

Emerging Trend of Self Harm by Using 'Kala Pathar' Hair Dye (Paraphenylene Diamine): An Epidemiological Study

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ABSTRACT

Objective: To study the demographic profile, clinical manifestations and outcomes in victims of 'Kala Pathar' hair dye (PPD) poisoning attending Medical emergency of a teaching hospital.

Study Design: Observational / descriptive study

Place and Duration of Study: This study was conducted at the Medical Emergency and Indoor Department of District Teaching Hospital Gujranwala from May 2015 to July 2015

Materials and Methods: The total 110 patients with Paraphenylene Diamine poisoning admitted to the District teaching hospital Gujranwala, through the history of the Kala pathar hair dye intake into the A & E room and Medical indoor of Hospital were studied. Conservative treatment & Tracheostomy as a lifesaving measure in all cases (with acute neck and laryngeal edema) was done. Data was analyzed & results were presented in the form of tables & figures.

Results: Total 110 cases of Kala Pathar intake were included in our study out of which 95 were females & 15 were males. Most of the cases belong to age group 11-20 years that were 57 (51.82%) then by 21-30 years of age 34 % and then 31-40 years of age 12 %. 105 (96%) patients were belonging to a lower socioeconomic status and they were from rural areas. Only 5(4%) belonged to urban areas. Suicidal tendencies, involving almost all 110 cases both men and women. Most of the patients had burning, throat and abdominal pain. All Kala Pathar poisoning cases developed angioneurotic edema, dyspnea, and neck swollen strider victim.

ARF was the dose-dependent of the dye and observed in the cases where intake of more than 50 ml. Seventy nine percent (79%) of patients were discharged after well-managed and 24 (22%) died due to complications such as ARF, pneumonia, septic shock. Out of 24 cases who died, 20 (83.33%) were female and 4 (16.67%) were men.

Conclusion: Kala Pathar Paraphenylene diamine poisoning is more common in women with younger age groups, belonging to rural areas associated with high mortality rates. Cases should be diagnosed early, and start management quickly, since no specific antidote is available. The burden of this situation has been increasing, and there is an urgent need for public awareness about the toxic effects of hair dye (PPD). 'Kala Pathar' sale should be restricted by the relevant authorities.

Key Words: Kala Pathar; Paraphenylene Diamine; Hair Dye; Suicide; Intentional Self Injury; Poisoning.

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INTRODUCTION

More than 1 Million deaths per year occur worldwide due to suicides; this ratio is increasing over the past 50 years, especially in underdeveloped countries. About 60% of all suicidal deaths reported in the world may occur in Asia and 40% occur in China, India and Japan due to their large population.¹ The preferred method of self harm is the use of toxic substances that is one of the major problem encountered in the emergency room of many hospitals.

Intentionally self-poisoning causes the vast majority of deaths and puts great pressure on hospital services. The trend of self-harm by the ingestion of the hair dye 'Kala Pathar'(contains the active ingredient Paraphenylene diamine) is emerging in underdeveloped countries and this is related with high mortality^{2,3}

Ingestion of Paraphenylene diamine produces symptoms involving different organs, face, neck, pharynx, tongue & throat initially & its poisoning can cause angioneurotic edema, rhabdomyolysis & ARF. Renal tubular necrosis occurs by toxic metabolites Paraphenylene diamines leading to high mortality rates have also been reported by some authors up to 60% to 68.8% by authors,⁴⁻⁸ The toxicity of Paraphenylene diamine is dose-dependent with an expected lethal dose 7-10 grams.⁹

Paraphenylene diamines composed of highly toxic substances that can inhibit the production of cells, their effect are also on muscles, respiratory system, liver, and kidney & heart system. The toxicity is dependent on the amount of dose. When taken orally, death may occur

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due to angioneurotic edema within 6-24 hours.¹⁰ Despite the high frequency of the cases and the high mortality rate, no antidote is being used for this poison and the cases must be managed conservatively.¹¹ Early diagnosis and supportive care are useful. Cheap and free hair dyes are becoming one of the main causes of suicide in the underdeveloped countries, like India and Pakistan.¹² Most of the reported cases involving young women from 15 to 25 years of age.^{13,15}

Acute hair dye 'Kala Pathar' PPD Poisoning produces affect on upper respiratory tract associated with swollen, respiratory effort and prominence of tongue this may also lead to severe angioneurotic edema. Most of the patients require tracheotomy for airway obstruction^{16,17} PPD can cause cardiotoxicity & hepatotoxicity but a few reports are available about myocarditis, acute MI, ventricular thrombosis & cardiac arrhythmias.

The purpose of this study was to see the demographic profile, clinical manifestations and outcomes in victims of 'Kala Pathar' hair dye (PPD) poisoning attending Medical emergency of a teaching hospital.

MATERIALS AND METHODS

This study was conducted for a period of eight months from May 2015 to July 2015 at Indoor and emergency department of Medicine of District teaching hospital Gujranwala.

