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Clinical Profile of Poisoning Cases in a Tertiary Care Hospital –A Retrospective Study

Badiadka KK[1], Pramod KL[2], Hashim A[3], Kishor Kumar B[1]

[1]Professor and Head, [2]Assistant Professor, [3]Lecturer/Toxicologist, Department of Forensic Medicine and Toxicology, Yenepoya (deemed to be University), Mangalore, Dakshina Karnataka, India

Abstract

The present study was carried out to determine the clinical profile of patients presenting with the history of poisoning admitted to the casualty in a tertiary care hospital.The commonest agents involved in the poisoning were due to pesticides followed by therapeutic drugs, of these majority of cases, involved anti-inflammatory, analgesic, anti-histamines followed by Sedatives/ hypnotics; accounted for almost half. Among the pesticides, maximum poisoning was due to organophosphates followed by zinc phosphide. It is important to know the nature of poisoning in order to take appropriate preventive measures. Therefore, the knowledge of the general pattern of poisoning in a particular region will be a useful tool in planning and management/proper treatment of critically ill poisoning cases.

Key words: -*Poison, Organophosphorus, Drugs, volatile poisons.*

Introduction

Poisoning is an important common medical emergencyin developing countries, resulting in hospitalization, utilization of health care resources and high mortality. 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.Various agents such as insecticides,rodenticide, causativesand drugs have been used for intentional and accidental poisoning in different parts of southern India(1). The problem is getting worse with time as newer chemicals and drugs are developing in huge numbers. Information available is limited, including hospitalized patientsbecause of poor regulations and limited health care services in our country. The present study was carried out to assess the types, prevalence and incidence rate due to various poisoning agents and also to determine the demographic and clinical profile of patients presenting with the history of poisoning to the casualty. It is important to know the nature and severity of poisoning in order to take appropriate preventive measures. Therefore, the knowledge of the general pattern of poisoning in a particular region will be a useful tool in planning and management/appropriate treatment of critically ill poisoning cases.

Corresponding author:
Hashim. A
Lecturer/Toxicologist, Department of Forensic Medicine and Toxicology, Yenepoya Medical College Yenepoya deemed to be University, Derelakatte, Mangalore, Karnataka, India - 575018
Email: - mhdhashim@gmail.com
Mob no. +91 9742555052

Methodology

The retrospective analysis of poisoning cases was conducted in the Department of Forensic Medicine and Toxicology, after obtaining ethical clearance from the Ethics committee, Yenepoya deemed to be university during the period of April 2012 to March 2017. A total of 284 cases of poisoning from 2670 entries were obtained during the study period.

Statistical analysis: - data was coded and analysed

using SPSS 23 Version,

Results

A total of 284 cases of poisoning were classified under 10 categories as shown in Table 1.The most commonest poisoning were due to pesticides, 96 cases (33%) followed by therapeutic drugs 51 cases(18%);Of these 21 (41%) cases were anti-inflammatory, analgesic, anti-histamins followed by Sedatives/ hypnotics 17 (33%). In pesticides, maximum poisoning was due to organophosphates,43 cases (44%) followed by zinc phosphide 36 cases (37%).

Gender

Of the 284 cases 146 (51%) were male and 138 (48.0%) female, in this study the youngest patient was 07 years old, while the oldest patient was 68 years old.

Routes of exposure

Among the various routes of exposure, ingestion was the, most common, followed by inhalation and contact.

Common substances in human exposures

The four most common toxic agent groups, in decreasing order, werepesticides, therapeutic drugs, hydrocarbons, Cleaning/house hold chemical, animal bites and stings, plant poisons, volatile poisons, personal healthcare products and unknown substances.

Table 1- Distribution of poison cases under different categories

SI No.	Type of poison	No. of cases
1.	Agricultural poison	96 (33.8%)
2.	Therapeutic drugs	51 (17.95%)
3.	Organic Irritants	38 (13.38%)
4.	Volatile poisons	37 (13.02%)
5.	Corrosive poisons	26 (9.15%)
6.	Neurotoxic poisons	8 (2.81%)
7.	Metallic poisons	3 (1.05%)
8.	Abusing drugs	2(0.7%)
9.	Miscellaneous poison	2 (0.7%)
10.	Unknown	21 (7.39%)
	Total	284

Poison cases were categorised into 10 groups based on their similarity, chemical, physical, origin and mode of action.

