ORIGINAL RESEARCH PAPER

General Medicine

METHEMOGLOBINEMIA DUE TO ANILINE DYE POISIONING

KEY WORDS:
Methemoglobinemia, Methylene blue, Aniline

Dr. Jaisinha Mane	Jr3 Medicine
Dr. Arundhati Barua	Professor
Dr. Ravindra Sahay	Professor
Dr. Saurabh Kothari*	Associate Professor*Corresponding Author

ABSTRACT

Methemoglobinemia is a condition with life threatening potential in which diminution of the oxygen carrying capacity of circulating hemoglobin occurs due to conversion of iron from the reduced ferrous state to the oxidised ferric state. It can be both inherited and acquired. Aniline being one of common compound causing Methemoglobinemia. Aniline is a prototypical aromatic amine in a pale yellow liquid form with an unpleasant rotten fish odor. Accidental Occupational exposure to aniline can lead to inhalation, oral ingestion and absorption through skin.

INTRODUCTION

Methemoglobinemia is a condition with life threatening potential in which oxygen carrying capacity is decreased due to conversion of iron from its reduced ferrous form to oxidized ferric state

Causes –

Hereditary- NADH reductase deficiency, Hemoglobin M
Chemicals - Aniline, chlorobenzene, fungicides, herbicides, naphthalene, trinitrotoluene
Natural – Fire and smoke inhalation
Medication-Phenytoin, chloroquine, dapsone, benzocaine, nitrates, primaquine

CASE STUDY

37/male working in a paint manufacturing factory, had an accidental spillage of Aniline dye on his face and shirt. He came to the casualty with complains of breathlessness and cough.

Vitals- Pulse-80/min, BP-120/80mmhg, Spo2-72% on Room Air Patient came with blueish discoloration of skin, face and tongue. His fingers and toes were also blueish in shade.

ABG-
Ph-7.50, pCO2-30, pO2-148, HCO3-23, MethHb-58%

Treatment-

Removal of toxic agent
Oxygen support
Methylene blue -(1-2mg/kg) IV over 10-15 minutes for adults and 0.1-0.2 ml/kg IV for pediatric age group.

Repeat dose after 30-60 minutes if MethHb more than 30% or if patients are symptomatic.

Dextrose is given along with methylene blue as NADPH required for the reversal of MethHb to HB is made from hexomonophosphate shunt (HMS) – which requires glucose molecule as an source of energy.

Adjuvant therapy by high dose ascorbic acid(10g/day), hyperbaric oxygen chamber can be tried.

Side effect of methylene blue-

Extreme high dose can precipitate MethHb formation or cause hemolysis.

If a patient is on serotonergic drugs, it predisposes to serotonin syndrome.

G6PD deficiency is not a contraindication for methylene blue but it should be given at an appropriate dose for the effect to be substantial.(5mg/kg)

Discussion-

Iron in the ferric state has high affinity to oxygen and hence oxygen dissociation curve shifts to the left. Methylene dye is the treatment of choice for Methemoglobinemia.

CONCLUSIONS

Rapid clinical identification and treatment of methemoglobinemia reduces morbidity and mortality

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