

Profile and pattern of poisoning cases reported in a tertiary care teaching hospital in Kerala

Vivek Gopinathan^{1,*}, K. Padmakumar²

¹Assistant Professor, Dept. of Emergency Medicine, ²Professor, Dept. of Forensic Medicine, Jubilee Mission Medical College & Research Institute, Thrissur

***Corresponding Author:**

Email: vivgopi@yahoo.com

Abstract

Introduction: Poisoning is a major socio economic problem worldwide. Morbidity and mortality resulting from poisoning varies from region to region within our country. Till date a definite data relating to profile and pattern of poisoning cases in this part of country is not available.

Materials and Method: The profile and pattern of poisoning cases admitted in Jubilee Mission Medical College & Research Institute, Thrissur over a period of one year was studied retrospectively based on medical records.

Results: Among the 182 cases studied majority were females. The most commonly affected age group was 21-30 years. Married outnumbered the unmarried. The incidence of poisoning was higher during the month of May. Incidences of suicidal cases were highest in the present study followed by accidental poisoning. Few cases were of undetermined origin. Mode of administration of poison in all the cases is oral. The study observed increasing trend of poisoning by Pharmaceutical products followed by insecticides.

Conclusion: Analyzing the trends in poisoning in a particular zone periodically will help the health policy-makers to plan management policies and prevention strategies.

Keywords: Poisoning, Pesticides, Drugs, Suicide.

Introduction

In recent years the incidence of poisoning has increased and this has been considered as a highly disabling condition.⁽¹⁾ Based on a report published by World Health Organisation in 2012, it was stated that nearly ten lakhs deaths occur on an average due to suicidal poisoning alone. In addition to this 1, 93,460 deaths from accidental poisoning are reported.

In South-East Asian countries, poisoning have been responsible for 1840 disability adjusted life year loses.⁽²⁾ It has been estimated that annual incidence of acute poisoning in India ranks among the top countries in the world.⁽³⁾ However there is no national data or surveys which substantiate the exact incidence of poisoning and the true number could be much higher.

Most of the cases of poisoning are due to intentional self-administration. Poisoning associated morbidity and mortality vary from region to region and changes over a period, due to introduction and use of new brand of illegal drugs and toxic chemicals.^(4,5,6) Pattern of poisoning in any region depends on variety of factors such as availability of poisons, socio economic status of population, religious beliefs and cultural influences.⁽⁷⁾ Homicidal and accidental poisoning is also not uncommon. Mortality and morbidity due to poisoning and drug abuse has medical, legal and social significance.

The aim of present study is to know the magnitude, pattern and profile of poisoning at a tertiary care hospital and this study can be helpful in formulating recommendations for prevention and reduction of poisoning related morbidities and mortality.

Materials and Method

The present study was conducted over a period of one year at a tertiary care teaching hospital in mid Kerala. Prior to the start of the study, clearance was obtained from the college ethical and research committee board. The study population consisted of 182 cases that were admitted, and data obtained from retrospectively examining medical case sheets. The permission to review the case records were obtained from the medical records department. Case sheets with inadequate data were skipped. Poisoning was diagnosed by history given by patient and relatives, clinical features, investigations and response to treatment. The socio demographic characteristics like age, sex, marital status, manner of poisoning and chronological factors like time of consumption and seasonal incidence were also studied. All the observations were recorded in specially designed proforma; Data was then collected and analyzed.

Inclusion Criteria: All cases of acute chemical, vegetable, pharmaceutical and food poisoning cases irrespective of age and sex.

Exclusion criteria: Cases with animal envenomation and drug reactions.

Results

The following were the results in 182 poisoning cases studied.

Gender: Females 108 cases (59.34%) were more affected than males as shown in Fig. 1.

Age group: most commonly affected was 21-30 years (40%) followed by 11-20 years (19%). Distribution of poisoning cases in relation to age is shown in Fig. 2.

Marital status: shows that married 103 cases (56.59%) outnumbered unmarried 79 cases (43.41%).

Socio-economic status: More than two thirds belonged to low socio-economic group.

Monthly pattern: shows the incidence of poisoning was higher during the months of May, and January. Month wise distribution of cases is shown in Fig. 3.

Diurnal pattern: time of consumption in majority of cases-46 (39%) was observed during day. Incidence of night time poisoning were 40 cases (34%) and in 33 cases (27%) exact time was not known.

