



## PARAPHENYLENE POISONING AND ITS COMPLICATIONS

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### ABSTRACT

**Objective;** To determine the various complications associated with Paraphenylene poisoning. **Methods;** In this study 50 cases of Paraphenylene poisoning were included on non-probability consecutive sampling. The cases were selected irrespective of gender and age group. The study was done at Department of Medicine Sheikh Zayed Hospital, Rahim Yar Khan during January to June 2018. These cases were followed for 48 hours and extensive clinical examinations, investigations and ECG done to look for various complications associated with it. **Results;** Out of the 50 cases in the present study, there were 33 (66%) females and 17 (34%) males. The mean age of the cases was  $27.34 \pm 4.57$  years and mean duration of poisoning was  $5.67 \pm 1.03$  hours. Complications were seen in 44 (88%) of the cases with overlapping of complications in most of the cases having one or more of it. The most common one was dysphagia seen in 38 (76%) of cases followed by hyperkalemia in 28 (56%) and maxillofacial edema in 22 (44%) of the cases. Renal failure and arrhythmias were seen in 28% and 32% of cases. **Conclusion;** Paraphenylene is a highly morbid condition and the most common one is dysphagia.

**KEYWORDS:** PPD, Dysphagia, Arrhythmias.

### INTRODUCTION

The number of suicides is increasing all across the globe in the recent times and in last fifty years this number has almost doubled and is responsible for around a million of deaths.<sup>[1]</sup> The most number of the cases are seen in the under-developed countries and especially in Asian countries.<sup>[2]</sup>

There are a number of steps that are taken and maneuvers done to commit suicide. Fall from the buildings, cutting the major vessels and a wide range of intoxications are the most common deployed methods. Among the commonly used agents, Paraphenylene Diamine also known as PPPD, narcotic drugs, acetaminophen, wheat pills, acids, alkalis etc. are the salient ones.<sup>[3]</sup>

PPD is a very cheap and easily available hair dye and is metabolized by cytochrome P450 system leading to its oxidation and ending up in a very toxic product that can escalate different types of reaction and even anaphylaxis.<sup>[4,5]</sup> It is highly toxic and can impact any organ of the body. The most common complications are maxillofacial edema, dysphagia, hepatitis or renal failure, arrhythmias etc.<sup>[6-8]</sup> The data has shown that higher the dose and poor the outcome and the high degree of fatality is due to absence of the specific antidote for this.<sup>[9-10]</sup>

### OBJECTIVE

To determine the various complications associated with Paraphenylene poisoning.

### MATERIAL AND METHODS

In this study 50 cases of Paraphenylene poisoning were included on non-probability consecutive sampling. The cases were selected irrespective of gender and age group. The study was done at - Department of Medicine Sheikh Zayed Hospital, Rahim Yar Khan during January to June 2018. These cases were followed for 48 hours and extensive clinical examinations, investigations and ECG done to look for various complications associated with it.

### Statistical analysis

SPSS-23 was used to assess the data and post stratification Frequency and percentages were calculated for nominal while mean and standard deviation for numerical data.

### RESULTS

Out of the 50 cases in the present study, there were 33 (66%) females and 17 (34%) males. The mean age of the cases was  $27.34 \pm 4.57$  years and mean duration of poisoning was  $5.67 \pm 1.03$  hours as in table I. Complications were seen in 44 (88%) of the cases with overlapping of complications in most of the cases having

one or more of it. The most common one was dysphagia seen in 38 (76%) of cases followed by hyperkalemia in 28 (56%) and maxillofacial edema in 22 (44%) of the cases. Renal failure and arrhythmias were seen in 28% and 32% of cases (table II)

**Table I. Study variables (n=50).**

	Mean	Range
Age	27.34±4.57	12-57 years
Weight	47.78±10.23	22-88 kg
Duration of poisoning (hours)	5.67±1.03	1-24 hours
	No.	%
Male	17	34%
Female	33	66%

**Table II. Complications of Paraphenylene poisoning (n=50).**

Complications	No.	%age
Renal failure	14	28%
Arrhythmia	16	32%
Hepatitis	7	14%
Dysphagia	38	76%
Hyperkalemia	28	56%
Maxillofacial edema	22	44%

## DISCUSSION

Paraphenylene Diamine is a hair dye which is easily available over the counter and is being recently used for suicide in the recent times in the developing countries and have shown a very high degree of morbidity and mortality. There is no specific antidote to it and it can virtually damage any organ of the body.

In the present study there were 33 (66%) females and 17 (34%) males that presented with PPD poisoning. This was also seen by many studies that females were more common to ingest this poison and their ration is usually 2:1 to 3:1. This can be explained by the reason that its easily available at home and also by the factor that females are more vulnerable to the surrounding pressures and commit suicide.<sup>[7,11]</sup>

In the present study all cases presented with suicidal ingestion of the PPD and this was also proved by the study done by Nirmala et al and Khan et al where they revealed that more than 90 to 95% of have suicidal attempt and accidental intake is very scarce.<sup>[8,12]</sup>

Complications were seen in 44 (88%) of the cases with overlapping of complications in most of the cases having one or more of it. The most common one was dysphagia seen in 38 (76%) of cases followed by hyperkalemia in 28 (56%) and maxillofacial edema in 22 (44%) of the cases. These results were in line by the previous studies from Pakistan and according to a study done by Khuhro et al overall complications were seen in all 100% of their 16 cases.<sup>[13]</sup> Kellel H et al, study and Prabhakaran AC et

al n their also described the similar percentage and found dysphagia and maxillofacial edema as most common after oral ingestion.<sup>[14-15]</sup> Hyperkalemia in high number of cases was attributed to rhabdomyolysis that is resulted due to toxic injury of this substance to the muscular system and this was also supported by the results of the study done by Tiwari D et al where hyperkalemia was seen in 38% of their cases as compared to 56% in the present study.<sup>[16]</sup>

## CONCLUSION

Paraphenylene is a highly morbid condition and the most common one is dysphagia.

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