International Journal of Pharmacy Teaching & Practices 2014, Vol.5, Issue 1, 905-909.

Importance of Poison Information Centre and Role of a Pharmacist in Management of Poisoning

Amit Sharma*, Vinay Pandit

Department of Pharmacology, Laureate Institute of Pharmacy

Research Article

Please cite this paper as Amit Sharma*, Vinay Pandit Importance of Poison Information Center and Role of a Pharmacist in Management of Poisoning. IJPTP, 2014, 5(1), 905-909.

Corresponding Author:

Amit Sharma

Dept of Pharmacology, Laureate Institute of Pharmacy, Kathog, Dehra Himachal Pradesh, India.

E-mail: amit.clinical@yahoo.com

Mobile : +919736022382

Abstract

Poison is a substance capable of producing damage or dysfunction in the body by its chemical activity. Poisoning can be accidental or intentional. In many parts of the developing countries pesticide poisoning, food poisoning, drug over dose, insecticidal poisoning, chemicals and cosmetics poisoning, animals and plants poisoning causes more deaths than infectious diseases. Poisoning with the Organophosphate pesticide is responsible for the majority of deaths in most cases, particularly those from rural areas. Easy accessibility and low cost of the pesticides is one of the common reasons of self-poisoning. Self-poisoning with plants parts, although uncommon globally, is locally popular in some regions. Poisoning may be an attempt at suicide in depressed persons. Other higher groups include the elderly, hospitalized patients, drug errors, workers exposed to occupational chemicals and persons exposed to environmental pollution. Regulating availability of pesticides and improving medical management could have a rapid effect on deaths from self-harm in rural areas. Information and identification of certain products like household products, corrosives chemicals, Industrial chemicals, poisonous plants, animal poisoning (Snakebite, scorpion, spider bite), and look alike products may help in management of poisoning. Management of poisoning is one of the biggest challenges facing by the physicians at present globally. The branch of Department of Pharmacology, Laureate Institute of Pharmacy in collaboration with selected hospital, made the Brochure and leaflets which include the First aid of poisoning, poison prevention tips, identification and presentation of the different animals and poisonous plants in India, which will help in management of poisoning.

Keywords: *self-poisoning, Pharmacoinformatics, Poison control, Pharmacy services*

Introduction

A Poison is any substance that causes harm if it gets into the body. Harm can be mild (for example, headache or nausea) or severe (for example, fits or very high fever even death) and several poisoned may die. The word poison comes from the Latin word - potare - meaning to drink.

Poisoning is the harmful effect that occurs when a toxic substance is swallowed, is inhaled, or comes in contact with the skin, eyes, or mucous membranes, such as those of the mouth or nose. Poisoning, either accidental or intentional is a common cause of admission at accident and emergency departments. Almost any chemical can be a poison if there is enough in the body. Some chemicals are poisonous in very small amount. (For example a spoonful by mouth or a tiny amount injected by snakebite.) Others are only poisonous if a large amount is taken.[1]

The amount of a chemical substance that gets into the body at one time is called the dose. A dose that causes poisoning is a poisonous dose or toxic dose. The smallest amount that causes harm is threshold dose. If the amount of a chemical substance that gets into a body is less than the threshold dose, the chemical will not cause poisoning and may even have good effects. For example, medicines have good effect if people take the right dose, but some can be poisonous if people take too much.[2]

Exposure to a poison

When people are in contact with a poison they are said to be exposed to it. The effect of exposure depends partly on how long the contact lasts and how much poison gets into the body, and partly on how much poison the body can get rid of during this time. Exposure may happen only once or many times. Acute exposure is a single contact that lasts for seconds, minutes or hours, or several exposures over a day or less. Chronic exposure is contact that lasts for many days, months or years. It may be continuous or broken by periods when there is no

contact. Exposure that happens only at work; for example, is not continuous.[3]

Terminology

Some poisons are also toxins, usually referring to naturally produced substances, such as the bacterial proteins that cause tetanus and botulism. A distinction between the two terms is not always observed, even among scientists. The derivative forms "toxic" and "poisonous" are synonymous[4].

Signs and symptoms of poisoning can imitate signs and symptoms of common illnesses.

