

Study of Drug Utilization on Acute Poisoning Cases Treated at Tertiary Care Hospital

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Abstract

Acute poisoning is common everywhere in medical emergency. Acute poisoning may be due to deliberate exposure to drugs, chemicals and natural toxins or accidental which is emergency for common medical health. The main aim of this study was to investigate the pattern of drug utilization, poisoning agents, and outcome in patients with treated acute poisoning. **Material and Methods:** This prospective cross sectional study was carried out in the emergency department of a tertiary care centre over a one year period. **Result:** During the period of 1 year total 310 Acute poisoning cases were recorded by us. Out of 310 acute poisoning cases 170(54.8%) were male where as females were 140(45.2%). The majority of cases were from age group of 20 -50 years in males whereas mean age of female patients was 37.3 years and majority of the cases were from 25-50 age group. The most common route of exposure to poisons (69.6%) was ingestion and followed by dermal exposure (in cases of venomous animal exposures) (25.8%) and inhalation (4.6%). The most common symptomatic treatments given to the patients were antimicrobials (88.7% of cases), antiemetics (82.6% of cases), H2 blockers (72.9% of cases) and Atropine (51% of cases), pralidoxime (41.6% of cases) Proton pump inhibitors and Vasopressor agents etc respectively. The most commonly prescribed specific antidotes were Anti-snake venom (ASV) (12.9% of cases). **Conclusion:** In the present study, the main causes of poisoning were identified as household products in urban areas of India. Awareness about the dangers of such poisons should be the added responsibility of health and hospital authorities. Poison control center establishment in the region will also help in preventing and controlling such poisoning events.

Keywords: Drugs, Poison, organophosphorus compound, Household Products, India

Introduction

In the field of the human health Acute poisoning is also one of the common medical emergencies. Acute poisoning may be due to deliberate exposure to drugs, chemicals and natural toxins or accidental which is an emergency for common medical health services. Acute poisoning is a major health problem worldwide with significant mortality and morbidity affecting all age groups of people. In the developing world, Poisoning is a major public health problem resulting in hospitalization and health threats leading to prominent financial load on patients and an immense pressure on hospital services. According to the previous reports about 700 people die every day from poisonings and several thousands are more affected by poisoning around the world.^[1,2,3] According to national annual report of India in 2012, 110,688 people died due to poisoning. In the year 2012, according to data from National Crime Bureau of India 7.8% of all causes of un-natural deaths are for accidental poisoning. In the same year 2012, 29.5% of suicidal deaths were observed for poison ingestion for committing suicide.^[4] The measure of the problem can be explained by regionwise or countrywise epidemiological studies.^[5]

The pattern of poisoning differ from region to region and country to country depending on factors like geography, availability of poison, accessibility, socio-economic conditions, cultural and religious influences. In developed countries such as Norway,

paracetamol, ethanol and benzodiazepines are the most common causes of poisoning.^[6] In India the majority of the population is employed in agriculture, due to more uses of pesticides and agrochemical products poisoning is more common.^[7] In India, an acute poisoning case is one of the most common causes of emergency hospital admissions. It has been reported that approximately constitutes 10% acute poisoning cases of admissions in medical emergency departments.^[8] The management of acute poisonings cases depends upon availability of healthcare facilities, institutional protocols and life-saving drugs. Every academic medical institutional sector has to manage for regularly evaluate drug utilization in different departments and review institutional therapeutic protocols to rationalize drug use and enhance patients' outcome.^[9] There is also necessary to evaluate annual epidemiologic data on acute poisonings treated cases at each medical sector for better handle and manage antidote stock and drugs.^[10] Therefore this study was done for investigate the pattern of drug utilization, poisoning agent and treated of acute poisoning cases with outcomes.

