ORIGINAL ARTICLE

TWO YEARS ANALYSIS OF ACUTE POISONING IN PATIENTS PRESENTED TO EMERGENCY DEPARTMENT OF AYUB TEACHING HOSPITAL, ABBOTTABAD

Salma Shazia, Muhammad Junaid Khan*, Haroon ur Rashid, Amjad Farooq***, Muhammad Umair, Subhan Ullah Syed**

Department of Forensic Medicine, *Department of Community Medicine, Ayub Medical College, Abbottabad, **Women Medical College, Abbottabad, ***Ayub Teaching Hospital. Abbottabad-Pakistan

Background: Acute poisoning is one of the most common causes of poisoning worldwide and is the fourth leading cause of death. It is either accidental or suicidal and causes a high mortality and morbidity. It is more common in males due to prolonged occupational exposure. The objective of this study is to find the pattern of acute poisoning and its relation with demographic variables in the emergency department of Ayub Teaching Hospital, Abbottabad. **Methods:** This cross-sectional study was carried out on patients of acute intoxication brought to the emergency department of Ayub Teaching Hospital in the year 2017-18. Data was analyzed by SPSS-16.0 and presented as tables and figures. Chi-square test was applied at 5% level of significance. **Results:** A total of 76 patients, 48 (63.16%) females and 28 (36.84%) males were included during the period. Mean age was 24.12±9.058 years. Thirty-nine (51.32)% cases belonged to rural areas and 37 (48.68)% were from urban areas. Cases of medicinal poisoning were 25 (32.89%) followed by 19 (25%) cases of organophosphate poisoning. Most cases of poisoning 36 (47.4%) were presented in the night shift. Thirty-one (40.79%) cases were brought to the hospital within 1–2 hours of incident. Cases of intentional poisoning were 51 (67.11%) while 25(32.89%) were due to accidental poisoning. **Conclusion:** Females within the age group 21–35 belonging to rural areas were more prone to poisoning. The common type of poisoning is medicinal poisoning. Most patients were presented to the emergency in the night shift within 1–2 hours of intoxication.

Keywords: Poisoning, Emergency, Alcohol, Organophosphates

Citation: Shazia S, Khan MJ, Rashid H, Farooq A, Umair M, Syed SU. Two years analysis of acute poisoning in patients presented to Emergency Department of Ayub Teaching Hospital, Abbottabad. J Ayub Med Coll Abbottabad 2020;32(Suppl. 1):628–32.

INTRODUCTION

Poison is "any substance or medicine which act chemically and consistently to cause disturbances of both physiology and biochemistry of an individual, culminating into illness and even death."[1] Legally poisoning refers to the intent with which a substance is given to a person. Medicolegally, human poisoning is classified into four main classes, i.e., suicidal, homicidal, stupefying and accidental poisoning. Stupefying poisons are mostly used to gain some interests from the person e.g. for robbery, sexual assaults etc. Accidental poisoning mostly occurs in children and adults due to carelessness in handling/storing poisonous substances in food containers.[2] Snake and scorpion bites also come under accidental poisoning.

Medically, poisoning is of two types; acute and chronic. Acute poisoning is due to short term (less than 24 hours) exposure to a toxic substance. It is either accidental or suicidal and its exposure can cause a high rate of mortality and morbidity worldwide. All such cases of poisoning are Medico-legal cases; cause of injury or ailment in which investigations by the law-enforcing agencies are essential to fix the responsibility regarding the causation of the injury or ailment.[3]

Poisoning mostly depend on factors like geography, accessibility, availability, socioeconomic conditions, cultural and religious influences.[4]

The incomplete epidemiological data on poisoning in Pakistan is the reason behind an underdeveloped poison information surveillance system. However the pattern of poisoning differs like suicidal poisoning is common in teenagers while accidental poisoning is more common in children and in adults working in different industries.[5] The data about homicidal poisoning is very less. The reason is that most of the cases either go unreported or other modes like firearms for homicide are preferred.

