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ASSESSMENT OF DRUG UTILIZATION PATTERN IN POISONING PATIENT ADMITTED IN TERTIARY CARE HOSPITAL

Nivea [1], Gill Gurkirat Kaur [*2], H. C. Patil [1] and R. K. Patil [1]

Adesh Institute of Pharmacy and Biomedical Sciences [1], Bathinda - 151101, Punjab, India.
Department of Medicine [2], Adesh Hospital, Bathinda - 151101, Punjab, India.

Keywords:

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Correspondence to Author:
Dr. Gurkirat Gill

Assistant Professor,
Department of Medicine,
Adesh Hospital, Bathinda - 151101,
Punjab, India.

E-mail: gurkiratgill04@gmail.com

ABSTRACT: Objective: This study aimed to identify the drug utilization pattern in poisoning patients admitted to tertiary care hospitals and study poisoning patients to determine type of poison cases, demographic character, psychiatric illness, and treatment pattern among poisoning patients. After taking approval from the ethics committee, the study was conducted at Adesh Hospital (AIMSR), Bathinda. **Method:** This study was conducted for 6 months and data were obtained from 65 patients admitted in the hospital with poisoning. In-patient and emergency department drug utilization studies of poisoning patients were studied, and data were recorded in the patient profile form. The recorded data were analyzed as per the objective of the study. **Result:** Poisoning episodes were the majority for suicide in 20-29 years (30.8%). Most of the poisoning cases were due to organophosphorus compound consumption of 28 cases, (43.1%). Antidotes like atropine with pralidoxime (24.6%), Glycopyrrolate (36.9%), and other drugs like antibiotics, steroids, analgesics, antiemetics, proton pump inhibitors, antiepileptic agents, and intravenous fluids were utilized for the management of poisoning cases under study.

INTRODUCTION: Any substance that is hazardous to your body when consumed, inhaled, or absorbed through the skin is considered a poison. Poisons have been employed for various objectives throughout human history, the most popular of which are weapons, anti-venom, and medicine. Illness might emerge immediately following exposure to a poison, or it can take years to develop after long-term exposure. Around 3 million poisoning cases with 2, 20,000 deaths occur annually, according to a WHO (World Health Organization).

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Nearly all of these deaths take place in development countries. Insecticides, rodents, mosquito repellents, kerosene, hair oil, and pharmaceuticals are also used for intentional poisoning due to their easy availability and lack of information.

Academic, financial, social, and familial discords are all sources of stress. However, poisoning instances vary in morbidity and fatality from country to country. According to our country's legal system, all documented poisoning cases are classified as unnatural death or are subjected to a medicolegal autopsy.

In India, pesticide poisoning is a serious problem. In South India, organophosphorus (OP) chemicals are the most common cause of self-poisoning deaths. Poisoning is a common cause of unnatural morbidity and mortality in rural India [1, 4, 5].

Types of Poison:

Organophosphate Poisoning: The most extensively utilized insecticide class nowadays is organophosphate insecticides. More than 40 have been approved for usage, all offering a risk of acute toxicity. Chlorpyrifos, diazinon, parathion, and methyl parathion are some of the most regularly utilized organophosphates. Organophosphates are the most common cause of poisoning. Exposure to multiple organophosphates by multiple routes can lead to serious additive toxicity [2].

Carbamates: Insecticides containing carbamates are commonly used in homes, gardens, and agriculture. Aldicarb, carbaryl, and carbofuran are examples of carbamates. Because carbamates inhibit cholinesterase enzymes, they have comparable exposure symptoms to organophosphates; however, carbamates poisonings are usually less severe [2].

Fungicides: Some of the most catastrophic and widespread cases of pesticide poisoning in the past have been caused by the inadequate use of grain which is treated with organic mercury or hexachlorobenzene. Nowadays number of fungicides cause various types of systemic poisonings. Fungicides as a class, aside from systemic poisonings, are most likely to blame [3, 11].

