

Methemoglobinemia diagnosed intraoperatively in a COVID-19 positive patient; a case study in Sharjah Kuwaiti Hospital

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Introduction:

Methemoglobinemia is a rare but potentially life-threatening condition where a dysfunctional form of hemoglobin is present in excess due to conversion of iron species from the ferrous to Ferric form, which leads to impaired oxygen-carrying capacity. It can be either congenital or acquired, However the acquired methemoglobinemia, is more common. The clinical presentation of Methemoglobinemia varies. In light of the SARS - Coronavirus disease 2019 (COVID-19) pandemic, cases of methemoglobinemia have been reported to be on the rise, as the Coronavirus has been associated with a range of hematologic findings and complications. The critical illness resulting from the viral infection lead can to oxidative stress which associated with a predisposed hemolytic condition can leave the patient with increased susceptibility to Methemoglobinemia . However the diagnosis of methemoglobinemia is often overlooked given its rarity and its variable presentation. The methemoglobinemia presentation of hypoxia and deranged SpO2 might initially be considered as symptoms of COVID-19 infection.

This article discusses methemoglobinemia, the definition, underlying pathophysiology, etiology as well as the clinical presentation. Also case summary of this patient condition from presentation, to diagnosis and multimodal management implemented.

Case description :

A 37 year old male presented to our A/E with acute abdomen, was diagnosed as a case of acute appendicitis, was found to be COVID-19 positive on PCR incidentally before being taken for surgery. Patient then developed respiratory symptoms and low SpO2 despite oxygenation. He was diagnosed with methemoglobin intra-operatively due to a positive Saturation gap, Co-oximeter indicating high levels of Met-hem. Patient was managed by interdisciplinary team approach, between medical , surgical , anesthesia and hematology teams as a case of methemoglobinemia, active moderate COVID-19 infection as well as complicated appendicitis.

Discussion :

Amidst the COVID-19 pandemic, rare conditions as methemoglobinemia may be overlooked and underdiagnosed. Triad of Chocolate colored blood, positive saturation gap and hypoxia refractory to Oxygen supplementation remain highly diagnostic of methemoglobinemia. It is

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unclear if any additional properties of COVID-19, besides inducing oxidative stress during severe illness, might predispose to methemoglobinemia. Given the many atypical properties of this pandemic this is certainly worth consideration, however, rigorous evidence linking the two remains lacking. Treatment is largely dependent on the degree of methemoglobinemia, the presenting symptoms and severity. Methylene blue is the first-line treatment.

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