Agricultural poisoning

Agricultural poisoning showed an increasing trend from 2012 to 2016but decreased in 2017. A total of 96 cases were observed to have pesticide poisoning. Of these cases, the predominant pesticide poison taken was organophosphorus compounds i.e. 43 cases (44%) followed by rodenticide 36 (37%), Pyrethrim/ Pyrethroids 7 cases (7%), paraquats 3 (3%) and other pesticides 3(3%). A higher number of men 63cases

(65%)than women 33 cases (34%) had pesticide poisoning. Among agricultural poisoning 34 (79%) of organophosphorous victims were male and in Pyrethrim/ Pyrethroids compound poisoning victims were female 5 (71%).

Majority of the organophosphorus poisoning were reported in 2016, 10 cases followed by 2014 (8 cases) and 2012 (10 cases). Second cause for pesticide poison is rodenticide. Total of 36 cases were reported highest number of cases were reported in 2014 (16) and most of victims weremale 21 (17.8%).

Table 2- Distribution of poison cases under Agricultural poisons

Types of poisons	Description of poison	No. of cases
Agricultural poisons	Organophosphorus	43 (44.79%)
	OrganochlorineDDT	4 (4.16%)
	Paraquat– herbicide	3 (3.12%)
	Carbamate – Hit Spray	3 (3.12%)
	Pyrethrim/ Pyrethroids/ mosquito repellents Good night	7 (7.29%)
	Zinc phosphide rat poison	36 (37.5%)

Large number of cases were registered under Organophosphorus followed by Zinc Phosphide

Therapeutic drugs

Therapeutic drug poisoning showed a slight increase during the 5-year study despite a high number in 2014 (9 cases). A total of 51 cases involved therapeutic drug poisoning. Of these cases, 21 (41%) involved anti-inflammatory, analgesic, anti-histamins followed by Sedatives/ hypnotics 17 (33%), which were the most commonly used medicines. Over the counter medicine like Iron tablet/vitamin/calcium/rantac/pantoprazole/ MTP Pills was of 6 (1%). The rate of analgesic and psychotropics poisoning decreased over the 5-year period. Over the counter medicines showed a relatively stable trend. However, drug poisoning was significantly more frequent in women than in men (31.8% vs 9.3%). Sedative/hypnotics and pain killers was mainly used by female (9.1% and 14.3%) than male (4.2% and 1.7%). This results indicates that either therapeutic drugs were taken mistakenly or in overdose by women for suicidal purposes.

Table 3- Distribution of poisoning cases under Drugs

Types of poisons	Description of poison	No. of cases
Drugs	Iron tablet/vitamin/calcium/rantac/pantoprazole/MTP Pill	6 (1.17%)
	Diazepam Group/Alprax/antidepresssant/ Clonazepam/ lorazepam/ Anipsychotic	17 (33.33%)
	Pain killer/ PCT/Diclofenac/CPM	21 (41.17%)
	Tincture iodine	1 (1.96 %)
	Chloroquine Sulphate	1(1.96 %)
	Chlorpromazine/Trihexiphendyl	2 (3.92 %)
	BP Tablet	2(3.92 %)
	Carbamazepine (anti convulsents)	2(3.92 %)
	Phenylacetate	1(1.96 %)

Highest percentage seen in usage of pain killers, diazepam groups, and Vitamins

Organic irritants

Plant poisons

Among 10 plant poisoning cases reported 9 cases were due to poisonous mushrooms (23%) and other one was due tocardiotoxic plant called nerium 1 (2%).

Animal bite and stings

i. Snake bites

A total of 21 cases was reported out of which 19 (90.5%) victims were male and 2 (9.5%) victims female. Fang marks were present in 16 cases. Out of 21 cases only 1 patient died due to poisoning (unidentified venomous snake).

ii. Insect stings

Wasps, honeybees, scorpions, centipedes were responsible for the majority of stings. A total of 7 cases were reported. Most of the victims were male 4 (75%) and a few were female 3 (66.7%). Bite marks were seen in all the cases and no causality has been reported.

Volatile poisons

A total of 37 cases were reported. Majority of the poisoning were due to kerosene 24 (64%) remaining of them due to ammonia, petrol and diesel, with majority of victims being females.

