



HAIR DYE POISONING

(An emerging emergency for airway surgeon- a case report)

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Abstract:

Super-Vasmol, a cheap, freely-available hair dye is emerging as a major cause of suicidal poisoning in India. It contains potential toxins including paraphenylenediamine, resorcinol, sodium ethylenediaminetetraacetic acid and propylene glycol which can result in multiorgan dysfunction². This case report is an attempt to throw light on this emerging problem.

Case report:

29 years old male came to our casualty with alleged history of ingestion of hair dye 5 hours back. He consumed 100 ml of hair dye with suicidal intention. Now he presented with complaints of difficulty in breathing for half an hour.

Patient is a cinema actor and he had some quarrel with his parents about his marriage for last one month. Suddenly the day evening he consumed hair dye at his home at 11 am when their parents not in home. Fortunately their relatives found him in the abnormal state and brought him to a general private practitioner with empty hair dye bottle. He referred him to our hospital for emergency management.

He presented with complaints of breathing difficulty for half an hour. And they complaints of swelling of the face, tongue, and neck. There is no history of altered sensorium at the time of presentation. No history of discolored urine, vomiting or disturbance in the vision.

From casualty he referred to IMCU and emergency call over was given to us. When we were attending the call over he was in the altered sensorium probably due to hypoxia. Oxygen saturation falls down to 80 %. His face, tongue and neck were edematous. In the casualty itself anaesthetists attempted to intubate him and those attempts were failed.

In a minute the condition got worsened. He became unconscious and went to respiratory arrest. But circulation was normal. Emergency tracheostomy¹⁻⁵ was done and portex cuffed tracheostomy tube

fixed and connected to the ventilator¹⁻⁵ after a brief period of ambu bag support.



Picture shows the patient who had consumed hair dye. Note the cervico facial edema . Tongue was edematous and to prevent tongue bite(bz of altered sensorium) oral airway is placed. Tracheostomy was done and the patient was in ambu bag support.



Picture shows the patient is in ventilator support.

With in 4-5 minutes he regained consciousness but ventilator support was not weaned off. It was decided to continue the ventilator support for one more day. After the patient become comfortable bilateral air entry was checked once again and we handed over the patient to physician for management of medical problems.

On admission all basic investigations were done which was showed normal renal functions. Edema started to get subsided after that. After 6 hours ventilator support was weaned and changed to T piece ventilation. Then T piece also weaned.



Picture shows the patient regained consciousness and facial and neck edema got subsided. Ventilator support was weaned. Picture taken one day after admission.

Then patient was investigated thoroughly to rule out renal and hepatic damages. But renal and hepatic parameters were found to be normal. Forced alkaline diuresis was given to prevent metabolic acidosis. After 3 days patient was normal and transferred to general ward from IMCU.

DISCUSSION:

The first artificial dye was synthesised in the laboratory in 1856. Permanent hair colorants have been in commercial use for over 100 years⁵. Paraphenylenediamine is a coal tar (Paranitroaniline) derivative which, on oxidation produces Bondrowski's base, which is allergenic, mutagenic and highly toxic² and is used to shorten the duration of applications as well as intensify the color of henna (*Lawsonia Alba*) which is traditionally used to color the palms and hair.¹ supravasol is an emerging poison in India⁴. The constituents of this hair dye include PPD 4%, resorcinol, propylene glycol, EDTA, Sodium, liquid paraffin, cetostearyl alcohol, sodium lauryl sulfate, herbal extracts, preservatives and perfumes. Some of the ingredients are known toxins with multi organ effects, while the toxicity profiles of others are not known. The combined effect of individual component may be responsible for significant morbidity and mortality.

The first documented hair dye poisoning in a owner of hair salon was by Nott in 1924. Compound responsible for hair dye toxicity is PPD. PPD imparts black colour to hair dye. It is also used in tattoos and (black) henna. PPD is used because it is cheap, has high temperature stability, high strength, chemical and electrical resistance. Poisoning due to PPD is reported in northern Africa and Arabia due to local custom of using henna (black). A few cases are reported from north India. This poison can be accidental, suicidal or homicidal. It is also used as abortifacient.

Systemic toxicity occurs in two phases.

In phase 1 (acute phase), within four to six hours, numbness and burning of the mouth and throat, epigastric pain, gastritis, persistent vomiting leading to dehydration, angioedema, airway obstruction, blindness, dysphagia, respiratory distress or failure and cyanosis usually occur. Rare manifestations include exophthalmos, optic neuritis and permanent blindness.

In phase 2 (within days or weeks), clinical manifestations include dark urine (a characteristic chocolate or reddish brown) oliguria or anuria, acute tubular necrosis and renal failure, muscle pain, tenderness, rigidity, rhabdomyolysis, intravascular hemolysis and drowsiness. Systemic toxicity occurs in two phases.

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Laboratory features were, raised serum osmolality, ALT, CPK, LDH and urea, and hyperkalemia, methemoglobinemia, hemoglobinemia and metabolic acidosis. Peripheral smear can show anisocytosis and poikilocytosis. Urine analysis can show raised urine osmolality, proteinuria, hematuria, hemoglobinuria, myoglobinuria and albuminuria.

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PPD applied locally can cause contact dermatitis. Transcutaneous absorption of PPD can be rapid and may lead to systemic effects including angioedema, gastro-intestinal disturbances, tremors, drowsiness, convulsions, dyspnea, liver atrophy, acute renal failure, cardiac arrest and death in few cases. However, systemic effects develop following chronic topical application. Chronic dermal exposure can cause lethargy, myalgia, purplish discoloration of gums and teeth, anorexia, GIT disturbances, liver and spleen enlargement, subacute atrophy of the liver, jaundice, CRF, progressive neurological symptoms and coma.

Poisoning due to PPD has high mortality.⁴ Therefore, early recognition can be life saving. There is no specific antidote. The most important aspect of management is early recognition of poisoning by this compound, supportive measures that include gastric lavage with 2% soda bicarbonate and alkalization of urine. Asphyxia is the major early challenge, which may require ventilatory support. Drugs used include hydrocortisone, antihistaminics and vasopressors. Renal support in the form of dialysis is required in ARF.

Mortality does not always depends on amount of dye ingested and tracheostomy¹.

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