CASE REPORT: REFRACTORY METHEMOGLOBINEMIA IN A 19-YEAR-OLD FEMALE AFTER INGESTION OF AGRICULTURAL BIO-NUTRITION PRODUCT REQUIRING EXCHANGE TRANSFUSION

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ABSTRACT

A 19-year-old female ingested approximately 40–50 mL of a bio-nutrition agricultural product containing unknown nitrite compounds. She presented four hours post-ingestion with hypotension, peripheral cyanosis, and refractory hypoxia. Initial management included intubation, mechanical ventilation, methylene blue (40 mg/day), and ascorbic acid without significant improvement. Three sessions of exchange transfusion were performed, after which the peripheral oxygen saturation improved from 70% to 96%. This case highlights exchange transfusion as an effective salvage therapy in severe methemoglobinemia unresponsive to standard treatment.

INTRODUCTION

Methemoglobinemia is characterized by oxidation of ferrous (Fe2+) hemoglobin to ferric (Fe3+) form, impairing oxygen delivery and leading to tissue hypoxia and cyanosis unresponsive to oxygen therapy. [1] Common causes include exposure to oxidizing agents such as nitrites, anilines, and certain pharmaceuticals. [2] Standard treatment involves intravenous methylene blue and ascorbic acid. [3] Refractory hypoxia can be treated with exchange transfusion or hyperpbaric oxygen therapy.[4]

CASE REPORT

A 19-year-old female with no significant past medical history ingested approximately 40–50 mL of 'Hara Bhara' bio-nutrition product at 12:30 PM on 6 May 2025. She experienced 3–5 episodes of vomiting, altered sensorium, and difficulty in breathing at rest. The patient presented to the emergency department at 4:30 PM.

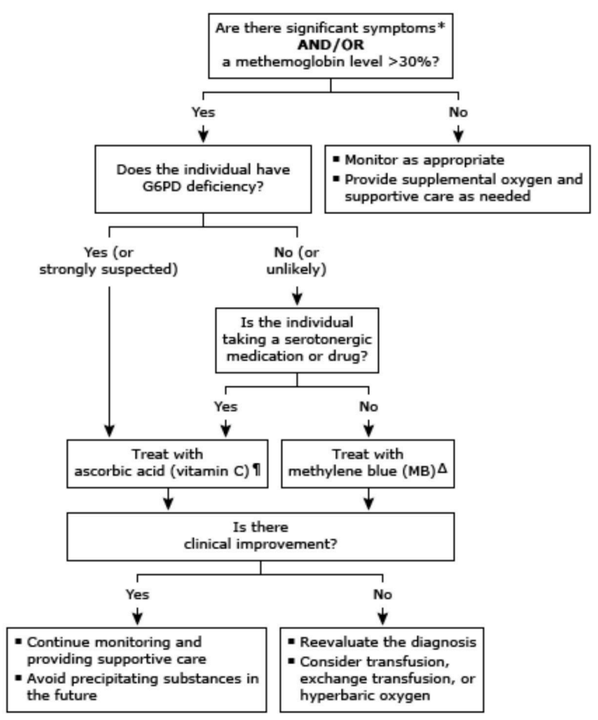
On examination, her heart rate was 108 beats/min, respiratory rate 22 breaths/min, blood pressure 60/– mmHg, and peripheral oxygen saturation (SpO2) 70% on room air. She exhibited peripheral cyanosis. Endotracheal intubation was performed, and mechanical ventilation with FiO2 100% was initiated, but SpO2 remained at 70% due to peripheral cyanosis

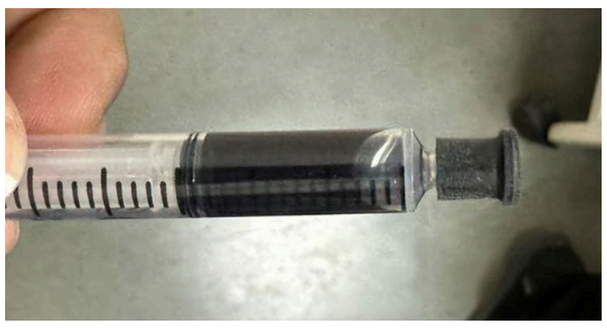
Laboratory investigations revealed: Methemoglobin level of 2.7% (reference: <1%), severe anemia (Hb: 7.2 g/dL), leukocytosis (WBC: 16150 /uL, Neutrophils: 81.1%), and thrombocytosis (Platelets: 317000 /uL). Initial therapy included intravenous methylene blue 40 mg/day and ascorbic acid, without significant improvement.

Given persistent hypoxia on pulse oximetry & presence of cynosis three sessions of exchange transfusion were performed and correction of anemia & other supportive treatment given. SpO2 improved progressively: 75% after the first, 86% after the second, and 96% after the third. She was weaned off mechanical ventilation and extubated successfully on day 5 post-ingestion, with full recovery.

RESULTS

This case illustrates severe methemoglobinemia induced by ingestion of an agricultural product likely containing nitrite compounds. The patient's hypoxia was refractory to standard treatment with methylene blue and ascorbic acid. [6] Exchange transfusion effectively reduced methemoglobin levels and restored oxygen-carrying capacity. [7] The role of exchange transfusion as salvage therapy in life-threatening methemoglobinemia unresponsive to pharmacologic antidotes is supported by case reports and guidelines. Prompt diagnosis and timely intervention are essential for favorable outcomes. [8]





CONCLUSION

Severe methemoglobinemia following ingestion of oxidizing agents may not respond adequately to methylene blue and ascorbic acid. Exchange transfusion should be considered as an effective rescue therapy in refractory cases. Prompt diagnosis and timely intervention are essential for favorable outcomes.

RELATED LITERATURE
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