Phosphine: Phosphine, like methyl bromide, is extremely irritating to the respiratory tract. Ingestion of solid aluminum phosphide has caused the majority of severe acute exposures, with fatality rates between 50 - 90. Nausea, fatigue, headache, thirst, cough, dizziness are common symptoms [9, 12].

Rodenticides: For various reasons, rodenticides represent a particularly high danger of unintentional poisoning. They are designed to kill mammals and some other rodents, and their toxicity comparable to that of humans. Warfarin and other anticoagulant rodenticides were created to solve this problem by developing highly harmful chemicals for rodents but not humans. Rodenticides provide an inherent danger of exposure to humans, particularly children because rodents frequently share human habitats. Finally, because rodents have evolved resistance to existing rodenticides, new and potentially more harmful rodenticides are always being developed [4].

MATERIAL AND METHODS: This was a hospital-based observational study conducted at the In-patient and emergency department of tertiary care hospital after getting approval from the Ethics Committee.

Written Consent in the language (Hindi/Punjabi/English) known to the patient or their guardians was taken before including the patient in this study. Data were collected from patients with poison ingestion via patient profile form containing information regarding poisoning. A total of 65 patients with poison ingestion were included in the study according to the selection criteria.

Assessments of drug utilization patterns in poisoning patients following methods were used:

Sociodemographic: data such as age, gender, level of education, type of occupation, residency, Marital Status, Complaints on admission, type of poison, Route of poison, Time lag between poisoning and hospitalization, Other disease, Previous attempt, First aid approaches, History of psychiatric illness and Cause of poisoning, Types of antidote Types of intravenous fluid, Types of drugs prescribed, Outcome.

RESULTS: The study result is described by graphs and tables distribution according to the percentage and frequency of variables. The result and association of different types of variables studied as follows:

Age-wise Categorization: In this study, out of 65 patients, the maximum number of patients 20 (30.8%) from age group 20-29 years, followed by 6 patients (9.2%) from age under 20 years followed by 13 patients (20.0%) from age group 30-39 years followed by 15 patients (23.1%) from age group 40-49 years while 11 patients (16.9%) from age above 50 years and mean age of all the patients was 33.87.

TABLE 1: DISTRIBUTION OF PATIENTS BASED ON AGE

Age	Frequency N=65	Percentage (%)
<20	6	9.2%
20-29	20	30.8%
30-39	13	20.0%
40-49	15	23.1%
>50	11	16.9%

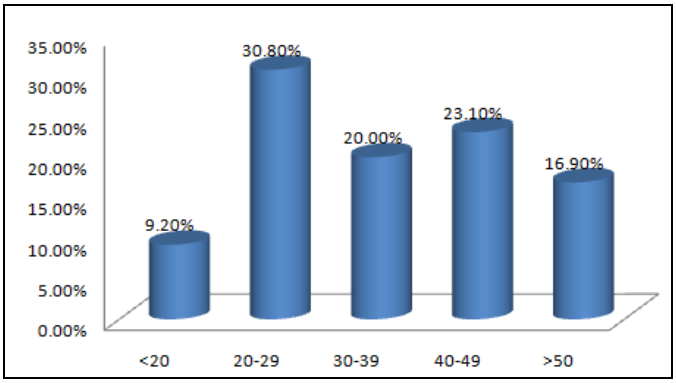

FIG. 1: DISTRIBUTION OF PATIENTS BASED ON AGE

Gender-wise Categorization: A total of 65 patients [48 males (73.8%) and 17 females (26.2%)] were enrolled in the study. The male cases (n=48) outnumbered the female cases (n=17). Out of 48 male patients 06 died, and out of 17 female patients, 01 died.

