

Determine the Frequency of Clinical Features, Complications and Outcome in Paraphenylene Diamine Intoxicated Patients Admitted to the Intensive Care Unit

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ABSTRACT

Aim: To examine the clinical presentation, complications and outcomes of paraphenylene diamine poisoning patients admitted to intensive care unit.

Study Design: Retrospective/Observational

Place and Duration of Study: Department of Medicine, Chandka Medical College Hospital, Larkana from 1st October 2019 to 31st March 2020.

Methodology: One hundred and thirty patients of both genders presented with paraphenylene diamine poisoning were enrolled. Patients detailed demographics including, age, sex, clinical presentation and complete blood picture were recorded. Complications and outcomes were examined.

Results: One hundred and sixteen (89.23%) were females while 14 (10.77%) were males. The mean age of patients was 24.52±6.48 years. Suicide was the most common reason of ingestion of paraphenylene diamine found in 92% cases. Cervico-facial edema was the commonest symptom found in 90% cases. Raised creatinine was most common complication found in 60 (46.15%) patients followed by sodium deficiency in 42 (32.31%) and potassium deficiency in 28 (21.54%) patients. 78(60%) patients were recovered, 45(34.61%) were died and 7(5.38%) were LAMA.

Conclusion: Females were high in number in paraphenylene diamine poisoning, suicidal was the commonest reason and Cervico-facial edema was the most common clinical presentation. Mortality rate was 35% while 60% patients were recovered.

Key words: Paraphenylene diamine (PPD) poisoning, clinical features, complication recovered mortality

INTRODUCTION

Paraphenylene diamine poisoning in developing African and South Asian countries is an emerging issue.¹ Paraphenylene diamine is used in the dairy and leather and cloth manufacturing industry. It is often used in small quantities to combine henna to create tattoos over the body.² Paraphenylene diamine hair colours, typically in paste or powder with a developer, are available on the market. Mixed with an oxidizer, it oxidizes and converts the colour into white to black.³ When the colour of the hair colour is dark, it means that PPD is high. PPD is acting as an allergen, causing degranulation of the mast cell, capillary leakage, anaphylactic reactions, and hepatocyte harm.⁴

Several studies have been written regarding fatal intake of PPD-contained hair dye.^{5,6} There are no definite diagnostic criteria and diagnostic testing requires a high degree of suspicion based on extensive history, clinical exams and laboratory research.⁷ Women in Pakistan are commonly involved in rhabdomyolysis and acute kidney injury, flaccid paralysis, severe gastrointestinal manifestations, heart toxicity and arrhythm.^{8,9} The present study was conducted aimed to examine the clinical presentation, complications and outcomes of paraphenylene diamine poisoning patients admitted to intensive care unit.

MATERIALS AND METHODS

This prospective/observational study was conducted at Department of Medicine, Chandka Medical College

Hospital, Larkana from 1st October 2019 to 31st March 2020. A total of 130 adult patients of both genders presented with paraphenylene ingestion were enrolled in this study. Patient's demographics including age, sex and causes and clinical features were recorded. Patients with other than PPD poisoning, patients with history of cardiac issues and surgery, patients who died within 5 hours of PPD ingestion were excluded. Patient's complete clinical examination was done and sign/symptoms were recorded. Complications associated with PPD poisoning were examined. Outcomes in term of mortality and recovered were examined. All the data was analyzed by SPSS 24.

RESULTS

There were 116 (89.23%) were females while 14 (10.77%) were males. The mean age of patients was 24.52±6.48 years. Seventy two (57.69%) patients had rural residential while 58 (44.61%) patients had urban residency. Sixty (46.15%) patients had low socio economic status while 70 (53.85%) had middle social economic status. Suicide was the most common cause of ingestion of PPD found in 119 (92%) cases followed by homicidal in 6 (4.61%) patients, accidentally ingestion found in 3 (2.30%) and 2 (1.54%) patients had unknown causes (Table 1).

According to the sign and symptoms, cervicofacial edema was the commonest symptoms found in 117 (90%) patients, dysphagia found in 100 (76.92%) patients, brown urine in 80 (61.53%) patients, pain of limbs in 76 (58.46%)

patients, respiratory issues in 68 (52.30%) patients, tachycardia found in 37(28.46%), chest pain found in 25(19.23%), hypotension in 20(15.38%), palpitation in 16 (12.30%), anuria in 5 (3.85%), oliguria in 10 (7.69%), convulsion in 6 (4.61%) and nasal regurgitation in 6 (4.61%) patients (Table 2). Raised creatinine was most common complication found in 60 (46.15%) patients followed by sodium deficiency in 42 (32.31%) and potassium deficiency in 28 (21.54%) patients. According to the outcomes, 78(60%) patients were recovered, 45(34.61%) were died and 7(5.38%) were LAMA (Table 3).

