

Pattern and outcome of acute poisoning cases in selected hospitals in Uttar Pradesh

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Abstract

Background and objective: Poisoning is a global public health problem causing significant morbidity and mortality. It is important to know the pattern and outcome of acute poisoning cases for proper planning, prevention and management of these cases. The aim of the study was carried out to assess the patterns, associated factors, clinical outcomes and type of acute poisoning cases in various hospitals in Uttar Pradesh, India. **Materials and methods:** This hospital based prospective study was conducted in various hospitals in Uttar Pradesh, India. A total of 309 patients were enrolled in the study after obtaining informed consent. **Results:** Poisoning was more common among males (57.6%). Most of the people were between 15 to 30 years (79.9%) followed by 31 to 45 years (15.5%). About 57% were married and nearly 2.6% were illiterate. Major Cardinal clinical features of poisoning were nausea and vomiting. Majority of the acute poisoning was Organophosphorous compound type (41.1%), followed by Aluminium phosphide in 22.3 % and about 14.0 % were dye poisoning. In patients with poisoning, main route of ingestion was oral. **Conclusion:** Poisoning is predominant in young males. The overall mortality is considerably high, mainly contributed by self-poisoning with Organophosphorous and Aluminium phosphide.

Keywords: Aluminium phosphide, organophosphate, poisoning

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Introduction

Acute poisoning is crucial medical emergency. Poison nature generally varies in all over the world and may also vary in all over the country as well because of socioeconomic factors and cultural differences. If causes and type of poisoning are correctly defined, then management vitally ill patients will significantly recover[1]. Out of total world suicides, pesticide self-poisoning responsible for approximately 1/3rd of the total suicides. According to Indian government data probably undervalue the incidence of suicides. The percentage of all suicides from pesticides show a discrepancies from 4% in the European county to over 50% in the Western Pacific county, however this percentage is not be in agreement with the amount of pesticides retailed in each region; it is the prototype of uses of pesticide and the lethal of the stuff, not the amount used, that demands the possibility that they will be used in acts of lethal self-harm[2]. Growth in the agricultural field and industries, advances in medical fields a huge number of insecticides have become accessible, with contact or exposure may turn out severe toxicity. Very limited information related to acute poisoning in adults is available in our country, including hospitalized patients[3-7].

Generally, accidental poisoning is more frequent in children, while suicidal poisoning is more frequent in young adults[3]. A study from Vellore has revealed an increasing trend of self-poisoning, especially among young adults[7]. In a particular area, information regarding types, characteristics and level of poisoning is important not only for management and diagnosis reason other than to introduce preventive measures for future[8]. However, in India, the epidemiological data and complete information regarding the importance of poisoning and its particular clinical outcomes are unidentified. Very few studies carried out in other parts of the country have not determined the pattern and clinical outcomes of the accounted poisoning. It is imperative to know the characteristic and severity of poisoning for taking appropriate preventive measures. Studies of this nature will be a helpful tool in planning and management of decisively ill acute poisoning cases. In this context the present study was carried out to assess the patterns, associated factors, clinical outcomes and type of acute poisoning cases in various hospitals in Uttar Pradesh, India.

Materials and Methods

This prospective hospital record-based study was conducted in various hospitals in Uttar Pradesh, India. The study included 309 various acute poisoning cases aged above 15 years. The study has been undertaken for 18 months from January 2017 to July 2018. All the poisoning cases admitted in emergency ward, ICU and medical wards of various hospitals in Uttar Pradesh, India were enrolled in the study after obtaining informed consent. The study was approved by the Institutional Ethics Committee. Data regarding socio-demographic profile, clinical profile, lab parameters, electrocardiography (ECG), arterial blood gases (ABG), radiological investigations, name of poisonous substance, chemical type, severity and outcome were collected in the predesigned and pretested proforma. Modified Prasad's classification was applied to measure the individual's socioeconomic status. [9] Data was collected for general physical examination and systemic examination of the patient. Animal bites/stings cases were excluded from study.

