

Fatal hair dye poisoning: A case report

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ABSTRACT

Paraphenylenediamine (PPD) is a common ingredient in most of the hair dye preparations and poses an emerging threat as a suicidal agent. Clinical manifestations include numbness & burning of mouth, throat and vomiting along with respiratory distress and dysphagia. Rhabdomyolysis, intravascular hemolysis, oliguria/anuria, acute renal failure and toxic myocarditis have also been associated with the compound. This case report provides autopsy and toxicological findings in an intentional ingestion of hair dye preparation.

Key words: Hair dye, paraphenylenediamine, death, autopsy, toxicological findings

INTRODUCTION

Paraphenylenediamine (PPD) is a common ingredient in most of the hair dye preparations¹. Ingestion of PPD leads to angioedema, asphyxia, dysphagia, oliguria/anuria, acute renal failure, rhabdomyolysis, intravascular hemolysis, coagulation derangements and toxic myocarditis. Fatality is related to acute renal failure or myocardial damage^{2,3}. This case report provides autopsy and toxicological findings in an intentional ingestion of hair dye preparation.

CASE REPORT

A 27-year unmarried male was brought to private hospital with suicidal consumption of hair dye (Trade name concealed) at about 04:00 PM.

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On examination, patient was violent. He was managed supportively but developed cardiorespiratory arrest on same day at about 07:30 PM.

A forensic autopsy was conducted at Government Medical College & Hospital, Nagpur which discovered cyanosis with blood tinged froth oozing from mouth and nostrils. There was a fresh incised wound at left forearm on flexor aspect. Internal examination showed congested and edematous brain with fresh patchy subarachnoid hemorrhages scattered at multiple places. Mucosa of oral cavity, upper airway and upper alimentary tract was blackish in colour, swollen and corroded at places. Blood was dark and watery. Except petechial hemorrhages on epicardium, grossly heart was unremarkable. Lungs were congested and edematous. Abdominal organs were congested. On microscopy, brain and lungs were congested and edematous. Heart, liver and spleen were congested. Kidney showed congestion, edema and cloudy changes. Chemical analysis, conducted at Regional Forensic Science Laboratory Nagpur, revealed presence of PPD. In stomach and intestine PPD content was 1.5 mg per 100 gm whereas in liver, spleen and kidneys, it was 0.83

mg per 100 gm. Blood and gastric lavage levels were positive for PPD.

DISCUSSION

The stated hair dye is an emulsion type of preparation and contains PPD (not exceeding 4%), liquid paraffin, cetostearyl alcohol, sodium lauryl sulphate, EDTA disodium, resorcinol, and propylene glycol. On most of the occasions, PPD is responsible for the clinical features but toxicity due to disodium EDTA, in addition to PPD, is also reported. Resorcinol is a corrosive and causes methemoglobinemia².

Hair dye ingestion is an uncommon cause of attempted suicide in India as compared to some parts of the world such as Africa^{2,4}. However, recent review of Indian literature revealed that PPD is emerging threat for suicidal purpose^{3,5-7}.

Early manifestations (patient presenting within 4 to 6 hours of ingestion) include numbness & burning of mouth, throat and vomiting along with respiratory distress and dysphagia. Late manifestations (usually after 12 hours of ingestion) include rhabdomyolysis, intravascular hemolysis, oliguria/anuria, acute renal failure and toxic myocarditis¹.

The respiratory syndrome following the ingestion of PPD is represented by asphyxia and respiratory failure secondary to inflammatory edema involving cricopharynx and larynx⁴. The autopsy showed black staining, edema and erosion of upper airway. Therefore early securing of airway is cornerstone in PPD management and treating physicians need to be aware about such clinical presentation.

The kidneys are particularly vulnerable to the toxic effects of PPD. Hemolysis, rhabdomyolysis, methemoglobinemia and direct tubular toxicity are the possible mechanisms for acute renal failure^{3,8}. Postmortem examination showed features of cloudy degeneration to acute tubular necrosis³. The morbidity and mortality are high once renal failure develops⁹. However, with timely intervention, renal failure can be prevented. The

fresh hemorrhages noted at autopsy suggest coagulation derangement caused by hair dye and clinically needs proper evaluation and management.

The published literature revealed consumption of hair dye suspension from 100 ml to 300 ml (average 141.6 ml) to be fatal^{2,3}. In the stated case, the chemical analysis revealed that the 1.5 mg per 100 gm of PPD in stomach & intestine and 0.83 mg per 100 gm in liver, spleen & kidneys proved fatal.

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