

Research Article

Spectrum of acute poisoning: A retrospective observational study in a tertiary care hospital in North India

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ABSTRACT

Background: Acute poisoning is an important medical emergency and its pattern and outcome varies from place to place.

Aims and Objective: This study was conducted to evaluate the spectrum of acute poisoning in a tertiary care hospital.

Materials and Methods: This is a retrospective study of acute poisoning cases brought to emergency department of a tertiary care hospital from 1st January to 30th June 2015. **Result:** Total 256 cases of acute poisoning were recorded over a period of 6 months. Acute poisoning was common in men, and age group of 18–25 years was the most affected. The most common offending agent was agricultural pesticides (28.5%) and in this group mortality was maximum with aluminum phosphide (43.4%). The case fatality with unknown agents was reported to be (12.8%). **Conclusion:** From the results of this study, we conclude that acute poisoning is a common problem and male population is the most affected. Organophosphorous is a common poisoning and aluminum phosphide accounted for majority of fatal outcome. The outcome of this study underscores the importance of proper storage, distribution, sale and disposal of the pesticides, and advanced laboratory support.

KEY WORDS: Acute Poisoning; Organophosphorous; Aluminum Phosphide; Self-Harm; Pattern and Outcome; Pesticide

INTRODUCTION

Acute poisoning is an important medical emergency. The nature of poison used varies in different parts of the world and may vary even in different parts of the same country depending on the socioeconomic factors and cultural diversity. Poison refers to any agent that can kill, injure, or impair normal physiological function in humans by its chemical activity.^[1,2]

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The World Health Organization estimates based on 2012 data indicate that 193,460 people die globally from unintentional poisoning each year.^[3] However, poisoning is the most common form of fatal self-harm in rural Asia, accounting for over 60% of all deaths and is of far greater importance than hanging and other physical form of self-harm.^[4]

In general, accidental poisoning is more common in children, whereas suicidal poisoning is more common in young adults.^[5] With the progress in industrial and agricultural field and advances in medical science, a number of pesticides and other drugs have become available, which on exposure may produce serious toxicity. This situation is worse especially in rural areas where there is easy availability of these toxic agents. Therefore, this study was undertaken in our predominant agricultural society to identify the nature of poison and outcome. Studies of this nature will be a useful tool in the planning and management of critically ill acute poisoning cases.

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MATERIALS AND METHODS

This study was conducted after due permission from institutional ethical committee of the Government Medical College, Jammu, Jammu and Kashmir, India. All cases admitted to the emergency department of the hospital over a period of 6 months were evaluated retrospectively. Data were obtained from the hospital medical records and included the demographic characteristics, agents, routes, modes, and outcomes. All patients with acute poisoning were included in the study. The cases of snake bite, food poisoning, and allergic reactions to drugs were not included in the study. Data were documented, analyzed as percentage, and final conclusion was drawn.

RESULT

A total of 78,873 patients got admitted to the emergency department of the hospital over a period of 6 months. A total of 256 patients were of acute poisoning. This was 0.3% of all emergency admissions. Incidence of poisoning was more in men (53.9%) as compared with women (46%) with a ratio of 1.16:1. Most cases of acute poisoning presented in the age group of 18–25 years (56.2%) followed by 26–50 years (40.2%), and the majority of patients (61.3%) were of rural background.

Manner of poisoning was suicidal in 251 (98%) cases and accidental in 3 cases whereas only 2 cases of homicide were reported. With regard to the route of exposure, ingestion was the most common mode of intake whereas inhalational poisoning was reported by only one patient (Table 1). The most important agents of acute poisoning were agricultural pesticides (28.3%) followed by household products (25.3%), drug overdose (18.3%), combination agents (5.8%), unknown agents (3.9%), psychotropic drugs (3.7%), and industrial corrosives (2.7%) (Table 2).

Of all the poisoning cases admitted during the study period, 87.1% improved and were discharged. Overall mortality in the study was 9.7%, of which agricultural pesticides contributed to 72% of deaths followed by unknown agents (20%). Case fatality was highest with aluminum phosphide (43.4%) followed by organophosphates (16%) and unknown agents (12.8%) (Table 3).

DISCUSSION

Our study shows important pattern of poisoning in emergency department of a tertiary care hospital. Men dominated the study with male:female ratio of 1.6:1. Majority of the poisoning cases presented between 18 and 25 years of age group (56.2%) in concurrence with other studies.^[5,6] A high proportion of poisoning among men in these productive years may be attributed to high degree of stress in academic, financial, and emotional fronts, and also inability to achieve targets may contribute to suicidal actions as observed by others.^[6] Agricultural pesticides (28.5%) followed by household products (25.3%) were the most common types of

Table 1: Demographic profile of patients

Characteristic	n (%)
Sex	
Male	138 (53.9)
Female	118 (46)
Age	
18–25	144 (56.2)
26–50	103 (40.2)
>50	9 (3.5)
Area	
Urban	99 (38.6)
Rural	157 (61.3)
Mode of poisoning	
Intentional	251 (98)
Accidental	3 (1.1)
Homicidal	2 (0.7)
Means of exposure	
Ingestion	255 (99.6)
Inhalation	1 (0.3)
Outcome	
Recovery	223 (9.7)
LAMA	8 (3.1)
Death	25 (9.7)

LAMA,

poisoning in concurrence with other studies.^[7] However, a study conducted at the All India Institute of Medical Sciences, New Delhi showed that drugs (18%) and insecticides (12.8%) are the most common agents.^[8] This difference in the type of poisoning seen within the country may be due to the difference in the pattern in the use and availability of poisons. Ours is an agriculture-based society and these compounds are easily available and thus, it is the most common class implicated in cases of poisoning.