Statistical analysis

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The data collected was entered in the computer database. The statistical analysis was done using SPSS (Statistical Package for Social Sciences) Version 16.0 statistical Analysis Software. Pattern and outcomes of poisoning cases were described by sociodemographic and clinical characteristics in frequency and percentage.

Results

Of the 309 sample size, 57.6% (178) were males and 42.3% (131) were female. Mean age was 26.0 years with standard deviation of 9.89 years. Majority of study subjects were belongs to Hindu community (93.5%). About 57% were married. Majority of study subjects belongs to upper lower class (32.7%) followed by lower middle class 23.6%. Only 2.6% were illiterate. About 46.3% study subjects were unemployed.

Table 1: Type of poisoning in study population (n=309)

Poisoning	N (%)
Organophosphorous	127(41.1)
Aluminium phosphide	69(22.3)
Dye	44(14.2)
Herbicides	19(6.14)
Rodenticide	18(5.82)
Unknown	10(3.23)
Kerosene	7(2.26)
Drug	6(1.94)
Corrosive Acid	4(1.29)
Paint	2(0.64)
Mosquito Repellent	1(0.32)
Mercury Compound	1(0.32)
Dhatura	1(0.32)

Table 1 shows type of poisoning in which majority of the acute poisoning was Organophosphorous compound (41.1%) followed by Aluminium phosphide (22.3%) , 14.2% were Dye poisoning, 6.14% were herbicides, 5.82% were rodenticide and 10.36% were other poisons. Other poisoning include kerosene poisoning, drug over dose, corrosive acid, paint, mosquito repellent, mercury compound, dhatura and unknown.

Table 2: Clinical features of the poisoning cases (n = 309)

Complaints	N (%)
Nausea, Vomiting	242(78.31)
Abdominal pain	53(17.15)
Altered sensorium	45(14.56)
Breathlessness	21(6.79)
Cervicofacial swelling	13(4.20)
Gasping	7(2.26)
Dizziness	2(0.64)
Excessive sleepiness	2(0.64)
Palpitation	1(0.32)

Table 2 shows that the clinical features of the poisoning cases. Cardinal clinical features of poisoning were nausea and vomiting (78.31%), abdominal pain (17.15%) altered sensorium (14.56%), breathlessness (6.79%), Cervicofacial swelling (4.2%). Very few number of cases were showing dizziness (0.64%), excessive sleepiness (0.64%), gasping (2.26%) and palpitation (0.32%)

Table 3: Outcomes of various poisonings

Poisoning	Total number of cases	Number of Deaths	Case Fatality (%)
Aluminium phosphide	69	62	89.9
Dye	44	13	29.5
Herbicides	19	1	5.3
Organophosphorous	127	14	11.0
Rodenticide	18	3	16.7
Unknown	10	3	30.0
Others	22	2	9.1

Table 3 shows the outcomes of various poisonings. Overall survival in present study was seen 211 (68.3%) cases. Mortality was in 98 (31.7%) cases. Majority of death was seen in Aluminium phosphide (n = 62). Case fatality was 89.9%. Followed by Organophosphorous (n = 14). On the other hand, case fatality was seen second highest in dye poisoning (29.5%). Three deaths due to rodenticide from 18 cases, one death due to herbicidal out of 19 cases.