- For example, nausea and vomiting are a sign (vomiting) and symptom (nausea) of poisoning. However, nausea and vomiting can also be found in many illnesses that have nothing to do with poisoning. Examples include: stroke, heart attack, stomach ulcers, gallbladder problems, hepatitis, appendicitis, head injuries, and many others.
- Almost every possible sign or symptom of a poisoning can also be caused by a non–poison-related medical problem
- Over the counter medications are not safe even if taken in excess.
- With many pills, it may take several hours or longer for symptoms to develop. Do not wait for symptoms to develop, rush the patient to the nearest hospital.
- If someone looks ill after a poisoning or possible poisoning. Take the person to the nearest emergency department of a hospital.
- An infant or toddler who may have ingested a poison, even if the child looks and feels fine.
- Anyone who has taken something in an attempt to harm him or herself, even if the substance used is not known to be harmful.
- When you go to the hospital's emergency department, take all the medicine bottles, containers (household cleaners, paint cans, vitamin bottles), or samples of the substance (such as a plant leaf) with you.
- There has been a structural change in the brain, such as a stroke[5].

Recognition of the problem of poisoning and of the need for specialized facilities to deal with it, as well as the existence of a number of health care professionals concerned with human toxicology, has invariably been the primary pre-requisite for the establishment of poison information centre. The first centre was instituted in North America and Europe during 1950s. Since then, many others have been created, principally in the industrialized countries. The early poison information centre originated in a wide variety of fields including pediatrics, intensive care, forensic medicine, occupational health, pharmacy, and pharmacology. To some extent, the original character of many poison information centres has been maintained, and there is thus considerable heterogeneity in their structure and organization.[6]

A global study undertaken during the period 1984-1986 indicated that, while most developed countries had well established facilities for poison control, this was rarely the case in developing countries. Furthermore, in industrialized countries, there may be a number of institutions that provide different types of information on toxic chemicals. It must be remembered however that each ministry or agency in a developed country may have its own information services for its specialized needs, but that, in a developing country, the poison information center where it exists may be the only source of information on toxic chemicals available 24 hours a day. Centers in developing countries may therefore have to provide a much broader toxicological information service than their counterparts in some developed countries[7].

Poison information centre may operate effectively with various types of organizational structure. The majority depends on a hospital administration and are, to some extent, connected with a university and with the country's public health service at national or regional level[8].

The poison information centre is a specialized unit providing information on poisoning, in principle to the whole community. Its main functions are provision of toxicological information and advice, management of poisoning cases, provision of laboratory analytical services, toxicovigilance activities, research, and education and training in the prevention and treatment of poisoning. As a part of its role in toxicovigilance, the centre advises on and is actively involved in the development, implementation, and evaluation of measures for the prevention of poisoning. In association with other responsible bodies, it also plays an important role in developing contingency plans for, and responding to, chemical disasters, in monitoring the adverse effects of drugs, and in handling problems of substance abuse. In fulfilling its role and functions, each centre needs to co-operate not only with similar organizations, but also with other institutions concerned with prevention of and response to poisoning[9].

The purpose of the study was to support the health care professionals in the identification and management of poisoning cases, Analysis of this study data helps to update guidelines for various poisons as well as the availability of the specific antidote, depending on the region and to find out the prevalence of the type of poisoning and existing treatment option currently available.

Material and Method

Informed consent was obtained from the conscious patients or from their relatives if the patients were unconscious. The study was conducted for a period of 9 months.

Study criteria

Inclusion Criteria

- All in-patients admitted due to poisoning in Medicine Intensive Care Unit and who were willing to participate in the study.

Exclusion Criteria

- All out-patients.
- Patients who were not willing to participate in the study.
- Poisoning due to long-term ingestion of drug.

Source of Data

Data was collected from case sheets, lab reports and prescriptions of poisoned patients admitted in MICU.

The investigator have participated in the ward rounds, identified the poisoning cases and collected the data. A visit to emergency ward was given each day to check for any new cases. Details of each poisoning case was recorded in the data collection form which included details of age, gender, region, literacy levels, occupation, marital status, habits, past history, month & time of exposure to poison, nature of poisoning, route of exposure, reasons for intentional poisoning, type of poison consumed, signs & symptoms, form of poison, treatment given before admission, current treatment including antidotes, lab reports, length of hospital stay and patient status after treatment.

Result and Discussion

During the study period of 9 months, number of individuals who got admitted to Medical Intensive Care Unit due to poisoning were 55 patients.

The age of patients ranged from 12 to 84 years. Majority of the patient's age ranged from 12-60 years followed by geriatric [above 60 years] and there was just one case [1.8%] in pediatrics. The maximum numbers of cases [41.81 %] were in the age group between 19-30 years as this age group is more prone to stress and challenges in life. Among 55 patients who got admitted due to poisoning, 29(52.7%) were male and 26(47.3%) were female. Majority of the cases i.e. 97% were from the urban area and 3% were from the rural area. This represents the increased stress of rapid urbanization.