TABLE 2: DISTRIBUTION OF PATIENTS BASED ON GENDER

Gender	Frequency N=65	Percentage (%)	No. of deaths
Male	48	73.8	06
Female	17	26.2	01

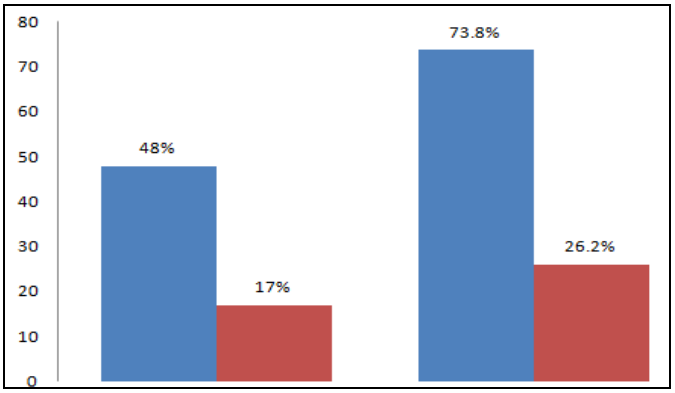

FIG. 2: DISTRIBUTION OF PATIENTS BASED ON GENDER

Incidences of Suicidal and Accidental Poisoning: Based on the incidence of poisoning episodes, the majority were for suicide in 20-29 years (30.8%). The poisoning episodes were the least among those under 20 years (9.2%) and 30-39 years (20%) accidental purpose among the age group 40-49 years and above 50 years (0.015%).

TABLE 3: DISTRIBUTION BASED ON INCIDENCE OF SUICIDAL AND ACCIDENTAL POISONING

Age Category	Suicidal	Accidental
<20	06 (9.2%)	00 (0%)
20-29	20 (30.8%)	00 (0%)
30-39	13 (20%)	00 (0%)
40-49	14 (21.5%)	01 (0.015%)
>50	10 (0.15%)	01 (0.015%)

Categorization Based on Types of Poisoning: Out of 65 patients, there was a high prevalence of Organophosphate poisoning 43.1% (n=28). The next class that reported maximum cases of poisoning was miscellaneous poisoning 30.8% (n=20). Others are herbicides with a frequency of 10.8% (n=7) followed by aluminum phosphide 6.2% (n=4) followed by rat poison 3.1 % (n=2) and 1.5% (n=1) of all others.

TABLE 4: DISTRIBUTION ACCORDING TO TYPE OF POISONING

Type of poisoning	Frequency N=65	Percentage (%)
Organophosphate	28	43.1
Herbicide	7	10.8
Aluminum Phosphide	4	6.2
Rat Poison	2	3.1
Pesticide	1	1.5
Miscellaneous	20	30.8
Unknown	1	1.5
Aluminium Phosphide Powder	1	1.5
Other	1	1.5

