ORIGINAL ARTICLE

Paraphenylene Diamine Poisoning Among Females in Nawabshah: A Reterospective Study From 2013 to 2015

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ABSTRACT

Objective: This study aims to determine the frequency of paraphenylene diamine poisoning in Nawabshah and its outcomes.

Study Design: Retrospective Study.

Place & Duration: Surgical Intensive Care Unit at Peoples University of Medical and Health Sciences for Women, Nawabshah from January 2013-December 2015.

Materials and Methods: We extracted the data from the medical records of Surgical Intensive Care Unit at Peoples University of Medical and Health Sciences for Women, Nawabshah over a period of 3 years (January 2013-December 2015). A retrospective review of all records of females with PPD poisoning was conducted and the relevant information was extracted. Variables under study were age and outcome (expired, cured, and referred). Information on post-referral state of the patient was neither obtained nor documented in the medical records. Categorical variables were presented as frequencies and percentages whereas continuous variables were presented as mean±SD.

Results: During the three years (January 2013-December 2015), we had a total of 235 cases of females with PPD poisoning reported in our hospital. The age of study population in our study was 24.47±9.88 years. In context to the outcomes, there were 54.9% patients cured and 38.3% cases expired during three years.

Conclusions: We found that female youngsters use paraphenylene diamine as a poison for committing suicide. It should be ensured that the access to paraphenylene diamine be restricted and kept distant from young generation particularly females.

Key Words: Females, Paraphenylene diamine, PPD, Poisoning, Trend, Women.

INTRODUCTION:

Paraphenylene diamine (PPD) or black stone has been used for suicidal attempts in the developing world and has been reported as a source of poisoning in Asian and African countries.[1] While rarely used in the western world, PPD is a common component of hair dye formulations in South Asia, Middle East and East Africa.[2,3] Its concentration in hair dye preparation for darkening the hair color varies between 70%-90% and 2-10% in stone hair dye and branded dyes respectively.[4] Moreover, PPD has Widely been used for cosmetic and industrial purposes in the world.[5]

PPD yields an intermediate, Bandrowski's base, on oxidation which is a highly toxic compound and a well-known mutagen and carcinogen.[6] However, the systemic side effects produced by PPD are dose-dependent and based on potential of individual susceptibility.[7,8] It has potential to damage multiple systems of the body including respiratory, renal, muscular, and integumentary systems consequently resulting into increased reports of mortality rates.[5,7]

Several studies from Saudi Arabia, India, Khartoum, Sudan, Casablanca, Morocco and Pakistan have reported cases of PPD poisoning.[9,10] According to a study by Mohamed Abdelraheem et al., mortality rate from PPD poisoning was between 12-42% while it was between 0.03-60% in another study.[1,5] Previous researches have reported that the PPD poisoning is common in young people particularly aged between 15-35 years with a higher proportion from females.[11] To date, there is not any

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antidote for PPD poisoning and it is managed conservatively, with increased mortality rate within 24 hours of consumption. Recently, few studies have been conducted in Pakistan on PPD poisoning[11, 12] but they were general and did not particularly address female youngsters however, this study aims to be specific to female population reported for the cases of PPD poisoning and give description of the outcomes of those cases.

MATERIAL & METHODS:

We extracted the data from the medical records of Surgical Intensive Care Unit at Peoples University of Medical and Health Sciences for Women, Nawabshah over a period of 3 years (January 2013-December 2015). A retrospective review of all records of females with PPD poisoning was conducted and the relevant information was extracted. Data on children, males and other causes of poisoning was excluded from the study. Variables under study were age and outcome (expired, cured, and referred). Information on post-referral state of the patient was neither obtained nor documented in the medical records.

Moreover, all the patients were initially managed at the Department of Medicine and then shifted to Surgical Intensive Care Unit. Since there is no antidote for this poison, all the cases were managed conservatively including correcting fluid and electrolyte imbalance, blood pressure control and nutritional support. All the managed cases after stabilization of the patient, were shifted to the wards of Department of Medicine. This study was appro-ved by the institutional ethical committee for publishing the results.

The data extracted from medical records was transferred to Microsoft Excel 2007 Spreadsheets and analyzed on SPSS version-20. Categorical variables were presented as frequencies and percentages whereas continuous variables were presented as mean±SD.

RESULTS:

During the three years (January 2013-December 2015), we had a total of 235 cases of females with PPD poisoning reported in our hospital. The age of study population in our study was 24.47±9.88 years (range: 1-70 years) [Table: 1].

Table-1: Comprehensive Overview of Study Variables

Study Variables		Frequency	Percentage
Total Number		235	100
Age* (years)		24.47+9.88 (Range:1-70)	
Outcome	Cured	129	54.9
	Expired	90	38.3
	Referred	16	6.8
*Age is displayed in mean±SD			

DISCUSSION:

Poisoning is the most common method of committing suicide in Asian countries with the use of various methods due to immense variation in social, religious, cultural, and economic backgrounds in this region.[13,14] In the recent years, prevalence of the cases of PPD poisoning have significantly increased with major contribution from young females. Easy access to the poison, family issues and conflicts, employment issues, social and emotional problems, low socio-economic status, and conflicts related to marriage might be the most likely factors for such an increase in the cases of PPD poisoning.[15]

During the three years i.e. January 2013-December 2015, we had a total of 235 cases of females with PPD poisoning (out of 431 total cases for both genders) reported in our hospital yielding a contribution by females to approximately 54.5%. Anugrah Chrispal et al., in their study, reported female predominance (11 out of 13).[16] In another study, females contributed to 64.8% with the female and male ratio of 1.84:1.[9] Two recent studies reported this poisoning in young girls.[17,18] In an eleven years study (1992 to 2002) of Ayoub Filali et al., out of over 374 cases, there was majority of females (77%) aged between 15-35 years (69.5%) with 78.1% of intentional cases of

poisoning.[19] Moreover, female dominance in the study by M. Hamdouk was 80.7%, by Ayoub Filali et al., was77% and by PK Jain et al. was 74.86%.[17,19,20]

The age of study population in our study was 24.47±9.88 years (range:1-70years). Anugrah Chrispal et al., in their study, identified similar age group (27.75 years) for the cases of this poisoning.[16] Moreover, PPD poisonings was observed among young people aged between 15-24 years.[19] These findings corroborated with previous study with mean age of 24.75 years of the study population.[9]

In context to the outcomes, there were 54.9% patients cured and 38.3% cases expired during three years. In a previous study, the mortality rate due to PPD poisoning was 42% with all deaths occurring within 24 hours of diagnosis.[21] In a study from Nawabshah, Abdul Rahim et al., reported mortality rate as 7.9%.[11] Moreover, in an 11 year retrospective study, Ayoub Filali et al., reported 21.1% mortality rate.[19] Similarly, there was 14.7% and 16% mortality rate in the cases of PPD poisoning reported by H Rebgui et al., and Sawsan A Shalaby et al., respectively.[22,23] This variation in the mortality rates may be attributed to the difference in the duration of the study, variation in sample size and the type of methodology used, geographical variation, and dependent on the amount of poison consumed and speed of management.

CONCLUSION:

We found that female youngsters use paraphenylene diamine as a source of poison for committing suicide. It should be ensured that the access to paraphenylene diamine be restricted and kept distant from young generation particularly females.

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