



ACUTE KIDNEY INJURY AND HEMOLYTIC ANEMIA AFTER INGESTION OF 4 MOTHBALLS

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ABSTRACT

Mothball containing Naphthalene is commonly used in house hold in india. Poisioning is very rare with naphthalene ball. This is case of ingestional naphthalene poisoning. A 16- year old female ingested 4 mothballs, and presented two days later with haemolysis and acute kidney injury. She was given N-acetylcysteine. Hemodialysis was done. She was discharged with normal creatinine and hemoglobin levels.

Key words:

Hemolysis, Methemoglobinemia, N-acetylcysteine, Hemodialysis.

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INTRODUCTION

Naphthalene mothballs are commonly used in Indian households as deodorizer. Despite its wide spread use poisoning is rarely reported in Indian literature. Though accidental ingestion of mothballs, but use of naphthalene mothballs as a suicidal agent is not described much in literature. The patient presented with 4 episodes of vomiting on day 2 of ingestion and 3 episodes of loose stools on the 3rd day after ingestion. She had history of decreased urine output from day 5. The patient was admitted in our hospital after 8 days of ingestion on examination pallor and jaundice present. Treated with blood transfusion, hemodialysis and conservative care patient improved. The lethal dose of acute naphthalene toxicity is 5–15 g for adults, with the standard weight of one mothball being 4 g.

Case Report

An 16-year-old female committed suicide by ingestion of 4 moth balls presented to our hospital with history of 4 episodes of vomiting and 3 episodes of loose stools and decreased urine out put. On examination she is having tachycardia and her blood pressure was 100/70 mmHg. Pallor and jaundice are present. The urine was reddish black in color. The urine microscopy did not show any red blood cells (RBCs). Her hemoglobin was 7 g% and peripheral smear normocytic hypochromic anemia. liver function tests engymes are normal but there is indirect hyperbilirubinemia. Creatinine 18mg/dl and blood urea 524 mg/dl. we diagnosed it as acute naphthalene poisoning with hemolytic anemia with acute kidney injury.

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Table 1 Sequential value of laboratory parameters during hospital stay

Table with 5 columns: Parameter, Day 1 (23/01), Day 4 (26/01), Day 6 (28/01), Day of discharge. Rows include Hb (g/dL), Total bilirubin (mg/dL), In-Direct bilirubin (mg/dL), Creatinine (mg/dL), and Blood urea (mg/dl).

Abbreviations: HB Hemoglobin

Table 2 Arterial blood gas 27/01/2019 Suggestive of metabolic acidosis

Table with 2 columns: Ph, 7.317. Rows include pCO2, expected p co2, pO2, and SaO2.

Abbreviations: pCO2 Partial pressure of carbon dioxide, pO2 Partial pressure of oxygen, SaO2 Arterial oxygen saturation

She was hydrated adequately with monitoring of urinary output as well as serum creatinine. During hospital stay, she was transfused with two packs of red cell concentrate. Hemodialysis was done 4 times as she developed signs of uremia. Over a week, the hemoglobin levels increased and hemolysis settled. She never went into acute kidney injury.

DISCUSSION

Naphthalene (C10H8) is a volatile polycyclic hydrocarbon used as a deodorizer and moth repellent in households. Mothballs now contain 1,4-dichlorobenzene also labeled as para- dichlorobenzene or p-dichlorobenzene. Both of these

have strong pungent odor often associated with mothballs. Toxic effects had been reported through various modes of exposure, including inhalation, external skin contact, and ingestion. Myriads of clinical manifestations have been reported, yet few have been tabulated

Table 3 Systemic effects of naphthalene exposure

Gastrointestinal effects
Nausea, vomiting, abdominal pain, diarrhea
Renal effects
Increased creatinine level, increased serum urea nitrogen level, hematuria, renal tubular acidosis
Respiratory effects
Congestion, Acute Respiratory Distress Syndrome (noted at 2 ppm)
Neurologic effects
Confusion, lethargy, vertigo, fasciculations, convulsions, anesthesia, cerebral edema, coma (coma is noted at 0.05 mg/kg body weight per day)
Hepatic effects
Jaundice, hepatomegaly, elevated liver enzyme levels (noted at 0.02 mg/kg per day)
Ocular effects
Optic atrophy, bilateral cataracts with chronic exposure

Its toxic manifestations are mainly due to production of oxygen free radicals leading to lipid peroxidation and deoxyribonucleic acid (DNA) damage .. In addition to hemolysis, due to its potent oxidizing property, it converts hemoglobin to methemoglobin, leading to methemoglobinemia therefore, the presence of cyanosis with normal oxygen saturation in arterial blood gas should raise the suspicion of methemoglobinemia.

Significant intravascular hemolysis gives rise to hemoglobinuria due to resultant saturation of hemoglobin scavengers such as haptoglobin. This may lead to acute kidney injury due to tubular precipitation of free hemoglobin, which is seen in our patient. Hemolysis usually starts by the second day of exposure and can be protracted up until a week. Therefore, screening for hemolysis should continue until a week of post-exposure.

Unconjugated hyperbilirubinemia as well as high lactate dehydrogenase would also be found. Pigment nephropathy and acute kidney injury were prevented by adequate hydration and urine alkalization.

With regards to methemoglobinemia, the antidote would be methylene blue. However, an urgent G6PD enzyme assay is indispensable prior to the administration of methylene blue as it can paradoxically cause methemoglobinemia in G6PD-deficient patients. In this case methemoglobin levels were not done and methylene blue not given as treatment.

CONCLUSION

In setting of acute hemolysis and AKI can entertain a number of possibilities. The value of careful history elicitation which primarily benefitted in the right diagnosis and good outcome is highlighted.

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