In a research done by Khan *et al*, among 233 patients of acute poisoning, half of them came with suicidal intention, 68% were males, 54% were aged 19–44 and 19% were children and adolescents (<18 years). Types of poisoning included chemical/gas (43.8%), drug/medicine (27%), alcohol (16.7%) and food/plant (6%).[6] Reasons like impulsive behaviour due to broken families, study

stresses, competitions in life, failure in love, professional dissatisfaction is the cause of the large number of poisoning in young population.[7,8] Suicidal poisoning was found more common in Tanzania.[9]

Accidental poisoning is an important cause of morbidity and mortality in the world. According to WHO in 2016, 106 683 deaths occurred worldwide.[10] It is more common in young children both in developed and underdeveloped countries.[11,12] In Pakistan it is the fifth leading cause of childhood poisoning.[13] The reason could be children's curious nature, or negligence on the part of parents in keeping poisonous substances openly.[14] It is important to identify the epidemiology of accidental poisoning in children for adequate prevention.[15] 42.6‰ cases of intoxication occurred in children aged <6 years old in 2.2 million cases reported by 55 of Antitoxic Centers from the United States in 2014.[10] According to a study done in British Columbia during 2008-13, 57% of poisoning hospitalizations were the result of self-harm, while one-third (32%) were classified as accidental.[16]

It is very important to know and get an overall picture of acute poisoning cases in Abbottabad division. Only then, it will be possible to get prepared for incoming cases at emergency department. The purpose of this research is to find incidence, pattern and the common cause of acute cases of poisoning among the patients presenting in emergency department of Ayub Teaching Hospital, Abbottabad.

MATERIAL AND METHODS

This cross-sectional study was conducted in the Emergency Department of Ayub Teaching Hospital (ATH), Abbottabad from December 2018 to May 2019. Based on Non-probability consecutive sampling all patients with acute poisoning who came to the emergency department were included in the study. Patients whose record was not available and/or who were brought to the same department for the reasons other than poisoning were excluded from this study. A structured questionnaire was developed including all the variables of interest. Study protocol was also approved from institutional review board of the same hospital.

Secondary data was collected by eight students on the questionnaire from 1st Jan 2017 to 31st Dec 2018. Data was analyzed using SPSS version 16.0. Continuous variables like age were analyzed by mean and standard deviation and categorical variables e.g. mode of poisoning, type of poisoning, time of admission etc. were analyzed using frequencies and percentages. Outcome variables such as mode of poisoning, type of poisoning and time of arrival in the hospital were stratified against gender, age and residence. Post-stratification Chi-chart test was used and *p*-value of <0.05 was taken as significant. Data was presented in the form of tables and graphs.

RESULTS

From 2017-18, a total of 76 (100%) cases, with male 28 (36.84%) and 48 female (63.16%) of acute poisoning with mean age of 24.12±9.058 years was analyzed from Emergency Department of Ayub Teaching Hospital, Abbottabad. This gives a male to female ratio of 1:1.71.Thirty-nine (51.32%) cases were from urban areas and 37 (48.68%) from rural areas (Table-1).

Among type of poisonings, majority of cases, 25 (32.89%) were of medicinal poisoning and only 2(2.63%) belonged to corrosive poisoning. Most patients were brought to the emergency at night shift 36(47.37%) and within 1–2 hours of intake 31 (40.79). Cases of intentional poisoning were 51 (67.11%). (Table-2).

Figure-1 highlight that drug misuse was most common among females, i.e., 20 (41.7%). Cases of corrosive poison were the same in both genders. Alcohol was found in 13 (46.4%) males and organophosphates among females 15 (31.2%) were more common with statistically significant difference. Table-3 shows poisong types by independent variables. Table-4 shows intentional poisong by age, gender and residence.

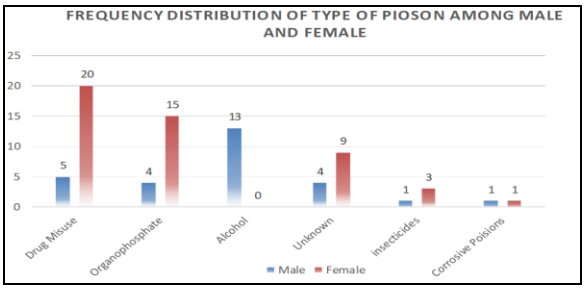

Figure-1: Frequency distribution of type of poison among male and female

Table-1: Demographic variables of analyzed cases of acute poisoning.

Variable		Frequency	Percent
Gender	Male	28	36.84
	Female	48	63.16
Residency	Urban	39	51.32
	Rural	37	48.68
Age group	< 20	23	30.26
	21–35	47	61.84
	36–50	4	5.26
	>51	2	2.63
Total		76	100

Table-2: Different characteristic of cases of acute poisoning.

