

INTRODUCTION

A common presentation in the Emergency Department is a patient with hypoxia and a positive COVID-19 test. These patients are often diagnosed with COVID-19 pneumonia. However, there are alternative life-threatening causes of hypoxia. We report a fatal case of Dengue and COVID-19 co-infection presenting with oxidative hemolytic crisis with methemoglobinemia in a patient with G6PD deficiency.

CASE

A 65-year-old male with a history of ischemic heart disease, asthma, hypertension and hyperlipidemia presented with fever for 5 days. He had no cough, rhinorrhea, chest pain or shortness of breath. His saturations on room air was 78%, and on 15L of oxygen, his saturations was 82%. On examination, vesicular breath sounds were heard, no wheeze, no crepitations, no bronchial breath sounds. The rest of physical examination was unremarkable. His COVID-19 Antigen Rapid Test was positive. The provisional diagnosis in the Emergency Department was severe COVID-19 pneumonia.

- However, his chest X-ray was clear.
- Arterial blood gas done on 15L of oxygen showed a pH 7.44, pO₂ 400 mmHg, pCO₂ 26.5 mmHg, bicarbonate of 17.9, base excess of -6.
- In view of the saturation gap, a methemoglobin level was sent and it returned as 10.3% (reference range 0-2%).
- His G6PD level was found to be deficient qualitatively.

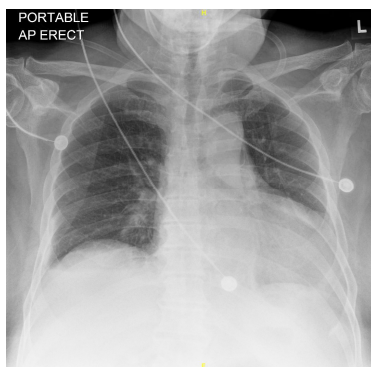


Figure 1. Chest X-ray on admission



Figure 2. Black urine from hemolysis

- On clarification, he did not take any antibiotics or new medications recently.
- He developed new onset of jaundice and his urine turned black.
- His liver function test was severely deranged. Heinz bodies and bite cells were positive in his blood.
- He was commenced on intravenous ascorbic acid and exchange transfusion.

		Reference range
Total bilirubin	191 µmol/L	1-20µmol/L
Aspartate transaminase	9549 U/L	6-35 U/L
Alanine transaminase	3304 U/L	6-40 U/L
Alkaline phosphatase	179 U/L	30-110 U/L
Ferritin	>33511 µmol/L	22-275µmol/L
Haptoglobin	<0.08 g/L	0.40-2.68 g/L
Lactate dehydrogenase	6719 U/L	120-250 U/L

Table 1. Liver function test, hemolysis markers

CASE (continued)

At this point, a mild COVID-19 infection alone seemed unlikely to be the sole trigger behind the oxidative crisis. Given the patient was at Day 5 of fever with progressive thrombocytopenia, dengue serology was sent along with common viral hepatitis markers.

Dengue serology	NS1 negative, IgM and IgG positive
Dengue PCR	Positive
Malaria microscopy	Negative
HBsAg	Non-reactive
Anti-HBs Ab	<2
Anti-HBc Ab	Non-reactive
Anti-HCV Ab	Non-reactive
Anti-HAV IgM	Non-reactive
Hep E PCR	Not detected
HIV Ag-Ab	Non-reactive
CMV, EBV, VZV, HSV PCR	Not detected

Table 2. Dengue, malaria and viral hepatitis tests

- Dengue screen returned positive.
- Malaria microscopy was negative.
- His hepatitis evaluation was unremarkable.
- All blood cultures were negative.

He developed multiorgan failure and macrophage activation syndrome. He was assessed to be unsuitable for extracorporeal membrane oxygenation due to hemodynamic instability and multiorgan failure. He was given intravenous immunoglobulin, pulse methylprednisolone and a dose of Anakinra 100mg. Despite the best of our efforts, he passed on within 72h from admission.

DISCUSSION

- This patient presented with tissue hypoxia with an oxygen saturation gap, where there is absence of hypoxemia despite evidence of hypoxia. This raises suspicion for methemoglobinemia and would not be in keeping with a diagnosis of severe COVID-19 pneumonia.
- Identifying the presence of G6PD deficiency as well as the potential triggers including drugs such as dapsone and anti-malarial agents, viral infections including dengue infection, COVID-19 infection, acute HIV infection, hepatitis A and E infection and cytomegalovirus infection are crucial.

References

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