Table 1: Demographic information of all the patients

Variable	No.	%
Mean age (years)	24.52±6.48	
Gender		
Male	14	10.77
Female	116	89.23
Causes of PPD ingestion		
Suicide	119	92
Homicidal	6	4.61
Accidental	3	2.30
Unknown	2	1.54
Residence		
Urban	58	44.61
Rural	72	57.69
Socioeconomic status		
Low	60	46.15
Middle	70	53.85

Table 2: Frequency of signs and symptoms

Variables	No.	%
Cervicofacial edema	117	90.0
Dysphagia	100	76.92
Brown urine	80	61.53
Pain of limbs	76	58.46
Respiratory issues	68	52.30
Tachycardia	37	28.46
Chest Pain	25	19.23
Hypotension	20	15.38
Palpitation	16	12.30
Anuria	5	3.85
Oliguria	10	7.69
Convulsion	6	4.61
Nasal regurgitation	6	4.61

Table 3: Complications and outcomes associated with PPD poisoning

Variable	No.	%
Raised creatinine	60	46.15
Sodium deficiency	42	32.31
Potassium deficiency	28	21.54
Outcome		
Recovered	78	60.0
Died	45	34.61
LAMA	7	5.38

DISCUSSION

Poisoning is one of the most common clinical presentation found all over the world with high rate of mortality and morbidity.¹⁰ Paraphenylene diamine (kala pathar) is one of the most common poisoning substance because of its easy availability. In developing/low income countries paraphenylene diamine is widely used for hair dyes, that's

why the incidence rate of paraphenylene diamine poisoning is so high in Asian countries due to easy access.^{11,12}

The present study was conducted aimed to examine the clinical presentation, complications and outcomes of paraphenylene diamine poisoning patients admitted to intensive care unit. In this regard 130 patients presented with PPD ingestion were analyzed. In present study majority of patients were females 89.23% as compared to males 10.77% and the mean age of patients was 24.52±6.48 years. Suicide was the most common cause of ingestion of PPD found in 119(92%) cases followed by homicidal in 6 (4.61%) patients, accidentally ingestion found in 3(2.30%) and 2 (1.54%) patients had unknown causes.

These results showed similarity to many of previous studies in which female patients population was high 70% to 90% as compared to males and the most common age group was 20 to 40 years and majority of patients had suicide intention for PDD ingestion.^{13,14}

In our study cervicofacial edema was the commonest symptoms found in 117 (90%) patients. A study by Tanweer et al¹⁵ reported that cervico-facial edema was the commonest symptoms associated with PPD ingestion patients. We found that dysphagia found in 100 (76.92%) patients, brown urine in 80 (61.53%) patients, pain of limbs in 76 (58.46%) patients, respiratory issues in 68 (52.30%) patients, tachycardia found in 37 (28.46%), chest pain found in 25 (19.23%), hypotension in 20 (15.38%), palpitation in 16 (12.30%), anuria in 5 (3.85%), oliguria in 10 (7.69%), convulsion in 6 (4.61%) and nasal regurgitation in 6 (4.61%) patients. These results were comparable to several previous studies.^{16,17}

In present study we found that electrolyte imbalances were commonly associated with PPD poisoning in which sodium and potassium deficiency were most common and majority of patients had raised serum creatinine which lead to renal failure. Some of patients had cardiac arrest and 10 patients had liver failure. A study conducted by Khaskheli et al¹⁸ reported that electrolyte imbalances were highly associated with PPD poisoning and these complications associated with higher mortality.

We found that 78 (60%) patients were recovered, 45 (34.61%) were died and 7 (5.38%) were leave against medical advice. These results were comparable to many of previous studies in which mortality rate was 25% to 40%.^{19,20}

CONCLUSION

Females were high in number in PPD poisoning, suicidal was the commonest reason and cervico-facial edema was the most common clinical presentation. Electrolyte imbalances were commonly found complications and associated with higher mortality and morbidity. Mortality rate was 35% while 60% patients were recovered

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