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Research Article

**EXAMINE THE FREQUENCY OF ACUTE RENAL FAILURE IN  
PATIENTS WITH PARAPHENYLENE DIAMINE POISONING**Dr Muhammad Junaid Qasim<sup>1</sup>, Asad Rahman<sup>2</sup>, Dr Muhammad Zeshan<sup>3</sup><sup>1</sup>Quaid e Azam Medical College, Bahawalpur, <sup>2</sup>Sheikh Zayed Medical College Rahim Yar Khan,<sup>3</sup>Sheikh Zayed Medical College Rahim yar Khan.**Article Received:** October 2020    **Accepted:** November 2020    **Published:** December 2020**Abstract:**

**Objective:** Determination of the frequency of acute renal failure in paraphenylene diamine (PPD) poisoning patients.

**Study Design:** Retrospective/Observational

**Place and Duration:** The study was conducted in Bahawal Victoria hospital Bahawalpur and Sheikh Zayed Hospital, Rahim Yar Khan for duration of one year from May, 2019 to April, 2020.

**Materials and Methods:** This study enrolled a total of 100 patients of both sexes who received paraphenylene poisoning. Detailed demographics were recorded age, sex and reasons for ingestion of PPD. Clinical presentation has been recorded, including signs and symptoms. Frequency of acute renal failure was examined by serum creatinine mg/dl. Data was analyzed by SPSS 24.0.

**Results:** Out of 100 patients 78 (78%) were females while 22 (22%) were males. The mean age of patients was  $23.98 \pm 7.68$  years. Suicide was the most common reason for poisoning of PPD found in 92 (92%) cases. Cervico-facial edema was the commonest symptom found in 90 (90%) patients. Acute renal failure was observed in 80 (80%) patients. From 80 acute renal failure patients 76 (95%) were recovered after treatment while 4 (5%) patients had residual renal damage.

**Conclusion:** It is concluded that the frequency of acute renal failure was very high in patients with paraphenylene diamine poisoning, but rapid medical treatment helps reduce morbidity and mortality..

**Keywords:** Acute Renal Failure, Paraphenylene Diamine Poisoning.

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**INTRODUCTION:**

Ingestion of PPD triggers various organ dysfunctions. PPD is allergenic and tubulotoxic and causes rhabdomyolysis and angioneurotic edoema, resulting in renal failure[1-2]. Black stone, or chemically referred to as Paraphenylenediamine, is one of women's major suicide facilitators in particular. In 2017, 70 women gave up their lives alone in Punjab using black stone over financial problems, domestic conflicts and societal pressure[3-5]. The black rock that is a strong colouring agent [6] is commonly used in hair dyes and henna. Unfortunately, black stone, commonly known as Kalaa Pathar, is considered the cheapest suicide poison in the aftermath of the recently increased number of suicides [7-8]. What's even more worrying, however, is that anyone can get this PPD at the cheapest price and it's still being sold on the market shamelessly. Reportedly, in the province of Punjab, three people commit suicide every day. Most of the customers are women, belonging to the [9-10] lower or middle class. No one knows, however, that although the chemical has previously been banned and the ban has also been re-imposed, it is still openly sold and accessible to people of all ages, including the younger lot. We need to act as a responsible citizen to overcome the issue and keep an eye on this life. The current study was conducted to examine the frequency of acute renal failure of paraphenylene diamine (Kala Pathar) poisoning in patients.

**MATERIALS AND METHODS:**

This prospective/observational study was conducted at Bahawal Victoria hospital Bahawalpur and Sheikh Zayed Hospital, Rahim Yar khan for duration of one year from May, 2019 to April, 2020.. A total of 100

adult patients of both sexes who had ingested paraphenylene were enrolled in the study. Following written consent from patients/attendants, demographics of patients including age, sex and reasons for ingestion of PPD were recorded. This study excluded patients with non-PPD poisoning, patients with a history of cardiac problems and surgery, patients who underwent renal surgery and patients who died within 5 hours of PPD ingestion.

Complete clinical examination was carried out for patients and signs/symptoms were recorded. Serum creatinine mg/dl was examined for the frequency of acute renal failure. Acute renal failure-related mortality was examined. All the data was analyzed by SPSS 24.0. Mean±SD was done. Frequencies and percentages were recorded in tabulation form.

**RESULTS:**

Out of 100 patients 78 (78%) were females while 22 (22%) were males. The mean age of patients was 23.98±7.68 years. Suicide was the most common reason for poisoning of PPD found in 92 (92%) patients followed by accidental in 4(4%) patients and homicidal in 4 (4%) patients. (Table 1)

According to the sign and symptoms, cervicofacial edema was the commonest symptoms found in 90 (90%) patients, dysphagia found in 76 (76%) patients, brown urine in 74 (74%) patients, pain of limbs in 78 (78%) patients, respiratory issues in 58 (58%) patients, tachycardia found in 30 (30%), chest pain found in 19 (19%), hypotension in 11 (11%), palpitation in 10%, anuria in 2 (2%), oliguria in 7 (7%), convulsion in 4 (4%) and nasal regurgitation in 3 (3%) patients. (Table 2)