Materials and Methods

This study was conducted in the Dept. of Pharmacology at Institute of Postgraduate Medical Education and Research, Kolkata. The study was carried out for the period of 1 year in 2015 to 2016. Patients included in this study were those who admit poisoned patients initially, admitted to emergency department and also

admits referrals (severe poisoned patients) from secondary care hospitals and private hospitals in this region. On the basis of history, clinical findings and in some cases through routine laboratory investigations was made for diagnosis. Those patients with 10 years of age and uncertain diagnosis were excluded from the study. From institutional ethics committee for human research and related committee approval was taken before initiating study. The confidentiality of patient's personal information was maintained.

In this study data such as age, duration of hospital stay, clinical findings, final diagnosis, treatments delivered and final outcomes were taken from the case papers during their admission in the hospital. Also drugs prescribed for patients by brand names and for fixed dose combinations, the information about generic name of the drugs and contents of formulations were obtained from the 2013 edition of Indian Drug Review and the 2013 edition of Current Index of Medical Specialties.

Observations and Results

During the period of 1 year total 310 Acute Poisoning Cases were recorded by us at a tertiary care centre. Out of 310 acute poisoning cases 170(54.8%) were male where as females were 140(45.2%). ICH Mean age of the patients was 28.3 years which belong to age group 20 -30 years. The majority of cases were from age group of 20 -50 years in males whereas mean age of female patients was 23.3 years and majority of the cases were from age group which was equivalent to male as shown in table no 1. Most of the patients reside in urban areas and maximum numbers of patients were Hindus followed by Muslims. A highest frequency of poisoning was seen in unmarried cases.

Table 1: Number of poisonings by age group and sex

Age group (in years)	Sex		Total	Percentage (%)
	Male	Female		
10-20	12	5	17	5.5
20-30	36	28	64	20.6
30-40	25	22	47	15.2
40-50	58	51	109	35.2
50-60	32	28	60	19.4
60-70	7	6	13	4.2
Total	170	140	310	100

The most common route of exposure to poisons (69.6%) was ingestion and followed by dermal exposure (in cases of venomous animal exposures) (25.8%) and inhalation (4.6%). Intentional (suicidal) was the most common mode of poisoning, which was observed in 65.1% of cases while accidental poisoning accounted for 34.9% of cases. Table no 2 shows different causative poisoning agents which were observed during this study. The most common causes of poisoning cases were pesticides (40.6%), followed by Venomous animal exposures 25.8% and Household agents (18.7%) respectively. Venomous animal exposures included snake bites, honey bee stings, and unknown bites and stings. In 7.4% of cases, the poisoning agents could not be identified. Vomiting, dizziness, difficulty in breathing, abdominal pain, local punctures and bite marks in venomous animal exposures etc were observed symptoms in the patients.

Table 2: Poisoning agents of acute poisoning cases

Poisoning agents	Number	Percentage (%)
Household agents	58	18.7
Hydrocarbons	50	16.1
Cosmetic	3	1.0
Corrosive agents ³	5	1.6
Pesticides	126	40.6
Organophosphates	68	21.9
Variable insecticides	30	9.7
Rodenticides	24	7.7
Herbicides	2	0.6
Aluminum phosphide	1	0.3
Organophosphate + pyrethroid	1	0.3
Venomous animal exposures	80	25.8
Drugs	15	4.8
Insecticide + Kerosene	3	1.0
Food poisoning	2	0.6
Unknown compounds	23	7.4
Total	310	100

Table no 2 showing various Poisoning agents of acute poisoning cases. Poisoning agents number of cases and its percentage show in above table.

Table 3: Medicines prescribed for acute poisoning cases

Medicines	Number	Percentage (%)
As Specific Antidote		
Atropine	158	51.0
Pralidoxime	129	41.6
Anti-snake venom	40	12.9
Neostigmine**	9	2.9
Physostigmine***	1	0.3
As Symptomatic Treatment		
Antiemetic	256	82.6
H2 blockers*	226	72.9
Antimicrobials	275	88.7
Proton pump inhibitors*	105	33.9
Vasopressor agents	74	23.9
Tetanus toxoid	68	21.9
Analgesics	42	13.5
Anticonvulsants	31	10.0
Glucocorticoids	24	7.7
Benzodiazepine	21	6.8
Antihistamines	16	5.2
Calcium	12	3.9
Bronchodilators	8	2.6
Diuretics	5	1.6