The number of patients with primary education and more constituted 80% where as 20% of the patients were illiterate. The nature of work of the individuals who consumed poison varied from a simple laborer [1.8 %] to businessmen [49 %], students [29.8%] and housewives [18.28 %]. Unemployed youth constituted 1.8 %. Businessman topped the list followed by students and housewives which correlates well with the reasons submitted by the patients for consuming poison. 68% of the people were married, 29% were single followed by 3.6% widows.

The number of patients who were alcoholic was 29 [52.72%], out of which 27(93.1%) were male and 2(6.89%) were female. Smokers were 19 [34.54%] patients, out of whom 17(89.47%) were male and 2(10.52%) were female. 7 [12.74%] patients were neither smokers nor alcoholic, out of which 2(28.57%) were male and 5(71.42%) were female. Intentional poisoning was more with alcoholic male patients. Although majority of cases [73%] were first time poisoning ,19% of the cases was found to be second time and for 5.5%, it was third time which might indicate an underlying psychiatric illness in those patients with suicidal tendencies. Number of admissions month wise indicates many admissions due to poisoning in December followed by January, October & November. However, significance of this in our study is unclear.

About 55 % cases were admitted in the night and 45 % during the day.

Table-1: list of Organophosphorous compound consumed

Trade name	Generic name	Class & category	Number	Percentage
Cyfos Cybil Contaf Cyfos	Chlorpyrifos	Pesticide	13	39.39
Cycothate	Dimethoate	Insecticide	3	9.09
Acet Acetaf Torpedo	Acephate	Insecticide	4	12.12
Tic -20	Fenithrothin	Insecticide	6	18.18
Demcos	Demeton Methyl	Insecticide	2	6.06
Decis	Diazinon	Insecticide	1	3.04
Cythion	Malathion	Insecticide	4	12.12

Table –2 : list of Drugs consumed

TRADE NAME	GENERIC NAME	CLASS & CATEGORY	N	%
Calmpose Larpose	Lorazepam Nitrazepam	CNS depressant	6	31.56
Alprex	Alprazolam	CNS depressant	3	15.79
Dolo	Acetamenophen	Analgesic and Antipyretic	3	15.79
Imol	Ibuprofen	Analgesic	3	15.79
Disprin	Aspirin	Anti-Inflammatory	2	10.54
		Antispasmodic	2	10.54

Out of 55 cases, 53 [96.4 %] were intentional poisoning and 2 [3.6%] were accidental poisoning. This finding is similar to the report by S.K. gupta et al.[10] In 54 cases the poison was consumed orally and one case taken intravenously.

The poisons consumed were Organophosphrous compounds {Pesticide and Insecticide} 60%, overdose of drugs 34.5 % and cosmetics 1.8 %. Unidentified poison amounted to 3.60 %. Among OP compounds, Insecticides constituted 76.4%.

The reasons for intentional poisoning were found to be financial [52.7 %] followed by emotional disturbance [29 %], and family problems [18.2%].

The amount of poison consumed was known in 75% of cases whereas in 27% it was not known as patients were unconscious and not in a position to

Table-3- Signs and Symptoms of patients

Signs and Symptoms	Number of patients	Percentage*
Gastrointestinal (GI)	34	61.81
CNS	32	58.18
CVS	39	71.00
Respiratory	43	78.18
No symptoms	4	7.27

***There was overlap of signs and symptoms in few cases**

tell. The high incidence of poisoning due to pesticides and Insecticide is [60%], [34.5%] cases were due to overdose of drugs consumed namely Diazepam, Acetaminophen, Diclofenac, Asprin, and Dicycloverine HCL. Out of these drugs CNS Depressants were 48% followed by Analgesic and Antipyretics 31.5 % and Antispasmodics drugs 10.52 %.

Out of 55 cases, neuromuscular symptoms involving CNS such as headache, dizziness, confusion, depression, irritability were seen in 52.2 %, GI symptoms such as nausea, vomiting, stomach cramps and stomach ache was seen in 61.81 %, CVS symptoms such as hypertension and hypotension were seen in 71 % of cases, respiratory symptoms such as breathlessness amounted to 78.18 % and 7.27 % patients presented with no symptoms, however there was considerable overlap of symptoms in patients.

