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Psychiatric Illness and Naphthalene Poisoning: A Case Report.

Yajnesh Kidiyoor¹, Shipra Rai¹, Shankar M Bakkannavar^{2*}, Vinod C Nayak²,
Ranjit Immanuel James², Navin Patil³, and Kavitha Saravu¹.

¹Department of General Medicine, Kasturba Medical College, Manipal, Manipal University, Karnataka, India.

²Department of Forensic Medicine & Toxicology, Kasturba Medical College, Manipal, Manipal University, Karnataka, India.

³Department of Pharmacology, Kasturba Medical College, Manipal, Manipal University, Karnataka, India.

ABSTRACT

Naphthalene is an organic compound which is white crystalline solid with a characteristic odour. It is a common constituent in traditional mothballs and is mostly derived from coal tar. Structurally naphthalene can be viewed as fusion of pair of benzene rings. We are reporting a case of a 22 year old male, with known psychiatric illness presenting to the hospital emergency room with history of vomiting and red colored urine after alleged consumption of mothballs (Naphthalene). The case management and toxicity of naphthalene will be discussed.

Keywords: Naphthalene, psychiatric illness, toxicity.

**Corresponding author*

INTRODUCTION

Naphthalene was introduced as an antiseptic for typhoid fever way back in 1841 and as an anti-helminthic in 1842 by Rossbach [1]. Naphthalene is a natural constituent of coal tar (approximately 11%) and is also present in gasoline and diesel fuels. It has also been used in the manufacture of phthalic anhydride, phthalic and anthranilic acids, naphthols, naphthylamines, 1-naphthyl-n-methylcarbamate insecticide etc. Naphthalene consumption is not a routinely adopted method used for self-harm. Toxicities are usually due to accidental consumption by children.

Case History

A 22 year male, who had family history of psychiatric illness, was diagnosed 3 years back to have obsessive compulsive disorder, bipolar disorder with history of self-harm intentions and disturbed inter-personnel relationships with family members. He also had a history of chronic alcohol consumption and smoking since 15 years of age.

He presented to the emergency room with 3 – 6 episodes of vomiting, red colored urine, and yellowish discoloration of the eyes and body since 2 days following an alleged consumption of 3 mothballs 5 days previously. He also had a history of loss of appetite. On admission, his vitals were stable. During the course of hospital stay, he had progressively increasing unconjugated hyperbilirubinemia with decreasing hemoglobin levels (Table 1). Urine hemoglobin was positive with urine microscopy showing blood. He also had elevated lactate dehydrogenase levels with peripheral smear suggestive of hemolysis. In view of his history and the deranged blood parameters, he was diagnosed to have intravascular hemolysis. On account of worsening anemia he was transfused with packed red blood cells. He improved symptomatically after conservative management with the blood parameters showing gradual improvement. He was discharged after 6 days of admission.

Table 1: Investigations

Investigations	On admission	Day 2	Day 3	Day 4	Day 10
Haemoglobin(g/dl) /Haematocrit(%)	10.9/32.9	7.8/23	7.3/22	8.6/26.3	12.1/35.9
Total count(cells/ μ l)	12500	16400	9300	8600	4400
Platelet count(cells/ μ l)	187000	178000	154000	155000	198000
LDH(units/litre)		1637	1288	496	140
<i>Liver function test</i>					
Total bilirubin(mg/dl)	6.2	9.6	2.1		1.1
Direct bilirubin(mg/dl)	0.8	0.5	0.4		0.6
Indirect bilirubin(mg/dl)	5.4	9.1	1.7		0.5
AST/ALT*(units/litre)	52/25	70/25	58/20		45/22
Total protein(g/dl)	7.50	7.0			
Serum albumin(g/dl)	5.13	4.60			
Serum globulin(g/dl)	2.40	2.40			
<i>Renal function test(mg/dl)</i>					
Urea	42	55	38		30
Creatinine	0.8	0.8	0.8		0.9
Peripheral smear		Poikilocytes, schistocytes, spherocytess and fragmented RBCs: Suggestive of haemolysis			Normal
Random blood sugar(mg/dl)	130				
<i>Urine microscopy</i>					
Urine protein		2+			
Haemosiderin		Positive			
Blood		3+			
Urobilinogen		1+			
Urine haemoglobin		Positive			

* AST/ALT; Aspartate Aminotransferase/ Alanine Aminotransferase

DISCUSSION

Naphthalene balls are composed of hydrocarbon naphthalene which is a silvery white crystalline compound obtained from coal tar. It is used in various aspects such as deodorant in lavatories, as an insecticide, flea powders, vermifuges and moth repellent [2-4]. Naphthalene is metabolized into alpha and beta naphthol. Alpha naphthol directly acts upon the red cells and causes hemolysis [5], especially in patients who are having G6PD deficiency [6]. Naphthalene passes in urine in the form of glucuronate and ethyl sulphate.

The usual fatal dose of naphthalene varies for adults and children, fatal dose for adults is 5 – 15 gms and for children it is around 2 gms [7]. Manifestations of naphthalene poisoning are variable depending upon age, dose, route of administration and character of toxic response. Toxicity can occur through ingestion, skin contact and inhalation [7]. Naphthalene ingestion with a suicidal purpose is rare. During first 24 hours of ingestion, nausea and vomiting of varying intensity are noted. On the second day, fever appears which lasts for several days. Pallor, prostration, haemolysis, jaundice and haemoglobinuria appear on third day. The urine assumes a characteristic portwine colour. Spleen may be enlarged and renal failure may ensue. Albuminuria, haematuria and granular casts are seen in the urine. Naphthol may be demonstrated in urine at this time.

After 5-6 days, haemolysis stops but leukocytosis, oliguria and anuria persists due to lower nephron nephrosis. Blockade of renal tubule with haemoglobin may supervene or convalescence may begin which in the absence of complications is rapid. Cerebral oedema, confusion, convulsions, coma and death may occur [1, 6]. Laboratory findings are often comparable with acute hemolytic anaemia [8]. There is no specific treatment for naphthalene poisoning. The management is symptomatic with packed red cell transfusions and monitoring of fluid and electrolyte balance [8].

CONCLUSION

In our case, the patient was admitted with hemolytic symptoms and was treated with packed red blood cell transfusions and other supportive measures. He recovered after 5 days, became asymptomatic and was discharged. Proper history and timely diagnosis and intervention play a major role in the treatment of naphthalene poisoning since the symptoms can be mistaken for other differentials.

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