Table 4- Distribution of poison cases under Volatile poisons

Types of poisons	Description of poison	No. of cases
Volatile poisons	Kerosene	24 (64.86%)
	Petrol	2 (5.4%)
	Diesel	2(5.4%)
	Ammonia	6 (16.21%)
	Paint/thinner	3 (8.1%)

Highest percentage seen in cases of kerosene,

Ammonia followed by thinner.

Corrosives

Poisoning due to house old chemicals containing causatives/bleaching agents showed an increasing trend from 2012 to 2017. A total of 26 cases related corrosive acids were reported. Out of it most common poison is floor cleaner 19 (73%). Most of victims were female 17(65%). Highest number of cases have been reported in 2015 (8).

Neurotoxic poisons

A total of 8 cases of alcohol intoxication has been reported and all victims were male

Metallic poisons

Poisoning due to heavy metal i.e. copper sulphate have been reported

Abusing drugs

Two cases of cannabinoids abuses were reported on this category

Miscellaneous poisoning

Personal healthcare products

Twounusual poisoning under personal healthcare products were reported in this study. One is due to hair oil and other one due to sebin lotion, victims are 1 male (0.8%) and 1 female (0.8%)

Unknown poisons

About 21 unknown poisoning cases were reported, Majority of victims being female.

Discussion

Poisoning cases are increasing day-by-day due to changes in life style and social behaviour. Various agents such as pesticides, drugs have been used for intentional and accidental poisoning in different countries. In a developing country like India poisoning is a major health problem. In the Indian scenario, pesticides are the most commonly used poisoning agents.Thus a detailed knowledge about the nature, clinical profile of poisoning is important for early diagnosis and prompt treatment. Here poison cases were categorised into 10 groups of descending order based on their similarity, chemical, physical, origin, mode of action and frequency (Tab. 1). In this study we found that most of the victims were male (51%) than female (48.0%) which was similar to the findings of Ramesha KN*et al.*(2009)[2],Güloğlu C*et al.* (2005)[3]Singh B*et al.*(2006)[4]andAnthony L*et al.* (2012)[5]. In the present study the route of exposure was ingestion followed by inhalation and contact. Zhang Y, *et al*. (2018)[6] did a study inShengjing Hospital, China and found that the most common form of poison intake was ingestion.

Among agricultural poison organophosphorus compounds was the most common cause of poisoning (44%) followed by rodenticide (37%) andPyrethrim/ Pyrethroids(7.9%) (Tab. 2). The place of study is in rural area involving agriculture as one of the occupation and alsohaving coconut and areca nut plantation. For protection of crops almost every house has pesticides which could be a reason for its easy access to the victims. The findings of the study is in agreement with the study done by Ramesha KN*et al.*(2009)[2] and Ahuja H*et al*. (2015)[7]. A retrospective study covered 15 years and found that commonest agents were organophosphorus compound (35.1%) and aluminum phosphide (26.1%) Murali R *et al.* (2009).[8]

Agricultural Poisoning victims included 52% Male & 26% Female as also reported by Kumar MR *et al.*(2014) [9]. Another study observed that organophosphates, rat poison were the commonly encountered poisoning agents mainly in adults possibly with suicidal or para-suicidal intention. Abula T*et al.* (2006)[10]. The rampant use of agricultural poisons in our country, the ease of their availability, their low cost are probably some of the reasons for its poisoning.

Therapeutic drugs has shown second largest cause of poisoning in this study.A total of 51 cases involved therapeutic drug poisoning. Of these cases, 21 (41%) involved anti-inflammatory, analgesic, anti-histamins followed by Sedatives/ hypnotics 17 (33%), which were the most commonly used drugs (Tab. 3).Drug poisoning was significantly more frequent in women than in men (31.8% vs 9.3%).This result is supported by Anthony L *et al.*(2012)[5]. Singh B*et al.*(2006)[4] studied the pattern of poisoning cases in Mangalore, India and found that the most important agents of acute poisoning

were agrochemical pesticides (49%) followed by drugs (17%). Similar findings were reported by Avsarogullari L *et al.*(2012)[11]. Zhang Y, *et al*. (2018) [6] andShadnia S*et al.*(2016) [12]

