ORIGINAL ARTICLE

Paraphenylene Diamine (Kala Pather) Poisoning Experience at Government Mian Munshi Hospital, Lahore

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ABSTRACT

Aim: To assess clinical features and outcome of Paraphenylene Diamine (PPD) Or Kala Pather poisoning at Government Mian Munshi Hospital, Lahore.
Methods: This observational study was conducted at Department of Medicine, Government Mian Munshi Hospital, Lahore from January 2018 to April 2018.Total 24 Cases of PPDPoisoningadmittedto emergency departmentand Medical unit were includedin this study. Their demography, clinicalfeatures and outcome was recorded and assessed.
Results: Out of total 24 patients majority were young female with F:M ratio 11:1. The mean age was20.5 ± 6.24 years. Most of the patients belonged to lower socio-economic status. Suicidalingestion waspredominant causeofPPD ingestion. The earliest clinical features were dysphagia, cervicofacial edema and throat pain . Later on patients developed respiratory difficulty within usually 12 - 24 hours. Rhabdomylysis, acute renal failure, hepatitis, seizures occurred as a delayed complications within a week. As no specific antitdote of PPD poisoningis available, most of patients were treated withsupportivetreatmentand / or immediate tracheostomy. High mortality and morbidity was observed in this study – 12.5%.
Conclusion: PPD (kala Pather) Poisoningis a great hazard associated with high mortality, requires banning its easy availability.
Keywords: Hair dye, paraphenylene-diamine, PPD, myocarditis, angioneurotic edema

INTRODUCTION

In cases of suicide, poisoning is one of the preferred mean of suicide. The most common encountered Poisoning is the ingestion or exposure to pesticide or insectides. PPD (Paraphenylene Diamine) is now emerging as a common means of intentional self-harmin Asia and Africa[1-2]. PPD (Paraphenylene Diamine) is an active ingredient of Kala Pather. It is increasingly reported as a means of poisoningdue to low cost and easy availability[3-4].

PPD is commonly used mixed with Henna which is traditionally applied to color palms and hands and to dye hair giving a dark redshade[5]. PPD (kala Pather) is available in form of stone, powderor liquid.Liquid form of PPDis mostly used for suicide and mortality with liquid form is higher than stone form[6]. Kala pather PPD is not soluble in waterbut is easilysoluble in Hydrogen Per Oxide . It is metabolized to active radical by cytochrome P-450to form are active compound, benzoquininonediamine which is further Oxidized to Bondrowski's base reported to be anaphylactic and mutagenic[7].

PPD poisoning is reported globally, especially in developing and underdeveloped countries.A 11 yearsretrospective study of 374 cases has been published by the poison control center of Morocco, showing PPD beingNo. 1 of the leadingcases of poisoning inMorocco.[8]

Mainingredient of hair dye is PPD which is available in white crystals in pure form and rapidly turns to brown when exposed to air and hence used for hair dyeing.[9]Toxic effect of PPD (Paraphenylene Diamine) are dose related, higher the dose severe are the effects[10]. The exact concentration that causes toxicity is not known. Three grams PPD Causes systemic effects and 7 to 10 grams is the lethal dose[11].

The most common systemic effects of PPD (Kala Pather) poisoning include laryngeal edema, rhabdomyolysis and acute renal failure[11].

The aim of our study is to share experience regarding Kala Pather (PPD)Poisoning and to document its clinical presentation, laboratory finding and outcome in our patients.

METHODOLOGY

This observational study was conducted at Department of Medicine, Government Mian Munshi Hospital, Lahore from January 2018 to April 2018. Total 24 Cases of PPD Poisoningadmittedto emergency department were includedin this study. Their demography, clinical features and outcome was recorded. A proforma was used to collect data about patient's age, sex, personal social status, clinical presentationespecially edema of face, colour of urine, respiratory difficulty etc. Laboratory testsdonewere urinecomplete, blood complete examination, urea /creatinine, CPK, liver function test, electrolytes and glucose. Route of Intoxication (By Mouth, skin) and mode of poisoning (accidental or suicidal) was also noted. Ethical approval from ethical committee was taken.

Diagnosis was based on the historyfrom attendants or patients, clinical features of PPD Poisoning is cervicofacial edema, dysphagia, colour of urine, pain in the throat etc and supplemented by laboratory Investigations. The patients were treated withgastric lavage, I.VSteroids, IV fluids (dextrose and saline) and in some cases sodium Bicarbonate. Tracheostomies were performed insome

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cases, some of these beingelective. Those patients requiring assisted ventilation were put on intermittent mandatory ventilation and pressure support mode.Hospital stay, morbidity and mortalityrates were also recorded.

Collected data was analyzed by using SPSS version 20.Mean and SD was calculated for age and laboratory parameter.Frequencies were calculated for gender and clinical feature.

RESULTS

Total 24 patients were selected for present study.Mean age of the patients was 20.50±6.24 years.Out of total 24 patients 22 (92%) were females and 2(8%) were males with F:M ratio being 11:1 (Fig. 1) Among 24 patents, 20 (83.3%) were unmarried and 4 (16.67%) patients were married. Poisoning was of suicidal intention in 21(87.7%) patients and only 3 (12.5%) were accidental in nature. Oral intake of Poison was noted in 22(91.7%) and skin exposure in 2 (8.3%) only.