Variables		Frequency	Percent
Type of poisoning	Medical poisons	25	32.89
	Organophosphate	19	25
	Alcohol	13	17.11
	Unknown poison	13	17.11
	Insecticide poisons	4	5.3
	Corrosive poison	2	2/63
Arrival in hospital	Morning shift (8:00am-2:00pm)	10	13.16
	Evening shift (2:00pm-8:00pm)	30	39.47
	Night shift (8:00pm-8:00am)	36	47.37
Duration after ingestion	< 1 hour	17	22.37
	1-2 hours	31	40.79
	3-4 hours	20	26.32
	>4 hours	8	10.53
Cause of poison	Intentional	51	67.11
	Accidental	25	32.89
76	100		

Table-3: Distribution of different types of poisons among different independent variables.

	Type Of Poison						Total	*p*. Value
	Organophosphate	Alcohol	Medicine	Insecticide	Unknown	Corrosive		
Gender								
Male	4 (14.3)	13 (46.4%)	5 (17.9)	1 (3.6%)	4 (14.3%)	1 (3.6%)	28 (100.0%)	0.00
Female	15 (31.2%)	0 (0.0%)	20 (41.7%)	3 (6.2%)	9 (18.8%)	1 (2.1%)	48 (100.0%)	
Age Group (In Years)								
<20	6 (26.1%)	3 (13.0%)	8 (34.8%)	1 (4.3%)	5 (21.7%)	0 (0.0%)	23 (100.0%)	
21 To 35	13 (27.7%)	6 (12.8%)	16 (34.0%)	2 (4.3%)	8 (17.0%)	2 (4.3%)	47 (100.0%)	0.193
36-50	0 (0.0%)	2 (50.0%)	1 (25.0%)	1 (25.0%)	0 (0.0%)	0 (0.0%)	4 (100.0%)	
> 50	0 (0.0%)	2 100.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (100.0%)	
Residency								0.538
Urban	8 (21.62%)	8 (21.62%)	13 (35.13%)	3 (8.10%)	4 (10.81%)	1 (2.70%)	37 (100%)	
Rural	11 (28.20%)	5 (12.82%)	12 (30.76%)	1 (2.56%)	9 (23.07%)	1 (2.56%)	39 (100%)	
Total	19 (25.0%)	13 (17.1%)	25 (32.9%)	4 (5.3%)	13 (17.1%)	2 (2.6%)	76 (100.0%)	

Table-4: Gender and age-wise distribution of poison cases against cause of poisoning

		Causes Of Poisoning		Total	*p*. Value
		Intentional	Accidental		
Gender	Male	19 (67.9%)	9 (32.1%)	28 (100%)	0.915
	Female	32 (66.7%)	16 (33.3)	48 (100%)	
Age Group (Years)	<20	14 (60.9%)	9 (39.1%)	23 (100.0%)	0.678
	21 To 35	32 (68.1%)	15 (31.9%	47 (100.0%)	
	36 To 50	3 (75.0%)	1 (25.0%)	4 (100.0%)	
	>51	2 (100.0%)	0 (0.0%)	2 (100.0%)	
Residency	Urban	25 (67.6%)	12 (32.4%)	37 (100.0%)	0.930
	Rural	26 (67.1%)	13 (33.3%)	39 (100.0%)	
	Total	51 (67.1%)	25 (32.9%)	76 (100.0%)	

DISCUSSION

Poisoning at any age is a major public health problem in developing countries. Poisoned patients need quick evaluation and appropriate management to ensure best possible outcomes. All cases of acute poisoning are brought to the emergency initially where the patients get a first-line treatment. However, better preventive and management strategies need to be developed if the incidence and pattern of acute poisoning are known.

In this study, female cases of acute poisoning were more than males. This female preponderance appears to be due to increased stress and strain and also being more prone to mental illnesses which lead them to intentional poisoning. Jiang et.al states the male preponderance as males accounted for a majority of poisoning deaths (66%).[16] Goksuetal in 2002, reported that the percentage of women in acute intoxication cases was 64.3% and deliberate ingestion was noted in 78.7%.[17] According to the 35th annual report of National Poison Data System (NDPS) America, females comprising the majority of reported exposures.[18] Similarly, in a study done in British Columbia, females of all ages predominate the males in Self-harm poisoning hospitalization.[16] According to another study

conducted in Peshawar by Muhammad *et al* reported that 63.1% females were found involved in acute poisoning cases which are consistent with the results of this study. The reason might be that females are more prone to negative cultural influences and domestic stresses as compared to males.[7,19] Similar results were found in America by Prosser JM, stating the highest emergency department visits by females age 15 to 19.[20] Previous studies also showed that females chose poisoning as mode of suicide as compared to other causes of self-harm.[21]

