Atypical presentation of COVID-19 in a diabetic patient with malaria-like symptoms: case report

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Submitted: July 2020
Accepted: August 2020
Published: December 2020

Citation:
Elmalik et al. Atypical Presentation of COVID-19 in Diabetic Patient, with Malaria-like Symptoms: case report. South Sudan Medical Journal 2020; 13(5):196-199

Abstract

Since the emergence of the coronavirus (COVID-19) pandemic beginning in China in 2019, all health workers have faced a difficult challenge. One challenge is a clinical picture in some cases, where the presenting symptoms do not fit with the usual pattern. In this report, we present a case whose initial symptoms were headache, dizziness, and vomiting suggesting malaria bearing in mind that the patient was from Sudan, where there is a high incidence of malaria.

These unusual symptoms may be attributed to the presence of the receptor ACE2, in various body systems. The mild pathological course may be related to the patient's age and the fact that diabetic patients are less likely to develop lung injury, hence the absence of respiratory symptoms.

We recommend that physicians are alert to the variety of different presenting features of COVID-19 and test with Polymerase Chain Reaction (PCR) whenever there is doubt.

Introduction

COVID-19 is a viral disease that infects the respiratory system, and usually, a patient suffers from high fever, fatigue, headache, cough, and shortness of breath.[1] This pandemic carries a staggering burden in terms of expenditure on detection, prevention, and treatment, in addition to the loss of life and collapse of the health systems.[2] However, many reports have recorded unusual clinical features such as diarrhoea, abdominal pain, testicular pain, and stroke-like symptoms.[3,4]

The unusual clinical features cause confusion to the unwary clinician with delayed diagnosis and poorer outcomes. This is especially so if the clinical features are similar to a common disease in the region such as malaria in Sudan, where, despite the lack of statistical studies incidence is estimated at about nine million cases, and the mortality rate about three million cases a year. Thus, malaria is an endemic disease in Sudan.[5]

This report presents a case of COVID-19 infection with unusual symptoms and hence emphasises the need to add these features to those when COVID-19 must be considered.

Case Report

A 23-year old female living in Sudan complained of three days of headache and dizziness and vomiting for one day before hospital admission. The moderate bitemporal headache was of sudden onset with a feeling of pressure over the left eye. A day prior to admission, she felt suddenly dizzy that was worse when she lay down and improved on standing, and associated with vomiting after eating. She has type-1 diabetes and is on an insulin pump. She said that she had been in hospital recently with symptoms of hypoglycaemia. A blood sugar level was 50 mg/dl (Reference range 80 – 140 mg/dl). She received 50% dextrose intravenously and was discharged on the same day. The patient told us that she had not complained of headache, dizziness, and vomiting with those characteristics before. Nor did those symptoms appear in her family. She also denied that mosquitoes were in her area, distant travel, or recent direct contact

Table 1. Changes in symptoms since the day of COVID-19 confirmation (Day 8 of the initial admission)

The evening of the first day	Dizziness, cough and severity of the sore throat increases as the moderate headache and repeated sneezing persist
Day 2 and 3	Fatigue and fever intensity increase, previous symptoms persist
Day 4	Fever gradually improving and shortness of breath is emerging again
Day 5	A severe headache reappeared, dizziness and vomiting improved
Day 6 to 8	Mild fever with a less severe headache
Day 9	The disappearance of fatigue and improvement of the general situation but dry cough and sore throat continue
Day 10	The dry cough became productive and sore throat began to improve
Day11 to 13	Continued productive cough
Day 14	Improvement of productive cough began
Day 15	Mild fever reappears

with a COVID-19 patient.

On examination her pulse rate was 117 beats per minute, respiration rate 17 breaths per minute, temperature 36.9 °C, blood pressure 110/70 mmHg, oxygen saturation 98%. Examination of the nervous system was normal (GCS 15), the cardiovascular system was normal, chest auscultation was clear. However, there was tenderness in the epigastric and periumbilical regions. A peripheral blood film (PBF) for malarial parasites was negative. Other tests showed:

White blood cells (WBCs) was 9×10^9 /L(Reference range 4.5 – 11×10^9 /L)

Lymphocyte was 1.2×10^9 /L(Reference range 1.5 – 4.5×10^9 /L)

Monocyte was 0.3×10^9 /L(Reference range 0.2 – 0.8×10^9 /L)

Eosinophils was 0.2×10^9 /L(Reference range 0 – 0.4×10^9 /L)

CRP was 1.2 mg/dL (Reference range 0 -1 mg/dL)

ESR was 23 mm in one hour (Reference range 1 – 20 mm in one hour)

In spite of the negative slide for malarial parasites she was treated empirically for malaria with Artemether-Lumefantrine (80/480) tablets, twice daily for three days.

After seven days from admission, the dizziness and vomiting improved. However, the patient began to complain of a mild fever but less severe headache. The next morning, she complained of a dry cough, sore throat, shortness of breath, and repeated sneezing and COVID-19 was suspected. A nasopharyngeal swab was taken and a PCR test was positive for COVID-19 infection.

The patient was isolated. Paracetamol 500 mg tablets were given as required., Vitamin-C one tablet daily to reduce the damage extent that COVID-19 cause, Vitamin-D capsules 400 IU per day to enhance the immunological function, azithromycin 500 mg on day 1, then 250 mg on days 2-5 due to its antiviral effect and immunity boost, and dextromethorphan hydrobromide was given to ease cough. It was also recommended that an oxygen cylinder be brought for use on demand.

The patient was closely monitored and adequate nourishment was ensured. The changes in symptoms are summarised in Table 1.

