

A peacekeeper with a severe malaria and covid-19 co-infection

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Abstrat: *The ongoing outbreak of COVID-19 presents an unprecedented challenge to global health. Due to the variety of its clinical manifestations, it may be challenging to distinguish COVID-19 from a range of diseases with similar presentations, such as malaria, especially in endemic areas. We present a confirmed case of COVID and severe malaria co-infection. In this case, we underline the need for vigilance from frontline physicians for timely diagnosis and appropriate clinical management of potential co-infections in the COVID era.*

Keywords: Severe malaria, Plasmodium falciparum, Covid-19, Respiratory distress

Introduction

SARS-CoV-2 is a new strain of coronavirus that started at the end of 2019 in China and has spread worldwide ¹. The current outbreak of COVID-19 poses an unprecedented global health challenge. With its diverse clinical manifestations including, but not limited to, fever, cough, diarrhea, vomiting, headache, myalgia, and fatigue, it can be difficult to distinguish COVID-19 from a spectrum of diseases with similar presentations, such as malaria, especially in endemic areas ².

The co-infection between malaria and COVID-19 is not understood or completely reported. In our case, the patient was found to have severe malaria and tested positive for SARS-CoV-2.

Case Presentation

The above 34-year-old patient with no past medical history was med evacuated to Level 2 Hospital Bunia in Democratic Republic of Congo (DRC) from deployment area on March 2021. His medevac request noted that the patient reported with complaints of fever, headache, vomiting, hematuria, and severe weakness for 02 days.

The patient was admitted and the examination found: patient in poor general condition, confused, Glasgow Score at 14/15, mucocutaneous icterus, febrile with a temperature of 41°C, blood pressure (BP) of 85/50 mmHg, tachycardic with a heart rate (HR) of 138 beats per minute, tachypneic with a respiratory rate (RR) of 22 breaths per minute, with saturation of peripheral oxygen (SpO₂) of 96 % on room air, the rest of examination were within normal limits.

Laboratory investigations were significant for a normal leucocyte count (8.2 x10³ /μL), and thrombocytopenia with platelet count 24 x 10³/mL, and anemia with hemoglobin count 9.6.g/dL and abnormalities suggestive of haemolysis: rise in lactate dehydrogenase (LDH) at 560 U/L and total bilirubin at 34 mg/L with a low haptoglobin of 0.13 g/L, elevated liver aminotransferases (AST and ALT > 6x upper limit of normal), kidney function test was normal, blood sugar: 1.13 g/l, plasma bicarbonate < 12 mmol/l; CRP: 46 mg/l, serological tests for Hepatitis A, B and C and HIV were negative, hematuria confirmed by urine analysis.

Abdominal ultrasonography ruled out biliary tract or gall bladder infection and no evidence of cholelithiasis, Chest X-Ray was normal. ECG found a tachycardia for sinus rhythm, and rt-PCR test for SARS-Cov-2 which returned negative and the complete infectious check-up was negative

Considering this clinical presentation and the epidemiological context in the DRC, the test for malaria was done which came back positive with a blood smear and thick drop positive for Plasmodium falciparum with a parasitaemia of 4.1%.

The patient was diagnosed as severe malaria and admitted to intensive care unit (ICU). He was treated with intravenous Artesunate at a dose of 2.4 mg/kg at 0, 12, 24, and once the patient was able to tolerate oral therapy, anti-malarial treatment was continued with Artemether-lumefantrine for 3 days ³.

The progress was marked by improvement as BP maintained at normal values, but the patient still had a fever and respiratory distress. This fact made us to suspect a resistance to Artemisinin derivative. However, the epidemiological context and the blood test showed an improvement with a parasitaemia of 0.1% ⁴. In this clinical situation, the patient was undergone for a second rt-PCR test for SARS-Cov-2 which returned positive, and rapid antigen test found IgM positive and IgG negative. The patient was diagnosed as a case of co-infection with severe malaria and Covid -19

The patient was admitted to ICU in Covid-19 Healthcare Center of Bunia in Level 2 hospital and put on treatment: Oxygen supplementation 3L/min, Chloroquine 500mg: 1 tabx2/day for 10 days, Azithromycin 500 mg: 1 tab/1st day, then ½ tab/d for 7 days, Vitamin C 1000 mg: 1 tab x2/day for 10 days, Enoxaparin 4000 UI: 1 SC inj/day for 10 days, and the malaria treatment was continued.

On the above treatment, his condition remarkably improved clinically and biologically, with a progressive weaning of oxygen on the fifth day of his hospitalization.

Upon discharge, laboratory investigations revealed normal white blood cell count $6.8 \times 10^3/\text{mL}$, hemoglobin 13.6 g/dL, improving platelet count $185 \times 10^3/\text{mL}$, thick and thin blood smears were negative, and two negative covid-19 rt-PCR tests at 24 hours apart. He was cleared for discharge from the hospital with recommendation to self-quarantine for 7 days before resuming his duty, reinforce personal protective measures against mosquito bites, Chemoprophylaxis: Mefloquine 250 mg 1 tab every week. Three months later, the patient was vaccinated against Covid-19

Discussion

Malaria is still one of the main infectious diseases that have a major impact on the health system, with a potential risk of death, especially in tropical areas ⁵.

Although COVID-19 initially started in China, it has now spread worldwide. Patients infected with SARS-CoV-2 may have different manifestations, ranging from asymptomatic to severe respiratory failure, but may have also extra pulmonary symptoms. However, fever, shortness of breath, sore throat and cough are still the most common symptoms ⁶. The disease is mainly spread through respiratory droplets during close contact, although the ability to spread through the air is still questionable. Moreover, some studies have documented other modes of transmission, mainly extra pulmonary, such as fecal-oral ⁷. Currently, the global healthcare system is under unprecedented pressure, and physicians continue to play a crucial role in the timely identification of the Covid-19 outbreak and related clinical management, especially in conflict areas

So far, there are no universally recognized guidelines for the treatment of Covid-19 disease. Nevertheless, several treatment options have been developed. Among them, hydroxychloroquine is an antimalarial drug that has been shown to have in vitro activity against the virus ⁸.

As far as we know, no previous studies have documented the co-infection of Plasmodium falciparum malaria and Covid-19. Furthermore, the pathophysiology behind this event is still unclear. Nonetheless, it is not clear whether SARS-CoV-2 infection reduces the immunity that led to a malaria flare-up, or whether malaria complications increase the risk of contracting Covid-19. In addition, it is not yet determined whether antimalarial drugs can improve or mask the symptoms of Covid-19.

Physicians must remember that neither co-infection with pathogens can be ruled out when Covid-19 is confirmed nor a positive test for other pathogens completely negates the presence of Covid-19 co-infection

Conclusion

Physicians should proactively suspect Covid-19 in patients with other diseases presenting symptoms suggestive of SARS-CoV-2 infection, bearing in mind the possibility of co-infection and the epidemiological situation of the local area. In addition, further studies are needed to understand the pathophysiology and clinical significance of this co-infection

Statement of Ethics

Written informed consent was obtained from the patient for publication of this case report.

Conflict of Interest Statement

The authors declare that they have no competing interests.

Abbreviations

SARS-CoV-2 Disease COVID-19

BP Blood pressure

HR Heart rate

RR Respiratory rate

SpO₂ Saturation of peripheral oxygen

ICU Intensive care unit

rt-PCR Real-Time-Polymerase-Chain-Reaction

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