein (CRP) levels and increased ferritin. The patient exhibited persistent low blood pressure, averaging 90/56 mmHg during her COVID-19 infection and for a month post-recovery. Laboratory findings included high CRP levels and elevated ferritin. Chest X-ray confirmed pneumonia.

Keywords: Coronavirus disease-19, hypotension, inflammation

INTRODUCTION

The first patients during the Wuhan city outbreak who had coronavirus disease-19 (COVID-19) found that 30% of all patients, in addition to 37% of those with critical disease conditions, had hypertension.[1] Since then, many studies have confirmed the association between the severity of COVID-19 infection and the presence of hypertension.[2,3] However, recent reports confirmed that there is no association between hypertension and severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) or its severity. Hypertension is extremely prevalent in adults and those who are experiencing severe clinical manifestations and complications of COVID-19.[4] Recent reports showed that respiratory decompensated patients had increased blood pressure, possibly due to the viral effect on the renin-angiotensin-aldosterone system by COVID-19 infection.[5]

CASE REPORT

A 22-year-old female was suffering from fever and cough. The patient showed up in the emergency department with a unique low blood pressure during infection, which lasted for a month after recovery (blood pressure was average 90/56mmHg) and unique labs (abnormal lactate dehydrogenase [LDH] and ferritin levels). Ambulatory blood pressure monitoring was used. Previous baseline blood pressure was an average of 115/70 mmHg. Measured on several occasions before the infection.

The patient has a past medical history of chronic allergic bronchitis - she is on montelukast 10 mg once a day as a prophylactic treatment from the month of November till April each year. The patient also takes a Symbicort® inhaler once daily when she has a cough. The patient was not a smoker, nor did she drink alcohol.

The patient started experiencing a cough for 2 days, which she thought was her allergic bronchitis. Then, on the 3rd day, the patient started experiencing a fever above 38°C. Afterward, a Polymerase Chain Reaction test was done, and it was determined that the patient was COVID-19 positive with oxygen saturation 97%. At the beginning of March 2021, the 1st week of COVID-19 infections, the patient was taking paracetamol 500 mg whenever needed, Vitamin C 1,000 mg once a day, zinc 25 mg once a day, and azithromycin 250 mg twice a day. One week later, symptoms became worse, and a chest X-ray was done and showed pneumonia in the lungs, high C-reactive protein (CRP) levels, and an unexplained increase in serum ferritin level in the 2nd week of the course of infection. The laboratory test results of the patient are summarized in Table 1. Computed tomography scan from the 1st week of infection revealed no diagnostic indicators of COVID-19, presenting a seemingly unremarkable medical image that underscores the initial challenges in identifying the viral infection. Thorax computed tomography scan image of the patient is shown in Figure 1. However, the chest X-ray from the 2nd week dramatically illustrates the rapid progression of the disease, displaying evident radiographic changes consistent with COVID-19-related pneumonia. Chest X-ray of the patient is shown in Figure 2. This visual progression highlights the critical transition from an apparently asymptomatic state to a severe inflammatory response, demonstrating the complex and unpredictable nature of COVID-19's clinical manifestation. The dramatic difference between the two imaging studies emphasizes the importance of serial imaging and careful clinical monitoring, particularly in cases where initial diagnostic findings may be non-specific or inconclusive.

Figure 1. Thorax computed tomography scan image of the patient.

Table 1. The laboratory test results of the patient

	Conventional units	Normal range	International system units	Normal range
ALT (GPT)	34.90 U/L	<31.00 U/L	0.59 µkat/L	<0.53 µkat/L
AST (GOT)	29.00 U/L	<31.00 U/L	0.49 µkat/L	<0.53 µkat/L
GGT	40.00 U/L	9.00–54.00 U/L	0.68 µkat/L	0.15–0.92 µkat/L
ALP	56.10 U/L	35.00–104.00 U/L	0.95 µkat/L	0.60–1.77 µkat/L
LDH	502.00 U/L	<480.00 U/L	8.53 µkat/L	8.16 µkat/L
Total bilirubin	0.40 mg/dL	<1.20 mg/dL	6.84 µmol/L	<20.52 µmol/L
Direct bilirubin	0.23 mg/dL	<0.30 mg/dL	3.93 µmol/L	<5.13 µmol/L
Ferritin	463.00 ng/mL	15.00–150.00 ng/mL	463.00 µg/L	15.00–150.00 µg/L
D-Dimer	0.13 µg/mL	<0.50 µg/mL	130.00 ng/mL	<500.00 ng/mL
CRP	79.20 mg/L	<5.00 mg/L	7.92 mg/L	<5.00 mg/L