Discussion

This case draws attention to the fact that COVID-19 may present as a mild to moderate illness free from complications. Later it may develop into a more serious condition. COVID-19 has been classified into the mild, severe and critical categories listed in Table 2.[6]

In another study, diabetic patients appeared to be less susceptible to acute lung injury and the development of acute respiratory distress syndrome (ARDS).[7, 8]

Respiratory complications are among the most serious complications with a high mortality. The age of a patient and severity of the disease are directly related.[9]

The delay in the diagnosis of COVID-19 because of the unusual initial symptoms exposed doctors and healthcare workers and family members to an increased risk of infection especially since she had visited the hospital twice before the correct diagnosis was made. This is of course in addition to her probable infectivity during a preceding asymptomatic period.

Fever is the most common symptom, followed by cough then fatigue.[10] But it is now realised there are a variety of other symptoms about which the clinician must be aware. The basis for this variation in presentations may be related to ACE2, as several studies have mentioned. This receptor

Table 2. COVID-19 classification according to severity[6]

Mild	Absent or mild pneumonia.
Severe	Shortness of breath, respiratory rate more than 29/min, oxygen saturation less than 94%, lung infiltrate 50% within 24 to 48 hours, or PaO2/FiO2 ratio less than 300.
Critical	Respiratory failure, multiple organ failure, or septic shock.

is responsible for the formation of vasodilator peptides and found in many places in the human body, including the digestive system and brain hence possibly causing vomiting, headache, and dizziness.[11,12]

Consideration of the differential diagnoses is crucial when presented with non-specific symptoms that might be caused by a number of infectious diseases, especially if they are common in the region. In Thailand, which is a tropical area, it is likely that COVID-19 will be confused with tropical diseases. A series of cases (48) were reported with a petechial rash, and thrombocytopaenia which were initially thought to indicate dengue fever.[13]

In our case the main complaints in the first presentation were headache, dizziness, and vomiting, symptoms that could indicate malaria, neurological disease, or meningitis. However, the neurological examination was normal. Although the peripheral blood film did not show malarial parasites, it is clinical practice in Sudan to consider a diagnose malaria if eosinophils are more than or equal to 0.2, and there are increased monocytes. However, the normal WBCs, low lymphocyte count, and increased ESR and CRP indicate a coronavirus.[14,15]

Conclusion

This case adds to our knowledge about the presentations of COVID-19 and how they might mimic other conditions, malaria in particular. Some differentials of the WBCs such as high monocyte and eosinophils counts suggested a diagnosis of malaria.

We recommend that clinicians should be alert to the possibility of COVID-19 whenever a patient presents with non-specific features and make modifications to the triage system to include recorded unusual symptoms. If there is any doubt a test for COVID-19 should be requested especially if the patient has another condition (e.g. diabetes, chronic respiratory disease) that puts them into a higher risk group that should be managed by intensive care. A delayed diagnosis may increase the severity of the disease, resulting in complications and even death. In addition, the risk of further spread of infection is increased.

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Malaria Resources: Women and children

Deleterious effects of malaria in pregnancy on the developing fetus: a review on prevention and treatment with antimalarial drugs

Saito et al. Lancet October 2020 DOI: https://doi.org/10.1016/S2352-4642(20)30099-7

All malaria infections are harmful to both the pregnant mother and the developing fetus. One in ten maternal deaths in malaria endemic countries are estimated to result from *Plasmodium falciparum* infection. Malaria is associated with a 3–4 times increased risk of miscarriage and a substantially increased risk of stillbirth. Current treatment and prevention strategies reduce, but do not eliminate, malaria's damaging effects on pregnancy outcomes.

Reviewing evidence generated from meta-analyses, systematic reviews, and observational data, this first paper in this Lancet Series aims to summarise the adverse effects of malaria in pregnancy on the fetus and how the current drug treatment and prevention strategies can alleviate these effects.

Although evidence supports the safety and treatment efficacy of artemisinin-based combination therapies in the first trimester, these therapies have not been recommended by WHO for the treatment of malaria at this stage of pregnancy. Intermittent preventive treatment of malaria in pregnancy with sulfadoxine–pyrimethamine is contraindicated in the first trimester and provides imperfect chemoprevention because of inadequate dosing, poor (few and late) antenatal clinic attendance, increasing antimalarial drug resistance, and decreasing naturally acquired maternal immunity due to the decreased incidence of malaria.

Alternative strategies to prevent malaria in pregnancy are needed. The prevention of all malaria infections by providing sustained exposure to effective concentrations of antimalarial drugs is key to reducing the adverse effects of malaria in pregnancy.

Treatment and prevention of malaria in children

Ashley and Poespoprodjo. Lancet October 2020 DOI: https://doi.org/10.1016/S2352-4642(20)30127-9

Malaria disproportionately affects children younger than 5 years. Falciparum malaria is responsible for more than 200 000 child deaths per year in Africa. For the treatment of malaria in children, paediatric dosing recommendations for several agents, including parenteral artesunate and dihydroartemisinin–piperaquine, have belatedly been shown to be suboptimal.

Worsening antimalarial resistance in Plasmodium falciparum in the Greater Mekong Subregion threatens to undermine global efforts to control malaria. Triple antimalarial combination therapies are being evaluated to try to impede this threat. The RTS,S/AS01 vaccine gives partial protection against falciparum malaria and is being evaluated in large, pilot studies in Ghana, Malawi, and Kenya as a complementary tool to other preventive measures.

Seasonal malaria chemoprevention in west Africa has resulted in declines in malaria incidence and deaths and there is interest in scaling up efforts by expanding the age range of eligible recipients. Preventing relapse in *Plasmodium vivax* infection with primaquine is challenging because treating children who have G6PD deficiency with primaquine can cause acute haemolytic anaemia. The safety of escalating dose regimens for primaquine is being studied to mitigate this risk.