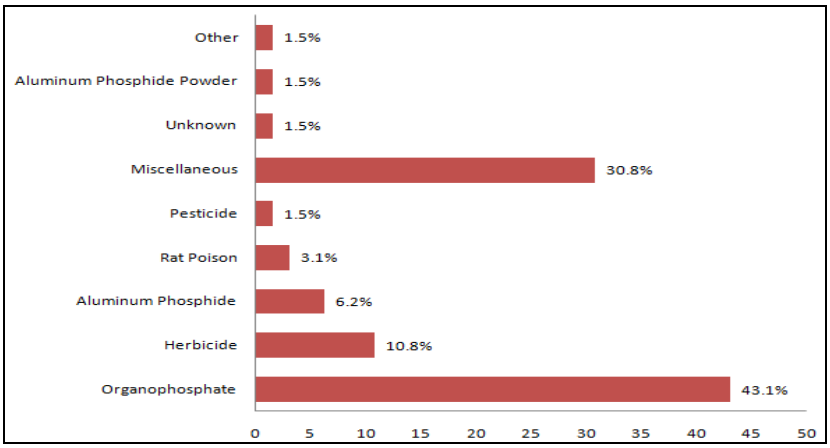

FIG. 3: DISTRIBUTION ACCORDING TO TYPE OF POISONING

TABLE 5: DISTRIBUTION ACCORDING TO GENERAL PARAMETERS IN POISONING CASES

		Frequency	Percentage (%)
Occupation	Student	14	21.5%
	Farmer	23	35.4%
	Labour	14	21.5%
	Private Job	3	4.6%
	House-Wife	11	16.9%
Region	Rural	60	92.3%
	Semi Urban	5	7.7%
Education Status	Illiterate	22	33.8%
	Primary	16	24.6%
	Secondary	19	29.2%
	Higher	8	12.3%
Marital Status	Married	44	67.7%
	Unmarried	21	32.3%
History of psychiatry disease	Stress	24	36.9%
	Depression	40	61.5%
	None	1	1.5%
Cause of poisoning	Marital Discord	16	24.6%
	Family Problem	22	33.8%
	Financial Difficulties	5	7.7%
	Discord With Parents	11	16.9%
	Discord With Children	2	3.1%
	Separation/Death Of Lover	2	3.1%
	Others	6	9.2%
	None	1	1.5%
Route of poisoning	Ingestion/Oral Route	62	95.4%
	Inhalation Route	2	3.1%
	Topical/Dermal	1	1.5%
Other disease	Hypertension	2	3.1%
	DiabetesMellitus	1	1.5%
	Cardiac Disease	2	3.1%
	Others	4	6.2%
	None	56	86.2%

Time Lag between Poison Intake and Hospitalization: Most of the patients reached the hospital within 20-40 minutes 61.5% (n=40). Others are arrived at the hospital with a frequency of 5-20 minutes 27.7% (n=18), 40-60 minutes 3.1% (n=2), and followed immediately 7.7% (n=5).

TABLE 6: DISTRIBUTION ACCORDING TO TIME LAG BETWEEN POISON INTAKE AND HOSPITALIZATION

Time lag between poison intake and hospitalization	Immediately	5	7.7
	5-20minutes	18	27.7
	20-40minutes	40	61.5
	40-60minutes	2	3.1

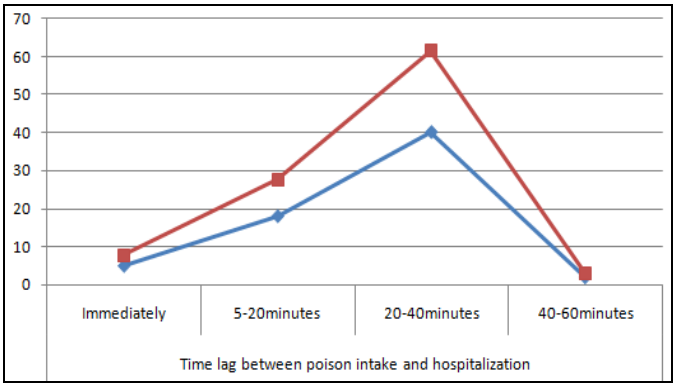

FIG. 4: DISTRIBUTION ACCORDING TO THE TIME LAG BETWEEN POISON INTAKE AND HOSPITALIZATION

Distribution Based on General Measure for Poisoning: Among 65 poisoning cases under study, general measures performed in maximum were gastric lavage and Ryle's tube aspiration in 45 cases (69.2%), respectively. Other general measures performed include oxygenation in 20 cases (20%) respectively.

TABLE 7: DISTRIBUTION BASED ON GENERAL MEASURE FOR POISONING

General Measure	Frequency	Percentage
Gastric lavage+Ryle's tube	45	69.2
Gastric lavage+Ryle's tube Oxygenation	20	30.8

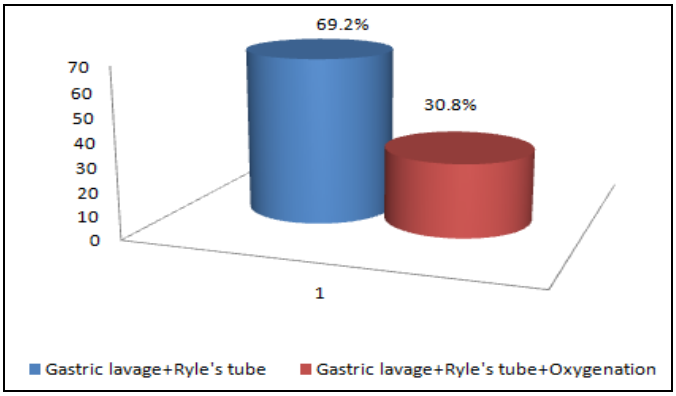

FIG. 5: DISTRIBUTION BASED ON GENERAL MEASURE FOR POISONING

Drugs Prescribed for Poisoning Cases: Of the 65 poisoning cases most utilized drug is pantoprazole 53 (81.5%) followed by intravenous fluid as a supportive measure.

