Case Report
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A rare case of supervasmol poisoning with bradycardia and reversible left ventricular systolic dysfunction

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Abstract

Super vasmol is an emulsion based hair dye commonly used in India. There is no specific antidote for its main ingredient paraphenylene diamine (PPD) and treatment is mainly supportive. Supervasmol poisoning with bradycardia and reversible left ventricular systolic dysfunction is a rare association. The exact mechanism of the cause is not known. We report a case of 45-year-old female who consumed "SUPER VASMOL" for suicidal purpose and developed sinus bradycardia and reversible left ventricular systolic dysfunction which was treated successfully and discharged. Cardiac manifestations were rare and also life threatening. Unless the patient is monitored continuously and prompt treatment instituted, it may prove fatal.

Keywords: Hair dye poisoining, paraphenylene diamine (PPD), reversible left ventricular systolic dysfunction, bradycardia.

KeyMessages: sinus bradycardia and reversible left ventricular systolic dysfunction with hair-dye poisoining

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1. Introduction

Super Vasmol is an emulsion based hair dye commonly used in India. The main ingredients of the dye are paraphenylene diamine, resorcinol, propylene glycol, sodium ethylene diamine tetra acetic acid (EDTA), preservatives, and perfumes. The main compound responsible for the toxicity is paraphenylenediamine (PPD)[1]. PPD available in the form of white crystals when it is pure and rapidly turns to brown when exposed to air. PPD is an oxidative hair dye product[2].Systemic features of PPD poisoning occur in three phases. Phase 1 is an acute presentation with edema of neck, airway obstruction, gastritis and severe vomiting. Phase 2 is a subacute presentation with acute renal failure, rhabdomyolysis and hemolysis. Phase 3 progresses to multiorgan failure[3]. Cardiac complications with hair dye poisoining are rarely reported in literature. Here we report a case of suicidal ingestion of this hair dye, resulting in sinus bradycardia and reversible left ventricular systolic dysfunction.

2. Case History

A 45-year-old female patient alleged of suicidal consumption of 10ml of super vasmol hair dye was admitted in hospital. She had a history of 2 episodes of vomiting, sweating, blurring of vision and loss of consciousness for 10 minutes and throat pain after consumption. No complaint of breathlessness, chest pain, and palpitations. Physical examination revealed pallor with oral and throat congestion. Pulse rate was 86-beats/minute, blood pressure was 110/70 mmHg. Examination of cardiovascular and respiratory system was normal. Oxygen saturation (SpO2) was 98% at room air. ECG was normal. Patient was treated symptomatically with gastric lavage and injection of Hydrocortisone.

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After 12hrs, patient had feeble pulse with rate of 44bpm with no abnormal cardiovascular and respiratory system examination. ECG showed sinus bradycardia with sinus node conduction defect [FIGURE:1]. Immediate echocardiography revealed left ventricular regional wall motion abnormality in left anterior descending & left circumflex artery territories with moderate to severe left ventricular systolic dysfunction. She was treated with injection of Atropine with which sinus rhythm was restored back with appearance of ischemic changes [FIGURE 2].



Figure 1. ECG showing sinus bradycardia.

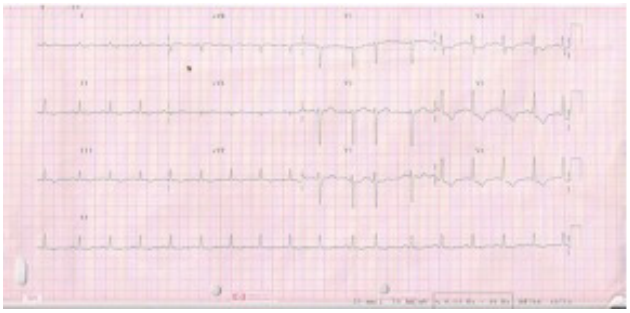


Figure 2. ECG showing correction of bradycardia and appearance of ST-T changes after giving atropine.

Laboratory investigations showed, haemoglobin value of 9.7 g/dl, WBC value of 13,600mm3.Values of electrolytes, renal and liver function tests were normal. Cardiac enzymes values were CK -MB – 38 U/l, CK-NAC – 209U/l. Urine for myoglobin was negative. On day 5, after stabilizing the patient, coronary angiogram was done which showed normal coronaries. Echocardiography done on the day of angiogram revealed no regional wall motion abnormality and no left ventricular systolic dysfunction.

3. Discussion

Paraphenylene diamine is a coal-tar derivative, which on oxidation produces Bondrowski's base, which is allergenic, mutagenic and highly toxic[4].The features of PPD poisoning vary based on its dose of ingestion. The features of poisoning are severe cervico - facial edema, angioneurotic edema, muscular edema, rhabdomyolysis and intravenous hemolysis leading to hematuria and hemoglobinuria resulting in acute renal failure.

Myocarditis is a fatal and commonly neglected complication of hair dye poisoning, due to lack of awareness about this complication in medical community and paucity of data in medical literature. Oral ingestion of supervasmol in doses more than 10 g, is highly cardiotoxic and leads to myocardial damage[5].The clinical features are fatigue, dyspnea on exertion or at rest, chest pain, palpitations, presyncope (feeling of giddiness, faintness) and syncope with non-specific electrocardiographic changes in the form of sinus tachycardia, bundle branch blocks, intra ventricular conduction defect (IVCD), atrial and ventricular premature complexes, atrial fibrillation, ventricular tachyarrhythmia, ST segment elevation or depression and T wave inversion. The patient presented with signs and symptoms of upper airway edema, but myocarditis manifested only after 12 hours. Cardiac manifestations are more common after 12 hours of ingestion[6] This might be related to the biphasic blood clearance of paraphenylenediamine[7] · The half lives were 24 mins and 43.5 hours in animal studies. Initial manifestations are due to direct toxic effect on mucous membranes. Later effects are due to direct effect of toxin on tissues. Cardiac biomarkers suggestive of myocardial necrosis like troponin T/I (more than 0.1 ng/ml) and creatine phosphokinase isoenzyme - MB fraction (CPK-MB) are elevated in most of the cases. Echocardiography reveals wall motion abnormality and decreased left ventricular systolic function (LVEF ≤ 35%), which subsequently improves on follow up. Cardiac dilation in the absence of regional coronary artery disease and evidence of rapid recovery of ventricular function occurs during follow up in some cases. This becomes all the more considering fact that toxin induced bradycardia and reversible left ventricular systolic dysfunction has not been reported in literature.

4. Conflict of Interest

None Declared

5. References

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