The Classical symptoms ofpoisoning were seenwithin four tosix hours of acute poisoning.Dysphagia 91.7% was the most common clinicalfeature found in this study, followed by cervico-facial oedema and throat pain both 87.7%. Oliguria (Anuria) occurred in 58.8% of cases.Acute renal failure was reported in 41.6% of the cases.There was evidence of rhabdomyolysis in the form ofdark urineand muscle ache, was present in 79.3% and 83.3% respectively, while actual reported cases of rhabdomyolysis were79.3%. Hyperkalemia was observed in 66.6% of cases as shownin Table I. Hepatitis developed in 20.8% of our cases. Laboratoryinvestigationsrecorded weremean +SD of TLC, SGPT & CPK were 11440±5325, 678.30±1248, 21.69±11.4 respectively as shown in Table II.

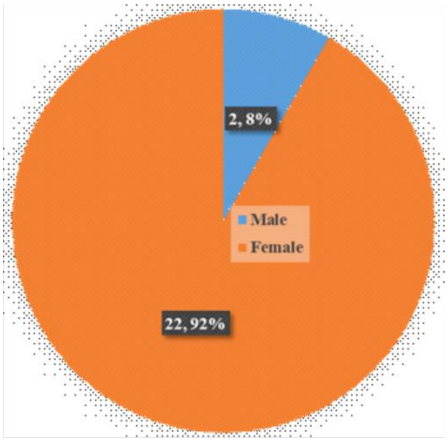
Table I :Clinical Features and outcome of Kala Pather

Clinical feature	N(%)
Cervicofacial edema	21(87.7%)
Dysphagia	22(91.7%)
Difficulty in opening of mouth	21(87.7%)
Pain in the throat	21(87.7%)
Dark urine	19(79.3%)
Muscle aches	20(83.3%)
Rhabdomyolysis	19(79.3%)
Oliguria / Anuria	14(58.8%)
Hyperkalemia	16(66.6%)
Acute Renal Failure	10(41.6%)
Hepatitis	05(20.8%)
HemodynamicShock	03(12.5%)
Mortality	03(12.5%)

Table II: Laboratory Parameters

Laboratory Parameters	**Mean+SD**	**Median/Range**
TLC (1000cells)mm^3	11440±5325	6800/4200-26500
SGPT(U/L)	687.30±1048	85/40-8440
SGOT(U/L)	762.2±835	860/115-5450
CPK(U/L)m1000	21.69±11.4	24.8/1-58
Serum creatinine (mg/dl)	1.6±2.7	1.00/0.4-14

Fig. 1: Gender distribution of patients



DISCUSSION

Paraphenylenediamine (PPD) is one of the commonest constituent of hair dye formulations . It is a Coaltar derivative and is ahighly allergic , mutagenic and very toxic especiallywhen takenorally.Outcome of toxicity is related to the doseof PPD taken . It isemerging as a new trend in self harm poisoning in South Punjab because of low cost and easy availabilityand salty taste rather than bitter one. Majority of patients in our studywereyoung females (91.7%), while Akbar MH [14]and Jains PK et al [11] identified similar age group with female preponderance 27.75 yrs and 23.8±7.8 yrs ,which may be due to our socioeconomic conditions. Most of the patients (76.9%)were from rural area and purpose of PPD ingestion was suicidal (87.7%) . The symptoms of toxicity occurred within four to six hours of ingestion. Instantand proper managementin our intensivecare unitis requiredto deal with lethal complications of PPD (kalapather poisoining). Prompt recognition of symptoms and complications of kalapather poisoning is highly important because no antidote is available. The earliest symptoms were angioneurotic edema of face and neckwith stridor ,dysphagia and throat pain. This leads to respiratory distress that endangers life. Therefore, tracheostomy with endotracheal intubation and assisted ventilation are life saving measures. 76.9%of our patients required tracheostomy while Akbar MA et al[14] showed that 60% of their patients had this procedure[14]. This difference may be due to augmented awareness of healthcare professional to the use of kalapather (PPD) poisoning as a tool of self harm.

Rhabodomyolysis occurred as a delayed complication within a week leading to acute renal failure[12-13].79.3% of our patients developed this complication while Kallel et al noted rhabodomyolysis in all (100%) of their patients [15]. Acute renal failure occurred in 41.6% of our patients while Soni S et al observed this complication in 39.5%[16]. Hyperkalemia was noted in 66.6% in our study and 87.5% bykhuro et al[17]. As no specific antidote of PPD (kalapather) posinoing is available, most of the patients were treated with supportive measures like gastric lavage, antihistamine,

parenteral steroids and alkalinization of the urine, immediate tracheostomy and dialysis etc. High mortality rate was observed in our study(12.5%) while other studies show, 20% at Multan and 21% by Bensalama et el[14,8].

CONCLUSION

PPD (Kala pahter) poisoning is a great hazard associated with high mortality, because of its toxicity, low cost and easy availability. Thereforeit should be banned or strictly regulated by the Government . Awareness programs about its toxicity should be implemented at differentlevelsof healthcare professionals and the society.

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