ALP: Alkaline phosphatase; ALT: Alanine aminotransferase; AST: Aspartate aminotransferase; CRP: C-reactive proteins; LDH: Lactate dehydrogenase.

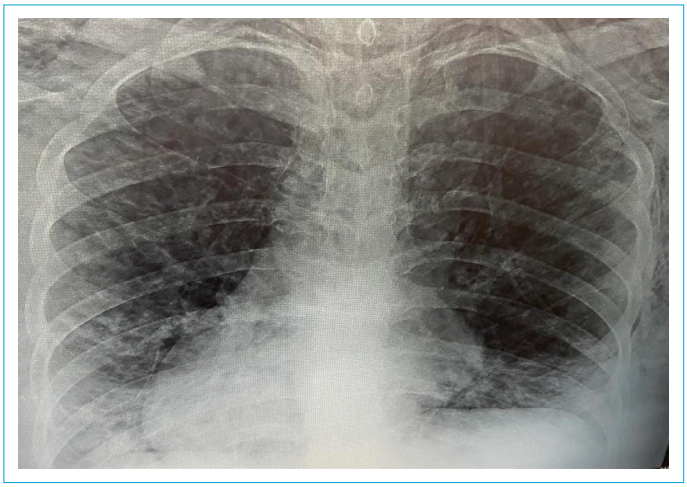

Figure 2. Chest X-ray of the patient.

The patient was hospitalized and suffered from low blood pressure (average 90/56 mmHg) for a month after recovery.

DISCUSSION

This case study aims to show that some cases of COVID-19 may experience hypotension. Angiotensin-converting enzyme 2, the primary gene involved in the etiology of hypertension, the primary binding receptor facilitating SARS-CoV-2 cell entrance in the organism, is usually upregulated, according to preclinical research employing these medication classes proven by Gallo et al. 2022.[6] Recent months have seen a number of papers demonstrating the potential link between hypertension and both the development of a worse prognosis for COVID-19 and the likelihood of SARS-CoV-2 infection.[7-10] The case involved a 22-year-old female who initially presented with bronchitis as well as a cough, quickly developing into a severe symptom of COVID-19 along with a hypotensive state that required hospitalization. Laboratory test results for our COVID-19 patient showed high CRP and an unexplained increase in Ferritin serum level in the 2nd week of the course of infection. LDH >500 U/L normal <450 U/L (represents organ damage), increased ferritin >450 ng/mL, CRP nearly 80 mg/L, hemoglobin level was 11.5 mg/dL.

Many studies confirmed the association between the severity of COVID-19 infection and the presence of hypertension.[2,3] However, recent reports confirmed that there is no association between hypertension and SARS-CoV-2 or its severity. Hypertension is extremely prevalent in adults, and they appear to be at particular risk of being infected with COVID-19 infection and those who are experiencing severe clinical manifestations and complications of COVID-19.[4] Recent reports showed that respiratory decompensated patients had increased blood pressure, possibly due to the viral effect on the renin-angiotensin-aldosterone system by COVID-19 infection.[5] Previous reports showed involvement of the autonomic nervous system, particularly in sympathetic skin reaction due to COVID-19 infection.[11] The present patient had low blood pressure during the infection, which lasted for a month after recovery (blood pressure was an average of 90/56 most of the time).

CONCLUSION

COVID-19 infection may potentially cause a hypotensive state for some unique features patients during the course of infection and may last for several weeks after recovery.[12] Autonomic response especially hypertension is an important aspect in the context of COVID-19 prevention and treatment.

Disclosures

Informed Consent: A written informed consent was obtained from the patient herself.

Conflict of Interest: The authors report no conflict of interest.

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