In this study, mean age of all cases is 24.12±9.058 years with most commonly affected age group 21–35 years. Both intentional and accidental type of poisoning was common in it. People in this age group are more exposed to medicines, alcohol, and certain chemicals and may also have occupational exposure. Bhoopendra Singh in 2006, reported that majority (36%) of cases affected by acute intoxication were from the age group of 21–30 years.[22] This is very close to the current study. However, Jiang *et al* suggests that individuals between the age of 15 to 64 are more at risk.[16]

In this study, 51.32% of the patients belonged to rural areas while 48.68% were from urban areas. This shows that acute intoxication is more common in rural areas. Probable reason is increased use and easy availability of pesticides in farming makes the people more prone to acute intoxication. Batra AK *et al* in 2003 reported that young males of rural background with agricultural occupation and failure of monsoon are at risk of poisoning.[23] Moreover, this study found medicinal poisoning as most common with a total of 25 cases. This acute intoxication may be due to adverse effects of medicinal agents or deliberate self-poisoning. Keith Hawton reported that analgesics, antipyretics and antipsychotic drugs are most commonly used by both genders and accounted for three-quarters of all admissions.[24]

On further analysis of data, the time interval in which most of the cases (36 out of 76) under study were brought to the emergency during night shift from 8 pm to 8am. It is probably due to the fact that most of the intentional poisoning cases leading to suicides as well as accidental cases such as snake bites mostly occur at night. In addition to this, 31 out of 76 cases, were brought to the emergency within 1 to 2 hours of intoxication. The main reason for this quick arrival at the emergency was that most of the patients were from nearby or the peripheral areas of the same district and have easy access to transport. Cases of remote area might have been missed and strategies are needed to find their incidence.

About mode of poisoning in present study, most cases (51 of 76) were intentional. The rate of suicide attempts through intentional poisoning is increasing day by day and is becoming an important health concern. Prosser JM stated that the incidence of self-harm poisoning rose from 75 per 100,000 in 2002 to 94 per 100,000 in 2003 while the incidence remained relatively steady in 2004.[20] The rapid rise in intentional poisoning may be due to increasing incidence of mental illnesses in the present era and also the tolling stress associated with a certain age group.

It is clear now that as fatal as poisoning might be, the mortality rate can be reduced considerably by the cautious use, safe storage of chemicals and pesticides and also taking preventable measures during occupational exposure. The drugs prescribed should be used adequately and carefully. Psychiatric help should be sought for deteriorating mental conditions. This will considerably reduce the incidence of intentional, accidental and occupational exposure to poisons.

The strengths of the study are that reliable secondary data was analysed in our setup. Limitations are that it was a small sample size and retrospective collection of data.

CONCLUSION

Females within the age group 21-35 belonging to rural areas were more prone to poisoning. The common type of poisoning is medicinal poisoning. Most patients were presented to the emergency in the night shift within 1-2 hours of intoxication.

RECOMMENDATIONS

- The need to establish awareness and guide programs about poisoning in the mass media, and teaching the general population about first aid measures in poisoning cases especially in remote areas.
- Assuring provision of antidotes and essential supplies for the treatment of poisoned patient in hospitals.
- Poison control centres should be made with 24hrs telephonic service available, in the country.

AUTHORS' CONTRIBUTION

SS: Conception, study design, write-up. MJK: Result interpretation, proof reading. HUR: Literature search, critical appraisal of finding with literature. AF: Data collection, result interpretation.

MU: Critical revision for important intellectual content. SUS: Study design and data collection.