Manner of poisoning: shows that Incidences of suicidal cases (74.73%) were highest in the present study followed by accidental (14.83%) poisoning. 19 cases (73.56%) were of undetermined origin. This inference is based on history. This is shown in Table 1.

Mode of administration: of poison in all cases is oral.

Type of poisons: included Pharmaceutical products (36.81%), Insecticides (145.39%), and rodenticides (12.09%). Distribution of poisoning cases according to type of poison is shown in Table 2. Among the pharmaceutical products maximum cases of ingestion is with sedatives and hypnotics followed by Non-steroidal anti-inflammatory drugs. Distribution of cases according to the type of pharmaceutical product is given in Table 3. Among insecticides organophosphorus compound was the commonest.

Outcome: Outcome was good in almost all patients. Death occurred only in two cases, both of which were organophosphorus poisoning. Fatality in both cases were due to massive pulmonary oedema.

Table 1: Manner of Poisoning

| Manner | N (%) |
|------------|--------------|
| Suicidal | 136 (74.73%) |
| Accidental | 27(14.83%) |
| Unknown | 19(10.44%) |

Table 2: Toxic agents consumed by patients

| Poison type | N (%) |
|--------------------------------|------------|
| Drugs | 67(36.81%) |
| Insecticides | 28(15.39%) |
| Rodenticides | 22(12.09%) |
| Plants | 17(9.34%) |
| House hold agents & detergents | 15(8.24%) |
| Corrosive acids& Alkalis | 12(6.58%) |
| Kerosene | 7(3.85%) |
| Herbicide | 4(2.20%) |
| Metallic | 2(1.10%) |
| Pyrethrins | 8(4.40%) |

Table 3: Drugs ingested by patients

| Drug type | N (%) |
|---------------------------------|-------------|
| Sedatives & Hypnotics | 20 (20.85%) |
| NSAIDs | 12 (17.91%) |
| Antipsychotics& Antidepressants | 9 (13.43%) |
| Antihypertensives | 4 (5.97%) |
| Bronchodilators | 2 (2.99%) |
| Hypoglycemic agents | 4 (5.97%) |
| Thyroxine | 4 (5.97%) |
| Antihistamines | 2 (2.99%) |
| Polypharmacy | 10 (14.92%) |

