



Case report

**Hair dye (super vasmol-33) poisoning – A case report**

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**ABSTRACT**

The trend of consuming hair dyes intentionally to free their souls due to various reasons is increasing markedly especially among rural Indian population. Among them Super Vasmol-33 is a well-known emulsion-base type hair dye brand used for committing suicide. The main content in vasmol is Paraphenylenediamine (PPD). The major toxic effects of this chemical were found to be cervicofacial edema, rhabdomyolysis and acute renal failure. Quick recognition and immediate supportive therapy helps to recover completely. We report a case which highlights the toxic effects upon vasmol ingestion.

**Key words:** Vasmol poisoning, Hair dye poisoning, Paraphenylenediamine

**INTRODUCTION**

One of the widely chosen means of suicide is “Poisoning” [1]. Trend of consuming hair dyes intentionally to free their souls due to various reasons is increasing markedly [1-3] especially among rural Indian population. Super Vasmol-33 is a well-known emulsion-base type hair dye. The main contents in vasmol are Paraphenylenediamine (PPD), liquid-paraffin, sodium lauryl sulphate (SLS), disodium EDTA, propylene glycol, resorcinol, herbal extracts and allowable preservatives [4]. PPD quickens the dyeing manner and so it is used in hair dye preparation. The concentration of PPD differs from 2 to 10% in various branded dyes. The effects of PPD when ingested include edema of cervicofacial region, injury to mucosal layers, respiratory distress, acute renal failure (ARF), rhabdomyolysis and myocardial injury [4]. The hair dye is really cheap and easily obtainable, making it a striking option to commit suicidal [5].

**CASE**

A 28 year old housewife had intentionally consumed super vasmol 33 (a popular hair dye

brand) and was rushed to the emergency ward at 11 AM. She was suspected to have taken 150 ml of hair dye (contains approximately 6 ml of PPD) half an hour before moved to the hospital. Her Blood pressure was 110/80 mm of Hg and pulse rate was found to be 140 beats per minute. Gastric lavage has been performed. She was noted to have remarkable Cervico-facial edema. Hence immediately tracheostomy (image-1) was done and she was connected to a ventilator. Chocolate brown colour urine was observed (image-2) on continuous bladder drainage. Upon performing laboratory investigations, Haemoglobin was 8.4gms %, Platelet count (2.0 lakhs/mm<sup>3</sup>), Total Leukocyte count (TLC) was 16500 cells/mm<sup>3</sup>, ESR was found to be 25 mm/1<sup>st</sup> hour. Biochemical investigations were revealed as follows: Random Blood sugar(RBS) (120 mg/dl), Serum Creatinine(2.0 mg/dl), Blood urea (55 mg/dl), SGOT and SGPT were found as 360 U/L and 240 U/L respectively, Alkaline Phosphatase (160 U/L), Creatinine Phosphokinase (CPK) was 36000 U/dl. Serum Electrolytes examination revealed Hyperkalemia. Symptomatic therapy was initiated with IV fluids (5% Dextrose and Dextrose Normal Saline), Injection Ranitidine 2 ml IV, Injection

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Hydrocortisone 2 ml IM stat and Inj. Chlorphenaramine maleate (CPM) 2 ml IM. Hemodialysis was not preferred as her urine output was normal. After 12 hours her CPK was 15400 U/dl, after 36 hours CPK decreased to 3820 U/dl and serum creatinine was in the normal range. On third day her tracheostomy tube was removed.

With supportive care the patient slowly recovered and was moved to the general medicine ward. She was then referred to the Psychiatrist for counseling and was discharged on sixth day. At the time of follow up, she was completely normal.



**Image-1: Tracheostomy**



**Image-2: Chocolate brown colour of urine**

## DISCUSSION

Ingestion of hair dye as a means of self-harm has been reported widely in various parts of India [1, 2]. The brand Super Vasmol 33 is an emulsion type hair dye which is available for 35 rupees. Para phenylenediamine (PPD) is the main component of vasmol. PPD is a derivative of paranitroaniline. Bondrowski's base is the main product formed which is having allergic, mutagenic and highly toxic properties [3]. Severe edema of cervicofacial region is the main toxicity of the PPD which was evident in our patient. The edema was severe enough to cause respiratory distress, hypoxia, and required an immediate tracheostomy which is lifesaving in such patients [4]. In rats PPD is shown to cause rhabdomyolysis by helping escape of calcium ions from the smooth endoplasmic reticulum initiating in prolonged muscle contraction and irreversible change in muscle structure. In our patient rhabdomyolysis was evident from the chocolate colour of urine [5,6]. Rhabdomyolysis might be serious and if

accompanied with increased CPK levels can have an adverse outcome [7]. In spite of higher CPK and serum creatinine levels initially, our patient responded well to therapy and improved without dialysis. Resorcinol is another toxic content present in vasmol which is a phenolic derivative, and a corrosive chemical. It causes irritation to the skin, eyes and GI membrane [8]. The diagnosis of vasmol ingestion is mainly dependent on clinical manifestations. The clinical features are almost unique in all the patients and in the absence of laboratory facilities in many developing countries the angioedema of neck and face along with hard bulging tongue, the chocolate brown color of the urine can be used for medical diagnosis [9]. Accidental (or) deliberate intake of poison results in systemic toxicity in a dose-dependent manner [10]. Organ injury may be judged by suitable tests for kidney, liver involvement and for rhabdomyolysis. Specific antidote for vasmol poisoning is not available. Therapy is supportive mainly depending on clinical features at the time of presentation. Tracheostomy is a life saving measure

for airway obstructed patients. Steroids and antihistamines are used because of the chance of hypersensitivity reaction due to PPD but there is no proper evidence to support this mode of therapeutic management. Management of the patients depends on the amount of poison consumed and time gap between poison intake and onset of therapy. Dialysis should be opted in patients with severe acute renal failure (ARF) not responding to traditional therapy. Early treatment can prevent renal failure<sup>[11]</sup>. Yet, therapeutic dialysis and supportive treatment can result in thorough recovery in those patients who advanced to renal failure<sup>[12]</sup>.

## CONCLUSION

Common domestic products are being used in the incorrect manner in the society. PPD ingestion is a life risking condition. Clinical results depend on timely recognition, quick referral, and immediate supportive therapy. It is the responsibility of health authorities to prevent the use and trade of PPD in the marketplace. Educating programs about its toxicity have to be conducted at various levels. There is no exact antidote for PPD and therapy is mainly supportive.

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