Patients with Paraphenylene Diamine poisoning admitted into the medical emergency and medical indoor of the District teaching hospital Gujranwala, through the history of the Kala pathar hair dye intake. Clinical history, active complaints, physical examinations, treatment and outcome was recorded. Gastric lavage was done in a small number of patients. All 'Kala Pathar' poisoning patients undergo steroids treatment while tracheal intubation is attempted in a few cases due to severe neck / laryngeal edema where respiratory obstruction is life threatened; in all these cases the tracheotomy was performed. Forced diuretic was done to avoid ARF due to rhabdomyolysis.

The cases of firearms, hanging, drowning accidental poisoning some other toxins were not included in this study. Victims were hospitalized and divided according to gender, age, residential background, treatment and final outcome. Data was analyzed & results were shown in the form tables & the figures.

RESULTS

Most of the cases belong to age group 11-20 years that were 57 (51.82%) then by 21-30 years of age 34 % and then 31-40 years of age 12 %.(Table No 1)

105 (96%) patients were belonging to a lower socioeconomic status and they were from rural areas. Only 5(4%) belonged to urban areas. (table no 2)

Suicidal tendencies, involving almost all 110 cases both men and women. Most of the patients had burning,

throat and abdominal pain. All Kala Pathar poisoning cases developed angioneurotic edema, dyspnea, and neck swollen strider victim.

ARF was the dose-dependent of the dye and observed in the cases where intake of more than 50 ml. Seventy nine percent (79%) of patients were discharged after well-managed and 24 (22%) died due to complications such as ARF, pneumonia, septic shock. Out of 24 cases who died, 20 (83.33%) were female and 4 (16.67%) were men. (Table No 3)

Table No 1: Age distribution among Kala Pathar Poisoning Cases

Age Groups	No of Cases	Percentages
11-20	57	51.82
21-30	37	34
31-40	13	12
41-50	2	1.81
51-60	1	0.91

Table No. 2: Residential Background of Kala Pathar Poisoning Cases

Residential Background	No of Cases	Percentages
Rural	105	96
Urban	5	4

Table No. 3: Final Outcome of Kala Pathar Poisoning Cases

Gender	No of Deaths	Percentages
Female	20	83.33
Male	4	16.67

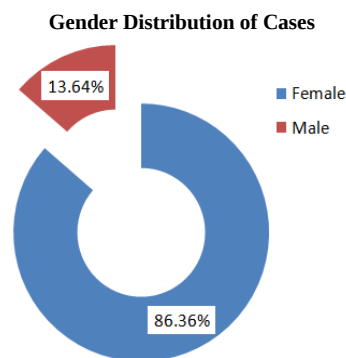


Figure No.1: Gender distribution among Kala Pathar Poisoning Cases

DISCUSSION

Kala Pather contain Paraphenylene diamine the available hair dye is becoming the main cause of suicide poisoning in developing countries involving people with low socioeconomic status and rural residents. It contains potential toxins including Paraphenylene diamine, sodium ethylene diamine tetra acetic acid and propylene glycol leading to multiple organ dysfunctions.

In our study, self-harm by use of PPD is more in the age group of 11- to 30 years with female predominance

of 89%. Akber et al & Anugrah Chrispal et al^{3,4} pointed out similar result just like our study showed about female predominance. Another study was reported by Sakuntala et al¹⁸ that show 80.64% of women predominance and female to male and to female ratio 1: 1.84 has been recorded by Nirmala and Ganesh et al¹⁹. Female predominance is because, this hair dye is low cost & easy available. In addition, women are more exposed to gender inequality & social pressure in underdeveloped countries. In our study patients develop neck swelling with varying degrees of neck edema within range of 3-6 hours. All patients developed angioneurotic edema, strider, and acute airway obstruction and underwent emergency tracheotomy.

An emergency tracheotomy rate 60% was recorded in a study at Multan³ & 87.5% in Nawabshah⁸, but 100% of patients required this procedure to be lifesaving measure in our study. The mortality rate was 21.10% in our study and this ratio is compared with other studies in Akbar et al that was 20% of patients while in a study by Khuhro et al recorded mortality rate 37.5% in their study and 22.58% mortality rate was reported by Jain PK et al²⁰. Another study was carried out by KN et al²³ in DI Khan, which reported mortality rate 47.4% due to PPD hair dye poisoning.

CONCLUSION

Kala Pathar Paraphenylenediamine poisoning is more common in women with younger age groups, belonging to rural areas associated with high mortality rates. Cases should be diagnosed early, and start management quickly, since no specific antidote is available.

The burden of this situation has been increasing, and there is an urgent need for public awareness about the toxic effects of hair dye (PPD). 'Kala Pathar' sale should be restricted by the relevant authorities.

Conflict of Interest: The study has no conflict of interest to declare by any author.

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