

Black Stone Poisoning: A Case Report

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Abstract

Introduction: Paraphenylenediamine (PPD) is the constituent of hair dyes that is responsible for toxicity. Hair dye (PPD) poisoning is associated with high morbidity and mortality and dramatic increase in its incidence has been seen in recent years. We share our experience of a case of complicated PPD poisoning and its management.

Case Description: A 3 year old boy presented to A&E with extensive cervicofacial edema and difficulty breathing for past 6 h. Patient underwent emergency tracheostomy and was kept under mechanical ventilation. Patient responded well to corticosteroids and anti-allergic medications. There was a history of ingestion of hair dye mixed water prior to the onset of symptoms.

Conclusion: Paraphenylene diamine (PPD) (Kala Pathar) poisoning is associated with high morbidity & mortality. It is emerging as a common form of poisoning both accidental and intentional among Asian and African countries due its easy availability and low cost. PPD intoxication can have serious and lethal manifestation that require prompt diagnosis and management. Therefore, we recommend public awareness and education regarding this toxin and early recognition and aggressive airway management.

Keywords: Pesticides; Anemia; Laryngoscopy; Tracheostomy

Introduction

Ingestion or exposure to pesticides is the commonest poisoning encountered in the developing countries. Poisoning due to hair dye intake is evolving as a means of self-harm in various developing countries of Asia and Africa, mortality rates as high as 60% has been reported [1-5]. Paraphenylenediamine (PPD) is the constituent of hair dyes that is responsible for toxicity. Hair dye (PPD) poisoning is associated with high morbidity and mortality and dramatic increase in its incidence has been seen in recent years. Diagnosis is made exclusively on the basis of the history and development of manifestations like cervicofacial edema, black colored urine and muscular pain. The key to effective management is early recognition and aggressive airway management, when necessary. Management protocol includes maintenance of respiratory patency, antihistamines and corticosteroids [6,7].

Here we present a case report of complicated hair dye poisoning where patient presented with extensive cervicofacial edema culminating in multiple unsuccessful attempts at intubation and requiring emergency tracheostomy.

Case Report

A 3-year-old male child presented with complaints of sudden onset difficulty in breathing for 5-6 h along with excessive swelling of mouth and tongue. There was enormous amount of frothy discharge from his mouth. His family gave a history of drinking henna mixed water preparation from a glass 5-6 h before onset of these complaints. It was found that the child's mother had bought "kala pathar" for her hair

dyeing purpose. After finishing dyeing, she had forgotten to throw the amount left in glass. The child added more water to it and drank the water. On examination he was in severe respiratory distress with stridor and deteriorating mental status. There was evident facial and lingual swelling. There was no rash or swelling of other areas of skin. Patient was afebrile, hypotensive and tachycardic with oxygen saturation of 60% on room air. He had no previous history of similar complaints or allergic reactions. His birth history was unremarkable. There was no positive family history of allergic reactions. His immunization was up to date. There was no anemia, jaundice, clubbing, dehydration, lymphadenopathy, edema and cyanosis. Multiple attempts at intubation were failed due to excessive mucosal sloughing and edema. Patient developed cardiac arrest which was reversed by chemical cardioversion. Upon repeated failure to maintain airway, Laryngoscopy was performed, which revealed extremely edematous pharyngeal mucosa, tongue and uvula, vocal cords were normal. No foreign body was identified. Subsequently, emergency tracheostomy was done and post procedure patient was shifted to pediatric intensive care unit. He was started on dexamethasone, H1, H2 blockers and antibiotics. Mechanical ventilatory support was continued. He also required dopamine infusion for 8 h. Liver function test showed raised SGPT which later on resolved. However renal and cardiac functions were normal. The patient had a gradual reduction in facial and tongue swelling. Ventilator parameters were weaned off. Patient had a complete recovery.

Discussion

PPD is emerging as a common means of intentional self-harm in developing countries [3]. Ingestion has been found to be accidental, particularly in children, deliberate and homicidal. PPD is a good

hydrogen donor and is metabolized by electron oxidation to an active radical by cytochrome P450 peroxidase to form a reactive benzoquinone diamine. This is further oxidized to a trimer known as Brandowaski's base, a compound reported to cause anaphylaxis as well as being strongly mutagenic [1]. In order to traditionally apply color to hands, feet and to dye hair which gives a dark red shade it is mixed with the leaves of lawsonia Alba (henna) in Africa, Middle East and Indian subcontinents [4]. Poisoning with PPD, when ingested, presents with severe cervicofacial edema, rhabdomyolysis and intravascular haemolysis leading to myoglobinuria and hemoglobinuria culminating in acute renal failure (ARF) [6,7]. The classic triad of features including angioneurotic edema with stridor, rhabdomyolysis with chocolate colored urine and acute renal failure, whenever encountered in cases of suspected poisoning, should raise the suspicion of hair dye use. [8]. There is no specific antidote to PPD and it is non-dialyzable. It has quite high mortality and aggressive management in collaboration with various specialties especially ENT for the need of early tracheostomy is important. PPD poisoning is a medical emergency, which warrants both a high index of suspicion as well as early management. Standard treatment includes early aggressive fluid therapy, parenteral steroids, antihistamine, antibiotics and oxygen inhalation. Patients should be monitored for respiratory distress and endotracheal intubation has to be performed early if laryngeal edema develops. Furthermore, tracheostomy should be performed in cases with severe sublingual and submandibular edema to keep the airway patent. [7,8] Suliman et al., studied 150 patients who presented with PPD poisoning in Sudan over a 10-year period. Angioneurotic edema was encountered in 68% and emergency tracheostomy had to be done in 15.8%. [2] Shehzad et al., in an audit at Sheikh Zaid hospital concluded that upper airway obstruction secondary to black stone poisoning is emerging as a new indication for emergency tracheostomy [5]. Another study by Aftab et al., at Nishtar Medical Hospital Multan showed that manifestations of local injury like throat pain, dysphagia, dysphonia, cervicofacial edema and stridor were the earliest findings to appear in black stone poisoning as seen in our patient [1]. Tracheostomy, assisted ventilation and hemodialysis were needed in addition to pharmacological measures. A high mortality rate of 20% was observed in the study. 80% of the patients achieved complete clinical and biochemical recovery. PK Jain et al., in his study in MLB medical College, India, saw that out of a total of 1020 cases, 244 (23.92%) cases expired during treatment.

Neck swelling, respiratory distress were the most common symptoms at presentation as in our patient, oliguria, chest pain, palpitation, presyncope/syncope, pain in abdomen, nausea with vomiting, dysphagia and chocolate colored urine were other common symptoms [6].

Conclusion

Paraphenylenediamine (PPD) (Kala Pathar) poisoning is associated with high morbidity & mortality. It is emerging as a common form of poisoning both accidental and intentional among Asian and African countries due its easy availability and low cost. PPD intoxication can have serious and lethal manifestation that require prompt diagnosis and management. Therefore, we recommend public awareness and education regarding this toxin and early recognition and aggressive airway management.

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