The most antidotes were Glycopyrrolate 24 (39.6%), then atropine and pralidoxime 16 (24.6%), respectively.

TABLE 8: DISTRIBUTION ACCORDING TO DRUGS PRESCRIBED FOR POISONING CASES

Drugs	Frequency	Percentage%
Metronidazole	24	36.9%
Ondansetron	53	81.5%
Pantoprazole	53	81.5%
Cetriaxone & Salbactum	27	41.5%
Atropine	36	55.3%
Glycopyrrolate	38	56.4%
Multivitamin	37	56.9%
Diclofenac	33	50%
DNS	26	40%
Diazepam	16	23%
Pralidoxime	26	40%

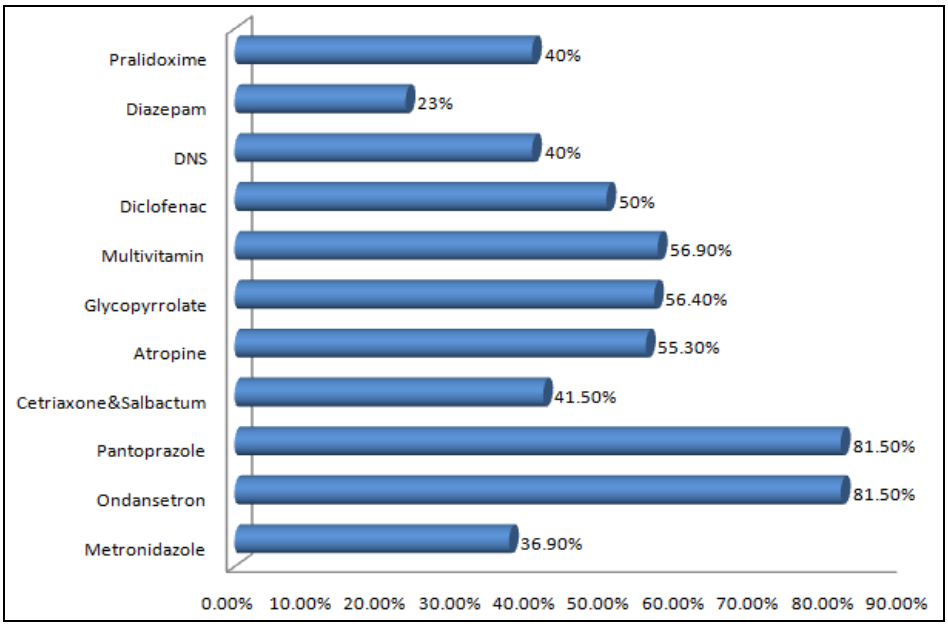

FIG. 6: DISTRIBUTION ACCORDING TO DRUGS PRESCRIBED FOR POISONING CASES

Distribution According to Outcome: Out of 65 patients admitted in hospital with different types of poisoning about 72.3% (n=47) of the patients were fully recovered, followed by 15.4% (n=10) of patients that were discharged against medical advice followed by 10.8% (n=7) of patients were died and 1.5% (n=1) partially recovered.