Table No 1: Demographics of all the patients

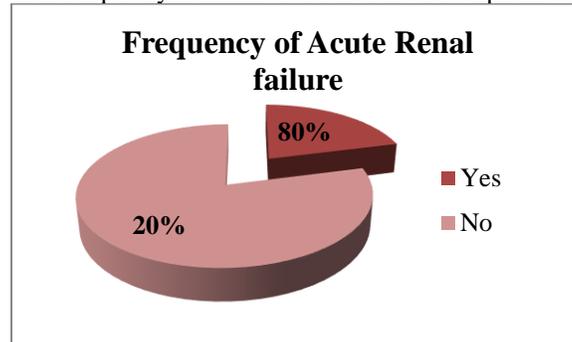
Characteristics	Frequency No.	Percentage
Mean Age (Yrs)	23.98±7.68	
Sex		
Male	22	22
Female	78	78
Reasons of PPD ingestion		
Suicide	92	92
Accidental	4	4
Homicidal	4	4

Table No 2: Clinical presentation of all the patients

Variables	Frequency No.	Percentage
Cervicofacial Edema	90	90
Dysphagia	76	76
Brown Urine	74	74
Pain Of Limbs	78	78
Respiratory Issues	58	58
Tachycardia	30	30
Chest Pain	19	19
Hypotension	11	11
Palpitation	10	10
Anuria	2	2
Oliguria	7	7
Convulsion	4	4
Nasal Regurgitation	3	3

According to the incidence of acute renal failure, we found 80 (80%) patients had acute renal failure. (Figure 1)

Figure No 1: Frequency of acute renal failure in PPD poisoning patients



From 65 acute renal failure patients 60 (92.31%) were recovered after treatment while 5 (7.69%) patients had residual renal damage. No mortality was observed in patients with acute renal failure. (Table 3)

Table No 3: Outcomes of acute renal failure patients (n=80)

Variables	Frequency No.	Percentage
Recovered	76	95
Residual Renal Damage (Serum creatinine >2mg/dl)	4	5

### DISCUSSION:

PPD (C<sub>6</sub>H<sub>8</sub>N<sub>2</sub>), known as stone dye, is the most common and cheapest form of dye available in North Africa and the Middle East and contains the highest PPD concentration (from 70 to 90 percent)[11-12]. Other branded hair dyes contain lower PPD concentrations, typically between 2 and 10

percent[13]. The formation of PPD oxide derivatives such as benzoquinone diimide is responsible for the destruction of muscle cells by a lipid peroxidation membrane mechanism that leads to muscle necrosis and by causing angio-neurotic edoema, myocarditis and rhabdomyolysis, also produces fatal effects on different organs[14-15]. It is becoming a common

mode of self-poisoning in rural areas of Pakistan and India due to its improper handling, easy availability and low cost.

In addition, the absence of a specific antidote is also a matter of concern with respect to its fatal results[16]. 78 (78 percent) were females in our study, while 22 (22 percent) were males. The patients' mean age was  $23.98 \pm 7.68$  years. In 92 (92%) patients, suicide was the most common reason for PPD poisoning found, followed by accidental in 4 (4%) patients and homicidal in 4 (4%) patients. These results were comparable to many studies in which women predominated and the mean age was 24 years[17-18].

In the current sign and symptom study, cervicofacial edoema was the most common symptom discovered in 90 (90 percent) patients, dysphagia discovered in 76 (76 percent) patients, brown urine in 74 (74 percent) patients, limb pain in 78 (78 percent) patients, respiratory problems in 58 (58 percent) patients, tachycardia discovered in 30 (30 percent), chest pain discovered in 19 (19 percent) patients, hypothesis These findings were due to the very high toxicity of PPD secondary to laryngeal edoema development, resulting in decreased air intake, cyanosis development, tachycardia, and hypotension due to myocardial damage. Myocarditis has also been reported in different studies due to hair dye poisoning [18-19].

Acute renal failure was observed in 80 patients (80 percent) in this study. Out of 80 patients with acute renal failure, 76 (95 percent) recovered after treatment, while 4 (5 percent) had residual renal damage. PPD was discovered to be hepatotoxic by various biochemical studies. In their study of hair dye poisoning, Tiwari *et al.* also reported high SGPT/SGOT levels. The overall incidence of renal failure in our study was 58.46%, while other investigators showed more than 70% renal failure.[12,22]

In our study, the mortality rate was 31.67 percent, similar to that reported by other researchers [20-21]. PPD poisoning among young, illiterate and poor people in developing countries, particularly in rural areas, is more pronounced. Health concerns associated with PPD poisoning have been raised by the high morbidity and mortality rate. Intensive care for support, suitable interventions including tracheostomy is the mainstay of management.

### CONCLUSION:

Due to its easy availability, paraphenylene diamine (Kala Pathar) poisoning is increasing day by day and

this will lead to high mortality and morbidity rates. We concluded that the frequency of acute renal failure was very high in patients with paraphenylene diamine poisoning, but rapid medical treatment helps to reduce morbidity and mortality.

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