REFERENCES

1. Awan RA. Drug, medicine, poisoning and its management. in: Awan RA, editor. Principle and practice of Forensic Medicine. Lahore, Pakistan: Zubair book depot, 2018; p.164.
2. Introduction and law relating to poisons. In: Subrahmanyam B, Author. Parikh's textbook of medical jurisprudence forensic medicine. 7th ed. India: CBS Publishers & Distributors Pvt Ltd, 2016; p.507–9.
3. Meera T. Medicolegal cases: What every doctor should know. J Med Soc 2016;30(3):133–4.
4. Rajbanshi LK, Arjyal B, Mandal R. Clinical Profile and Outcome of Patients with Acute Poisoning Admitted in Intensive Care Unit of Tertiary Care Center in Eastern Nepal. Indian J Crit Care Med 2018;22(10):691–6.
5. Patil D. Study of pattern of poisoning in a tertiary care hospital. Medico-Legal Update 2014;14(2):1–3.
6. Khan NU, Pérez-Núñez R, Shamim N, Khan U, Naseer N, Feroze A, et al. Intentional and unintentional poisoning in Pakistan: a pilot study using the Emergency Departments surveillance project. BMC Emerg Med 2015;15(Suppl 2):S2.
7. Qureshi MA, Nadeem S, Ahmed T, Tariq F, Rehman H, Qasim AP. Aluminium Phosphide Poisoning: Clinical Profile and Outcome of Patients Admitted in a Tertiary Care Hospital. Ann Punjab Med Coll 2018;12(3):191–4.
8. Durrani A, Shahid O, Sabir A, Faisal M. Types of Poisoning Agents Used in Patients Admitted to Medical Department of Holy Family Hospital, Rawalpindi (Pakistan) from 2011 to 2015. Asia Pac J Med Toxicol 2017;6(2):50–4.
9. Mbarouk GS, Sawe HR, Mfinanga JA, Stein J, Levin S, Mwafongo V, et al. Patients with acute poisoning presenting to an urban emergency department of a tertiary hospital in Tanzania. BMC Res Notes 2017;10(1):482.
10. WHO. Disease burden and mortality estimates [Internet]. World Health Organization; [cited 2020 Feb 22]. Available from: http://www.who.int/healthinfo/global_burden_disease/estimates/en/
11. Nicolai N, Elena FO, Aniela R, Mihaela CI, Cristina J, Violeta S. Epidemiological study on accidental poisonings in children from northeast Romania. Medicine 2018:97(29):e11469.
12. Lingeswaran A. Patterns of accidental poisoning in children in Puducherry, India. Paripex-Indian J Res 2016;5(2):301–2.
13. ul Hassan O, Qadri H, Mir U, Ahmed B. Unintentional childhood poisoning, epidemiology and strategies for the prevention and policy change in Pakistan. J Ayub Med Coll Abbottabad 2013;25(3-4):90–3.
14. Ulmeanu C, NitescuViorela. Intoxicatiile acute la copilsi adolescent. Ed TridonaBucuresti 2015;7–12.
15. Sahin S, Carman KB, Dinleyei EC. Acute poisoning in children: data of pediatric emergency unit. Iran J Pediatr 2011;21(4):479–84.
16. Jiang A, Smith J, Rajabali F, Zheng A, Purssell R, Pike I. Patterns in poisoning hospitalizations and deaths in britishcolumbia, 2008 TO 2013. Br Columbia Med J 2019;60(10):495–502.
17. Saglam ZA, Demir B, Ataoglu EH, Yenigun M, Temiz LU, Saler T. Causes of acute poisoning in adults: a retrospective study, in a hospital in Istanbul, Turkey. J Public Health 2011;20(1):59–63.
18. Gummin DD, Mowry JB, Spyker DA, Brooks DE, Osterthaler KM, Banner W. 2017 Annual Report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 35th Annual Report. Clin Toxicol 2018;56(12):1213–415.
19. Muhammad R, Afridi MAR, Ali Z, Asghar M, Sebtain A, Amer K, et al. Etiological and clinical profile of patients presenting with acute poisoning to a teaching hospital. J Postgrad Med Inst 2018;32(1):54–9.
20. Prosser JM, Perrone J, Pines JM. The epidemiology of intentional non-fatal self-harm poisoning in the United States: 2001–2004. J Med Toxicol 2007;3(1):20–4.
21. Callanan VJ, Davis MS. Gender differences in suicide methods. Soc Psychiatry Psychiatr Epidemiol 2012;47(6):857–69.
22. Singh B, Unnikrishnan B. A profile of acute poisoning at Mangalore (South India). J Clin Forensic Med 2006;13(3):112–6.
23. Malik AK, Sharma D, Dhattarwal SK, Panchal K, Singla k. a study of thermal deaths in Rohtak, Haryana. Medico-Legal Update 2019;19(1):52–5.
24. Hawton K, Goldacre M. Hospital admissions for adverse effects of medicinal agents (mainly self-poisoning) among adolescents in the Oxford region. Br J Psychiatry 1982;141(2):166–70.

Submitted: May 19, 2020	*Revised: November 1, 2020*	*Accepted: November 11, 2020*

Address for Correspondence:

Dr. Salma Shazia, Department of forensic Medicine, Ayub Medical College, Abbottabad-Pakistan
Email: salmahrn@yahoo.com