Table 4: Demographic profile of poisonings cases of Organophosphorous, Aluminium phosphide and Dye

Socio demographic features	Number of cases		
	Organophosphorous (n =127)	Aluminium phosphide (n =69)	Dye (n =44)
Age (years)			
15-30	98	59	35
31-45	17	8	9
46-60	7	1	0
>60	4	0	0
Sex			
Male	77	34	21
Female	50	35	23

Marital Status			
Married	69	42	27
Unmarried	58	27	17
Religion			
Hindu	115	67	41
Muslim	2	2	3
Socio economic status			
Upper class	14	1	4
Upper middle class	15	10	12
Lower middle class	25	23	12
Upper lower	42	26	12
Lower class	31	9	4
Education			
Professor	15	2	0
Graduate	5	1	1
Intermediate	23	22	22
High School	61	30	18
Middle School	18	7	11
Primary School	4	3	2
Illiterate	1	4	2
Occupation			
Farmer	41	12	6
House wife	6	5	10
Professional	2	2	0
Skilled	5	3	4
Semi skilled	9	5	0
Semi Professional	4	7	2
Unemployed	60	35	22

Table 4 shows the demographic profile of poisonings cases of Organophosphorous, Aluminium phosphide and Dye. Majority of cases were belongs to 15 years to 30 years. Males were predominant in Organophosphorous poisoning whereas females were predominant in dye poisoning. Approximately equal proportion of male and female were found in Aluminium phosphide poisoning. In Organophosphorous 54.3%, and in Aluminium phosphide 60.9% and 61.4% poisoning cases were married.

Table 5: Clinical and biochemical features of poisonings cases of Organophosphorous, Aluminium phosphide and Dye.

Clinical and biochemical features	Number of cases		
	Organophosphorous (n =127)	Aluminium phosphide (n =69)	Dye (n =44)
Route of ingestion			
Oral	126	69	100
Inhalation	1	0	0
Pulse rate			
Normal	8	48	31
Tachycardia	114	21	13
Bradycardia	5	0	0
Blood Pressure			
Normal	124	47	44
Hypotension	3	22	0
Chest			
Normal	73	69	31
Crepitations	54	0	13
Liver Function			
Normal	89	11	30
Deranged	38	58	14
Renal Function			
Normal	68	9	30
Deranged	59	60	14
ECG			
Normal	8	7	-
Sinus Tachycardia	114	32	-
Sinus Bradycardia	5	3	-
Other	-	27	-
Arterial Blood Gas			
Normal	-	7	-
Metabolic Acidosis	-	62	-
Outcome			
Death	14	62	13
Discharge	113	7	31

Table 5 shows the clinical and biochemical features of poisonings cases of Organophosphorous, Aluminium phosphide and Dye. In patients with Organophosphorous poisoning, the most common route of ingestion was oral (99.2%). About ninety percent cases had tachycardia. Mortality was seen in 14 cases. Cause of mortality was late presentation, sepsis with multi organ dysfunction, one patient had ventilator associated pneumonia. Three patients presented with gasping state. During follow up one young female patient developed delayed polyneuropathy. Hundred percent were ingestion orally in patients with Aluminium phosphide. During follow up 89.9% developed hypotension. Liver function was deranged in 84.1% and renal function was deranged in 87% of cases. Sixty two patients of Aluminium phosphide developed metabolic acidosis and refractory hypotension during hospital stay. In patients with dye poisoning, main route of ingestion was oral. Eight patients required haemodialysis for deranged renal function.