A total of 21snake bites cases was reported out of which 19 (90.5%) victims were male and 2 (9.5%) female. Fang marks were present in 16 cases. Out of 21 cases only 1 patientdied due to poisoning (unidentified venomous snake).Eslamian L*et al.* (2016)[13] did a retrospectives study of 160 cases of snake bite over a period of 10 year period, of which 128 (77.6%) were male and same result was also observed by other researchers too (Otero R*et al.,*(2002) [14] ; Brunda G*et al.*(2007)[15] andJamaiah, I *et al.*(2006)[16]. Malangu N.*et al.*(2008) [17] studied the acute poisoning cases admitted to two hospitals in Kampala, Uganda and reported 14.1% cases of snake bite. There is an increasing incidence of snake–bite with the expanding encroachment of land space by human settlement(Banerjee RN*et al.*(1978)[18] and the peak number of snake-bite cases were seen during June-September (monsoon season) (Brunda G*et al.*(2007). [15]

Wasps, honeybees, scorpions, centipedes were responsible for the majority of stings. A total of 7 cases were reported. Most of the victims were male 4 (75%) and a few female 3 (66.7%). Bite marks were seen in all the cases. And no causality had been reported.Senanayake AM *et al.*(2018)[19] studied the clinico-epidemiology of arthropod stings and bites in primary hospitals of North Western province of Sri Lanka. Results showed that 56% were males. Most of stings and bites (75%) occurred in the daytime (Srivastava A*et al.*(2005) [20]

A total of 10 plant poisoning cases were reported of which 9 cases (23%) were due to poisonous mushrooms and other one is due to a cardiotoxic plant called nerium 1 (2%).Most of the victims are females 6 (4.5%). Sriapha C*et al.*(2015)[21]did a 10-year retrospective analysis of poisoning in Thailand and found that plant poisoning was the fifth most common type of poisoning recorded especially Cerebra thevetia. Srivastava A*et al*. (2005) [20]found that poisoning due to plants was low (1.7 %), but datura was the most commonly ingested.Srihari C *et al.* (2017)[22]did a study in a tertiary care teaching hospital in South Indiaand observed that 3.47% patients presented with oleander seed poisoning

Poisoning due to volatile substances (37 cases) were also observed in this study. Majority of the poisoning was due to kerosene 24 (64%) remaining of them included ammonia, petrol and diesel, (Tab. 4). Most of the victims were female 22 (59%). A 10 years study done by Nhachi CFB*et al.*(1994)[23]showed that Kerosene was the most common poisoning agent accounting for 68% of the total poison Admissions in Zimbabwe's Main Urban Centres. Thomas M, *et al.*(2000)[24]found thatKerosene was the commonest poison in children and petroleum derivatives are one of the leading cause of poisoning in Brazil (Presgrave RF, *et al*. 2008).[25]

Poisoning due to house old chemicals containing causatives/bleaching agents showed an increasing trend from 2012 to 2017. A total of 26 cases related corrosive acids were reported. Out of it most common poison was floor cleaner 19 (73%). Most of victims were female 17 (65%). Klepac T *et al*. (2000)[26] analysedpoisoning incidents in Iran. 11% of poisoning incidents were caused by corrosives, 4% by hypochlorite.The leading cause of poisoning in Brazil, among consumer products was household cleaning products andbleaching agents(Presgrave RF, *et al.*(2008)[25]. A study done by NhachiCFB *et al.*(1994)[23] in Zimbabwerevealed that bleaches (5.1 %) and caustic soda (3.3%) were responsible for poison emergency. Other studies from populations in London and IndiareportsHousehold cleaners, phenyl corrosives,to be the commonest poison consumed followed by organophosphorus compounds (GouldingR*et al.*(1978) [27]; Srivastava A *et al.* (2005). [25]

Conclusion

The present data gives insight to the epidemiology of poisoning in our hospital. The commonest agents involved in the poisoning were due to agricultural poisons followed by therapeutic drugs, of these majority of cases, involved anti-inflammatory, analgesic, anti-histamines followed by Sedatives/ hypnotics; accounted for almost half. .Among the agricultural poisons/pesticides, maximum poisoning was due to organophosphates followed by zinc phosphide.

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Conflict of Interest: None to declare

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