The specific antidotes were used in 81.82% % of the cases. The specific antidotes that were used most frequently are Atropine [47.27 %], followed by PAM [29.09 %], N-Acetyl cystine [5.45 %]. General antidote such as charcoal was used in [18.18%] of the cases.

Table- 4: Commanly used Antidotes

Antidote used	Number	Percentage
Atropine	26	47.27
Pralidoxime (2-PAM, Pyridine Aldoxime)	16	29.10
N-acetyl cystine	3	5.45
Charcoal	10	18.18

The concurrent medication prescribed were analgesics [83.63%] followed by antibiotic s [63.63%]. All the patient were given supportive management such as antacids and antiulcer medication, IV fluids, and oxygen therapy

Table -5: Concurrent Medications Prescribed for Treatment

Concurrent Medication	Number	Percentage
Analgesics	46	83.63
Antibiotics	35	63.63
Antiemetics	48	87.27
Antiulcers	36	65.45
CNS depressants	10	18.18
Diuretics	48	87.27
Nutritional supplements	50	90.90
Supportive therapy	52	94.54

In case OP poisons, strength of the antidote administered was adjusted on the basis of clinical condition of the patients. Whereas in drug poisoning drug specific antidote was given [e.g. Flumazenil was administered in case of benzodiazepine poisoning, N-acetyl cystine was administered in acetaminophen poisoning etc]. In case of low dose drug poisoning e.g. Aspirin, it did not require alkali treatment and was managed by the supportive therapy. Out of 55 cases, 54 patients were recovered and one patient expired because he was not able to reach on time for treatment.

Table -6- Lab reports of patients

Lab parameter	Number of patients	%
Increase in Blood count	7	12 .73
Increase in blood count & Pseudocholinesterase	12	21.82
Increase in ESR & blood count	13	23.64
Normal lab reports	22	40
Lab report not available*	1	1.81

***Patient expired**

The duration of stay in the hospital varied from three to thirty days depending on the type of poison. In case of Organophosphrous poisoning, hospitalization days ranged from 7 to 20 days with a mean of 10-15 days. Those who develop respiratory failure were put on ventilators. The mean stay was 15 days. Most of the patients showed increase in blood count [23.6%] followed by decrease in Pseudocholinesterase [21.8%] in the cases of OP poisoning, whereas 40% of the patients showed the normal laboratory reports. Toxicology screen showed increase in blood count positive for benzodiazepine in case of benzodiazepine overdose.

All cases were admitted to MICU for observation and after recovery were discharged after psychiatric counseling.

References

1. Henry JA, Wiseman HM. General information on poisons and poisoning. In: Management of poisoning: A handbook for health care workers. New Delhi: AITBS publishers; 2004: 3-11.
2. Henry JA, Wiseman HM. How poisoning happens. In: Management of poisoning: A handbook for health care workers. New Delhi: AITBS publishers; 2004: 13-18.
3. Chatterjee B, Banerjee DB. Accidental poisoning in children. Indian Journal of Pediatric 1981; 18: 157-62.
4. Reddi YR, Rajeswaramma V. Accidental kerosene poisoning in infants and children. Indian Journal of Pediatric 2004; 4: 141-44.
5. Singh D, Tyagi S. Changing trends in acute poisoning in Chandigarh zone: A 25 years autopsy experience from a tertiary care hospital in northern India. Am J Forens Med Pathol. 1999; 20: 203-10.
6. Roberts DM, Karunarathna A, Buckley NA, Manuweera G, Sheriff MH, Eddleston M. Influence of pesticide regulation on acute poisoning deaths in Sri Lanka. Bull World Health Organ. 2003; 81(11): 789-98.
7. Singer CM. Child & Adolescent Psychiatry. In: Goldman HH, editor. Review of General Psychiatry. California: Lange Medical Publication; 1984: 642-48.
8. Tandon GU, Qureshi, Panday DN, Agarwal Ajay A. Profile of poisoning cases admitted in S.N. Medical college hospital, Agra. Journal of Forensic Medicine & Toxicology. 1996; 8: 10-12.
9. Gupta SK, Peshin SS, Srivastava A, Kaleekal T, Pandian TV. Epidemiological patterns of poisoning in India. Pharmacoepidemiology & Drug safety 2002; 11: 73-74.
10. Gupta SK. National Poison Information Center, All India Institute of Medical Sciences [AIMS]. 2001 Dec; 1(1).

AUTHORS' CONTRIBUTIONS

Authors contributed equally to all aspects of the study.

PEER REVIEW

Not commissioned; externally peer reviewed.

CONFLICTS OF INTEREST

The authors declare that they have no competing interests.