Majority of the patients consumed poison with suicidal intent (98%) as compared with accidental (1.1%) and homicidal (0.7%) cases; this was in concurrence with other studies.^[9,10] In contrast, another study conducted at New Delhi highlighted that nearly half (47%) of the poisoning cases were accidental.^[11] This disparity could be due to the difference in inclusion criteria as unlike them we did not include pediatric patients.

Table 2: Nature of poison

Poison	n (%)
Agricultural pesticides	73 (28.5)
Household products	65 (25.3)
Drug overdose	47 (18.3)
Ethyl alcohol	29 (11.32)
Unknown agents	10 (3.9)
Combination agents	15 (5.8)
Psychotropic drugs	10 (3.7)
Industrial corrosives	7 (2.7)

Table 3: Agents incriminated in acute poisoning

Groups	Agents	No. of cases	No. of deaths	Case fatality (5%)
Agricultural pesticides	Organophosphates	50	8	16
	Aluminum Phosphide	23	10	43.4
Household products	Rodenticide	28	1	3.5
	Phenyl	21		
	Harpic	11		
	Insecticides	5		
Drug overdose	Sedatives	27		
	NSAIDs	10		
	Antipsychotics	5		
	Antiepileptics	3		
	Thyroxine	2		
			5	
Unknown agents		39		12.8
Ethyl alcohol		29		
Combination agents	Alcohol + rodenticide	5		
	Alcohol + sedatives	4		
	Alcohol + aluminum phosphide	2		
	Alcohol + organophosphates	1		
	Alcohol + insecticides	1		
	Alcohol + Dettol	1		
	Alcohol + hair dye	1		
Psychotropic drugs	Bhang	3		
	Datura	3		
	Marijuana	2		
	Opium	2		
Industrial corrosives	Kerosene oil	2		
	Acetic acid	2		
	Carbon tetrachloride	1	1	100
	Benzoic acid	1		
	Alloy fume	1		

NSAIDs,

In this study, incidence was more in rural population and oral ingestion was found to be the most common route of poisoning, similar findings were observed by other authors.^[5,12,13]

The retrospective record-based nature and relatively less period studied are the limitations of our study. Overall, this study has managed to contribute substantial information regarding the pattern of poisoning in a tertiary care hospital. Case fatality with unknown agents was 12.8%; thus, stressing on the need of some advance laboratory support with facilities such as liquid gas chromatography in the department of clinical pharmacology as the challenging aspect of poisoning is to find out the nature of poisoning, to take appropriate measures and bring down the mortality rates.

CONCLUSION

From the results of this study, we conclude that poisoning is common and constitutes (0.3%) of all emergency admissions. Men were the most affected and poisoning was suicidal in the

majority (98%) of the cases. Organophosphorus was most commonly used and aluminum phosphide was the main culprit for mortality. The outcome of the study calls for effective measures on the distribution, storage, sale, and safe disposal of unused agricultural pesticides and advanced laboratory testing. Public education is also of utmost importance in this regard.

REFERENCES

1. Ramesha KN, Rao KBH, Kumar GS. Pattern and outcome of acute poisoning cases in a tertiary care hospital in Karnataka, India. Indian J Crit Care Med. 2009;13(3):152-5.
2. Gallo MA. History and scope of toxicology In:(Ed.) *Toxicology, the Basic Sciences of Poisons*, 5th edn., New York: McGrawHill, 1996.
3. World Health Organization. *International Programme on Chemical Safety*. Poisoning Prevention and Management Report 2012. Geneva, Switzerland: WHO, 2012.

4. Somasundaram DJ, Rajadurai S. War and suicide in northern Sri Lanka. *Acta Psychiatr Scand.* 1995;91(1):1–4.
5. Khajuria V, Shah S, Tandon VR, Gillani Z, Gupta R, Sharma A, et al. Organophosphorus poisoning in a tertiary hospital of North India—a preliminary report. *Bull Pharmaceutical Med Sci.* 2013;1(1):41–3.
6. Dash SK, Aluri SR, Mohanty MK, Patnaik KK, Mohanty S. Sociodemographic profile of poisoning cases. *JIAFM.* 2005;27(3):133–8.
7. Prajapati T, Prajapati K, Tandon RN, Merchant S. A study of acute poisoning cases excluding animal bites at civil hospital, Ahmedabad. *J Indian Acad Forensic Med.* 2013;3(2):120–2.
8. Das RK. Epidemiology of insecticide poisoning at AIIMS emergency services and role of its detection by gas liquid chromatography in diagnosis. *Medico Update.* 2007;7(2):49–60.
9. Kar SM, Timsinha S, Agrawal P. An epidemiological study of organophosphorus poisoning at Manipal teaching hospital, Nepal. *J Indian Acad Forensic Med.* 2010;32(2):108–9.
10. Chataut J, Adhikari RK, Sinha NP, Marahatta SB. Pattern of organophosphorus poisoning: a retrospective community based study. *Kathmandu Univ Med J.* 2011;9(2):31–4.
11. Srivastava A, Peshin SS, Kaleekal T, Gupta SK. An epidemiological study of poisoning cases reported to the National Poisons Information Centre, All India Institute of Medical Sciences, New Delhi. *Hum Exp Toxicol.* 2005;24(6):279–85.
12. Thunga G, Sam KG, Khera K, Pandey S, Sagar SV. Evaluation of incidence, clinical characteristics and management in organophosphorus poisoning patients in a tertiary care hospital. *J Toxicol Environ Health Sci.* 2010;2(5):73–6.
13. Malik GM, Mubarik M, Romshoo GJ. Organophosphorus poisoning in the Kashmir valley, 1994 to 1997. *N Engl J Med.* 1998;338(15):1078–9.

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