TABLE 9: DISTRIBUTION ACCORDING TO OUTCOME

Outcome	Frequency	Percentage (%)
Partially Recovered	1	1.5
Fully Recovered	47	72.3
Died	7	10.8
Discharge against medical advise	10	15.4

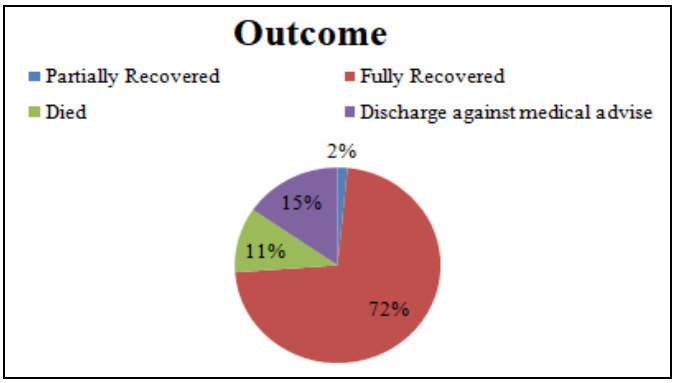

FIG. 7: DISTRIBUTION ACCORDING TO OUTCOME

DISCUSSION: In this present study, a maximum young age group between age 20-29 years (30.8% was found, which is similar to showed by Raffiudin

et al. (2017) and Dileep *et al.* (2017) in their study. Most patients (33.8%) were illiterate in this study compared to another study shown by Raffiudin *et al*. They showed that most patients (62.2%) were illiterate in their study [7, 18]. In this study, According to gender, the majority of males (73.8%) as compared to females (26.2%) had higher exposure to the poison, which is similar as showed by Raffiudin *et. al* (2017) represent majority have males (60.57%) more exposed to poison and minority of females (39.5%) was shown by this study [7]. In this study, majority of patient ingested poison *via* oral route (95.4%) which is similar showed by Raul *et al.* (72.5%) in their study [14].

In this study, the Highest Prevalence of Organophosphate poisoning was 43.1% (n=28) compared to the study conducted by Kulkarni et al., representing 32.5% in their study [17]. In this study, majority of the married patient (67.7%) more prone to poison intake which is similar shown by Revathi *et al* shown in their study (49.6%) [19]. In this present study, Suicidal poisoning was about 96.9% (n=63), which was found similar, as shown by Revathi *et al.,* 69.9% in their study [19]. In this study, Among the intravenous fluids, Normal Saline 21.5% (n=14) was the most commonly prescribed in patients, which is similar showed by Sasidharan *et al.* (38.97%) in their study. In the majority of patients suffering from poison ingestion were given Cetriaxone & Salbactum with a frequency of 18.5% (n=12), which is similarly showed by Dileep et al. reports 17.38% antibiotics such as Cetriaxone & Salbactum in their study. In the majority of patients, gastric lavage was done with a frequency of (69.2%) which is similarly shown by Sasidharan *et al.* (38.1%) in their study. The majority of the patient mainly use Pantoprazole+Ondansetron with frequency of (81.5%) and vitamin and mineral preparation with a frequency of (18.5%) which is similarly shown by Sasidharan *et al.* in their study [2, 18].

CONCLUSION: Poisoning is the most common cause of death in underdeveloped countries. Pesticide poison is the most common cause of suicidal poisoning. In the present study, the younger males with rural backgrounds were more vulnerable to poisoning. According to the study's findings, it has been clear that there is an increase in high incidence of poisoning cases, of which suicidal poisoning has been recorded. Organophosphate poisoning was the most common poison consumed, followed by miscellaneous and others. These are mainly used for poisoning due to their easy availability, lack of knowledge, and financial difficulties. It was revealed from the present study that male cases outnumbered female's cases. The most common mode of poisoning is by ingestion. Depression is one of the commonest psychiatric diagnoses related to suicide. The most common cause of poisoning in the population was marital discord and family problems. Symptomatic and supportive care was the mainstay of management. The study showed that the most common single antidote therapy was used for all types of poisoning. Mostly Rational therapy is prescribed to patients.

Recommendations: This study has highlighted the need to establish a poison information center for the better management & prevention of poisoning cases**.** Patients with intentional poisoning must undergo psychiatry consultation during their stay in the hospital, which will minimize the risk of the next attempt of self-harm. According to our study, providing educational and awareness programs, establishing surveillance centers and regulations on pesticide availability and their proper storage leads to decreased incidence of poisoning.

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