

**CASE REPORT TITLE- RARE CAUSE OF METHEMOGLOBINEMIA: NATURAL OIL COMPOUND CONSUMPTION****Internal Medicine****Dr. Akshay Popat Kute***

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ABSTRACT

As awareness regarding environmental safety grows, use of environment friendly biopesticides increasing day by day. Farmers are using new biotechnologically developed bio product that controls the sucking pests such as Thrips and Mites on different types of crops. Few are based on emulsified blend of natural oils and emulsifiers. Here we report a rare instance of intentional consumption of a plant immunity enhancer compound comprising natural oils, resulting in methemoglobinemia.

KEYWORDS

Natural Oil Biopesticide, Plant Immunity Enhancer, Methemoglobinemia, Pesticide, Natural Oil Poisoning, Methylene Blue, Neem Oil.

INTRODUCTION

Methemoglobinemia (MetHb) is a blood disorder in which an abnormal amount of methemoglobin is produced. Methemoglobin is a form of hemoglobin. With methemoglobinemia, the hemoglobin can carry oxygen, but is not able to release it effectively to body tissue, it leads to tissue hypoxia. Most commonly, induced methemoglobinemia can arise after exposure to a variety of compounds and exogenous oxidizing agent.¹

We report herein a case of acquired methemoglobinemia caused after intentional ingestion of plant immunity enhancer containing natural oil. This case report highlights the possibility of methemoglobinemia in cases of exposure to this natural oil with biological compounds presented with dyspnoea, dark blood, and decrease oxygen saturation. Early recognition and management can result a favourable outcome.

Case Description

A 35-year-old male was brought to emergency department (ED) by relatives at around 2 pm with alleged history of self-consumption of plant immunity enhancer compound containing natural oil at around 8 am in the morning. With history of 2-3 episode of vomiting after consumption.

Patient was brought in unconscious state with his Glasgow Coma Scale (GCS) 8/15, and vitals were unstable with a heart rate of 80/minute and a blood pressure of 110/70 mm Hg, his oxygen saturation of blood (SpO₂) was 60% on room air.

Patient was intubated in casualty and mechanical ventilation (assist control mode) started. He was shifted to our intensive care unit for further management. On arrival in the ICU (six hours after ingestion of pesticide), He was drowsy disoriented with GCS of 10/15, agitated and cyanosed (dark brown blue), His oxygen saturation of blood (SpO₂) was 86% on FiO₂ 100%.

He had no history of premorbid illnesses with no history of addiction. Patient was intubated and put on mechanical ventilation (assist control mode).

On examination chest was clear, no crepitation, no wheeze. Chest X ray was taken suggestive of no significant abnormality. ECG was done which was within normal limit. While routine blood examination, patient's blood was noticed to be muddy brown in colour.

An arterial blood gas analysis revealed a PaO₂ of 415 mm Hg on a FiO₂ of 1. Saturation gap measured by pulse oximetry was 86% on 100% oxygen and in ABG PaO₂ was 415mm Hg, and dark brown blood led to a high suspicion of methemoglobinemia secondary to ingestion of natural oil.



Fig 1. -The bottle of plant immunity enhancer called “Thyro super” (composition: neem oil, Karanj oil, DMF emulsifier 10%).

Blood sample was sent for estimation of methemoglobin levels. His initial methemoglobin level was found to be 22.3%. Patient was managed with mechanical ventilation. Inj. methylene blue 50mg in 100ml D5 over 10 min followed by 30mg over 3 hr followed by 30mg for next 2 days.

Tablet vitamin C 500 mg BID. The patient started showing signs of improvement, and his SpO₂ gradually improved to 90% on day 2. His sensorium improved further, the SpO₂ gradually increased over 3 days. The patient was subsequently extubated on day 3 and continued to maintain a SpO₂ of 98% on face mask with 2 L/minute of oxygen. MetHb levels slowly decreased and reached levels of <3% on the day of discharge (day 6).



Fig 2. – Colour of blood



Fig 3.– Methylene Blue-

DISCUSSION

Clinical symptoms that raise the possibility of methemoglobinemia diagnosis include cyanosis that is out of proportion to respiratory status and normal PaO₂, which does not improve with O₂ treatment, "oxygen saturation gap," and dark brown, or black blood samples.² In our patient, diagnosis of methemoglobinemia was made on triad of saturation gap, cyanosis, and dark blood.

Methemoglobinemia occurs when MetHb levels exceeds 2%. Normal MetHb levels are <1%. Symptoms of methemoglobinemia correlate with MetHb level in healthy patients. Cyanosis is reported at a MetHb level >15% in nonanemic patients; anxiety, headache, and dizziness at a MetHb level >20%; fatigue, confusion, and tachypnea between 30% and 50%; and arrhythmias, acidosis, seizures, and even death at a MetHb level >50%.^{1,3}

The first-line treatment of methemoglobinemia is intravenous administration of methylene. It is recommended specifically when MetHb levels are more >30% or symptoms were severe.⁴ Ascorbic acid or N-acetylcysteine, can be used. Exchange blood transfusion is recommended when methylene blue or alternative treatments are ineffective.⁵

The plant immunity enhancer our patient had consumed contains biological extracts (neem oil, karanja oil, DMF emulsifier). Neem oil is a mixture of components. Azadirachtin is the most active component for repelling and killing pests and can be extracted from neem oil.⁷ However, search has shown that biological extracts are known to be rich in nitrogenous products and may potentially cause methemoglobinemia.⁶

In conclusion, with the increasing number of natural and herbal oil compounds present in pesticides, medical professional should suspect potential to cause methemoglobinemia and treat as early as possible to prevent further complications. When determining the differential diagnosis of an unexplained cyanotic condition, low oxygen saturation on pulse oximetry, normal PaO₂, and chocolate-coloured blood, methemoglobinemia must be taken into account. Early recognition and timely treatment led to recovery with normal neurological function.

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