Table no: 3 shows the most common symptomatic treatments given to the patients were antimicrobials (88.7% of cases) antiemetics (82.6% of cases), H2 blockers (72.9% of cases) and Atropine (51% of cases), pralidoxime (41.6% of cases) Proton pump inhibitors and Vasopressor agents etc respectively. The most commonly prescribed specific antidotes were Anti-snake venom (ASV) (12.9% of cases). As nutritional supplements, different

vitamin and enzyme preparations were also prescribed for patients, respectively.

Parenteral route was the most common route used for drug administration. Only 20 patients received drugs orally. Different drugs were prescribed including generic name and which were prescribed by brand name.

Mean duration of hospital stay was 6 ± 4 days with a median of 4 days. Maximum length of hospital stay was observed in a case of acid ingestion. Table no: 4 shows outcome of patients in which complete recovery was seen in 47.4% of cases and mortality rate was 23.2%. Out of 72 death cases, suicidal poisoning were 38 and accidental poisoning were 6 due which shows a statistically significant difference. Due to unknown compounds (14 cases), OP agents (5 cases), snakebites (2 cases), unclassified insecticides (3 cases), corrosive agents (1 case), aluminum phosphide (1 case), ethanol (2 cases) deaths were also recorded.

Table 4: Acute poisoning cases with its outcome

Outcome cases	Number	Percentage (%)
Complete recovery	147	47.4
Discharge against medical advice	66	21.3
Absconded	25	8.1
Death	72	23.2
Total	310	100

Discussion

In Emergency Departments of hospitals arrival of Poisoning cases are very common in India. The research shows that per month on an average 38 cases are reported and this is due to occupational exposures mainly ones involved in agriculture, easy availability of toxic agents and no awareness particularly in rural areas.^[11] In this study, a male predominance was observed which shows similar pattern by other studies in India as Mittal N et.al, Gupta P et.al and Ramesh V et.al.^[12,13,14] Due to increased occupational hazard, as well as love matter and exposure of men to stress being the earning member compared was to women may be the trend for this. In this study, most of the cases were between 20 to 50 years of age group which was similar to the other studies in India and may be due to love, domestic, educational and employment related stress.^[13,14,15] It is a known fact that adolescents and young adults are more prone to poisoning due to emotional problems, economical stress, work pressure, marriage, quarrel with family, and other life settlement factors.^[16] In this study, the most common poisoning agents were pesticides which were similar to Maharani et al studied similarly reported pesticides as the most common poisoning agent in Tamil Nadu, southern India.^[17] According to the Studies conducted in Nepal and Bangladesh also ascertained pesticides as the commonest toxic agent used for poisoning.^[18,19]

Common irrationally antimicrobials agents are used as medicines in low and middle income countries.^[20] An antibiotic resistance poses a serious threat to humans and subverts global economy. It is unaccountable that high usage of antibiotics exists in a poisoning ward. Various clinical trials did not prove any benefit of antibiotic therapy for acute poisonings especially in organophosphate poisoning and snakebites.^[21,22] In this study High mortality could be because of various reasons like lack of information regarding the poison agent and the dose/amount consumed in some cases,

long time interval between toxic exposure and hospital arrival, highly toxic pesticide ingestions, lethal snakebite envenomations and finally lack of specific antidotes. Many patients were referred when their conditions had become worse from hospitals with a delay. The majority of the patients recovered, indicates good emergency and intensive care management in our setting. Therefore morbidity and mortality will help decrease poisoning center in tertiary care hospitals.

Conclusion

In the present study, the main causes of poisoning were identified household products in urban areas of India. This finding emphasizes that education of the general people about the risk of poisoning at home. There should be creating awareness about the dangers of such poisons in health and hospital authorities. Poison control center establishment in the region will also help in preventing and controlling such poisoning events. Educational programs for preventive measures for toxic exposures are necessary to create awareness among the public.

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