Discussion

In the present study most of the people were between 15 to 30 years (79.9%) followed by 31 to 45 years (15.5%). Similar pattern has been reported by studies conducted in northern and central India [10-14]. Studies conducted in other countries also showed that poisoning was common in age group of 15 to 30. A clinical audit conducted by Owais Ket al. in Pakistan showed that most common age group of poisoning was 15 to 30 [15]. Similar findings were found by Hovda KE et al. in Oslo, Norway [16]. This can be explained by the fact that majority of the young people have more professional, social and economic stress and they have more of family conflicts compared to adults. In present study 57.6% were males and 42.3% were females. Male outnumbered the females. Incidence of poisoning is more in male. About 57% were married. Although a study reported that 66.7% of the suicide victims were married whereas 23.6% were unmarried [17]. In a study conducted by Patil A et al [18]. in Mumbai 51.4% were males, 59.6% were male in a study conducted by Zaheer M S et al [19]. in Aligarh, north India. Nalabothu M et al [20]. in Manipal, Aggarwal et al [10]. in Delhi, Dhatarwal SK et al [12]. in Haryana, Gupta S et al [21]. in Gujarat, K N Ramesha et al [22]. in Karnataka showed similar findings. Unlike our study few studies had female predominance [23,24]. Of the study population 93.5% were Hindus and 6.5% were Muslims. Most of the studies conducted in India had majority of the population as Hindus. In a study conducted by Patel NS et al [25] in Meerut, Uttar Pradesh 91.26% of study population was Hindus. Similar findings were found in other studies conducted in other part of the country [26]. In present study majority of the acute poisoning was Organophosphorous compound (41.1%), followed by Aluminium phosphide (Aluminium phosphide) in 22.3 %, 14.2 % were dye poisoning. Similar finding reported by a study conducted in Pondicherry revealed a rapidly increasing trend in the incidence of Organophosphorous compound poisoning over a 3-year period [27]. Other studies also showed that Organophosphorous compound are the most commonly used poisoning substances [4,7]. In contrast, some other studies showed that majority of poisoning admissions were due to pharmaceutical agents [3,28]. A study conducted at the All India Institute for Medical Sciences, New Delhi, showed that drugs (18%) and insecticides (12.80%) are the most common agents out of a total of 726 poisoning cases. Out of this insecticide group, carbamate (47) formed the largest group followed by Organophosphorous compound (43) and organochlorine compounds [3]. This variance in the type of poisoning observed within the country possibly will be because of variance in the pattern of use and availability of pesticides. Ali I et al reported that the Organophosphate and aluminium phosphide are common agents used for poisoning because of low cost and easy availability [29]. In present study, cardinal clinical features of poisoning were nausea and vomiting (78.31%), abdominal pain (17.15%), altered sensorium (14.56%), breathlessness (6.79%), Cervicofacial swelling (4.2%), dizziness (0.64%), excessive sleepiness (0.64%), gasping (2.26%) and palpitation (0.32%). In addition, Woyessa AH and Palanichamy T reported that abdominal pain was 28.91% of the study participants, unconsciousness (19.43%), change in skin color (16.59%), and

shortness of breath (3.79%) were also amongst clinical findings in the study [30]. In present study, the overall mortality was found to be 31.7%. In contrast, a study which reported an overall mortality rate of 17.3% [1]. Other studies also showed it as 3% - 4% [7,27,28]. Mortality in the present study is probably higher because of a higher number of Organophosphorous poisoning and Aluminium phosphide poisoning cases. Other poisonings include in present study, kerosene poisoning, drug overdose, corrosive acid, paint, mosquito repellent, mercury compound and datura. Aluminium phosphide is being extensively reported as one of the commonest means of poisoning in North India [31]. Mortality rate in Aluminium phosphide poisoning varies from 35% to 100% and principally depends upon the amount consumed, the relative freshness or otherwise of the compound, promptness or delay in treatment, duration of shock, and efficacy of treatment. All 62 patients developed metabolic acidosis and refractory hypotension during hospital stay. With no known antidote, ingestion of unexposed (fresh) tablets has greater risk of fatal outcome. Severe poisoning causes death in about 3 hrs, ranging between 1-48 hrs. Clinical appearance relies on the time elapsed from the time of ingestion. Usually, the degree, features, and the clinical outcomes of poisoning are mostly assessed by each participant sociodemographic variables, common occupation in a community, easily accessible and available type of poisoning agent [1,32-34].

Conclusion

Poisoning is predominant in young males. The overall mortality is considerably high, mainly contributed by self-poisoning with Organophosphorous and Aluminium phosphide. This study has obviously presented that there has been variation in incidences of poisoning cases, which were also ended up with miscellaneous clinical outcomes. The outcomes of patients were found to vary with patients' demographic and clinical characteristics. Therefore, initiating community awareness and designing sound prevention guidelines must be considered to reduce morbidity and mortality related to poisoning.

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