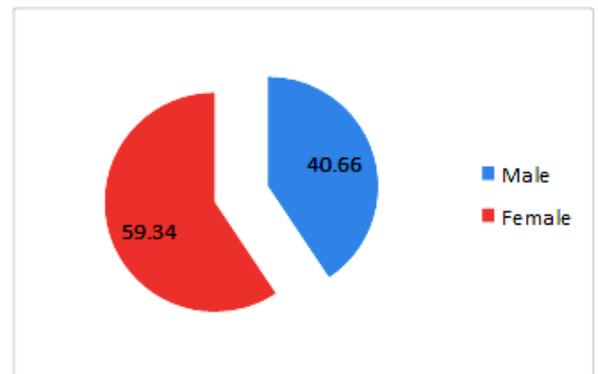


Fig. 1: Distribution of poisoned patients based on gender

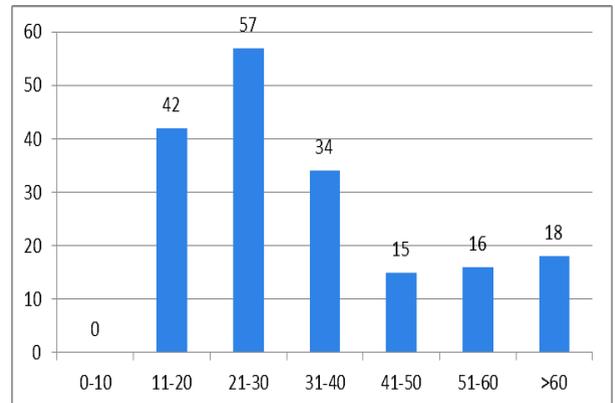


Fig. 2: Distribution of cases based on age groups

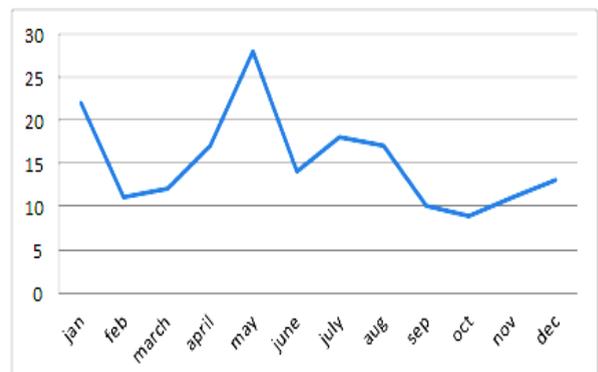


Fig. 3: Month wise distribution of poisoning cases

Discussion

A profile of poisoning cases admitted to a Medical College hospital in mid Kerala during a period of one year was evaluated retrospectively in this study. In the present study Women outnumbered men, a finding similar to the study conducted in the same institution during 2012-2013⁽⁸⁾ and another study conducted in Coimbatore during 2010 to 2012⁽⁹⁾. But most of the studies in India^(10,11,12) and in Bangladesh⁽¹³⁾ showed a male predominance. We postulate that this gender predominance could be due to the higher female: male sex ratio seen in Kerala.

The incidence of poisoning was seen highest in the age group of 21 to 30 years followed by 11 to 20 years. Similar finding was consistently observed in most of the Indian studies.^(6,8,9,10,14) Mental stress is more prone to the age group of 21 to 30 years. The Reasons being stress due to education, unemployment, beginning of employment, settlement in life etc.

Another finding was, married cases outnumbered unmarried ones. Marital disharmony and economic pressure after marriage are the major causes of suicide among the married people in developing countries.^(8,9,11,15) Whether this is also linked to the increased number of divorce cases after marriage needs to be looked into.

The incidence of poisoning was higher during the months of May followed by January. Few studies in India showed more incidences during summer⁽¹²⁾ and there are studies which showed maximum cases during rainy season.⁽¹⁶⁾ There are studies which show that there is a relationship between summer suicide rates and biochemical, metabolic, and immune variables.⁽¹⁷⁾

Higher number of poisoning due to pharmaceutical products is the new finding in this study. Similar finding was obtained in a study conducted in the same institution during 2012-13⁽⁸⁾ and in studies conducted in western countries.^(4,7,18) This was in contrast to previous Indian studies where agrochemicals most common.^(6,10,11,12) In the drugs consumed majority were sedatives and hypnotics followed by Non-steroidal anti-inflammatory drugs. Availability of different kinds of drugs at home and over the counter sale of drugs is related to increase in intentional drug intake. Also it shows a shift in profession were previously most were farmers and had access to pesticides which has moved down to the second commonest type of poisoning. Another observation of present study is consumption of house hold substances like detergents, kerosene etc. and pyrethrins are on the rise.

Strengths and Limitations of the study

This study throws light on profile of poison cases on which many studies are not present. A one year single hospital study might not reflect the accurate profile of poisoning in a region. Hence a multicenter study for a longer duration is suggested. Laboratory

analysis to confirm the type of poison was not done in doubtful cases.

Conclusions and recommendations

Females are affected more than males with highest number of incidence of poisoning in the age group of 21 to 30 years. Most common type of poison consumed was drugs. Among the drugs majority were sedatives and hypnotics. Highest incidences of poisoning occurred during May followed by January. Wide use of pesticides in agriculture makes its easy availability and its unrestricted sale is a threat.

As mentioned previously no solid national data with regards to poisoning is present. So we suggest the setting up a National Poison Registry which can provide the same. Mortality and morbidity due to poisoning can be reduced by safety measures for storage and use of pharmaceutical products and strict vigilance of sale of insecticides. Highly equipped treatment facilities and establishment of poisoning centers have become the necessity of the hour. Extending psychiatric services to the community may help in identifying high risk population who are likely to commit deliberate self-harm.

References

1. Asadi R, Afshari R. Applying Global Burden of Diseases in Medical Toxicology. *Asia Pac J Med Toxicol* 2014;3:1.
2. Mathers C, Boerma T, Fat DM. World Health Organization (WHO), *The global Burden of disease. 2004 update*. Geneva, Switzerland. WHO Press, 2008.
3. Pillai VV. *Modern Medical Toxicology*. 4th ed. New Delhi: Jaypee Brothers Medical Publishers: 2013.
4. Hovda KE, Bjornaas MA, Skog K, Opdahl A, Drottning P, Ekeberg O, et al. Acute poisoning treated in hospitals in Oslo: A one year prospective study (I) Pattern of poisoning. *Clin Toxicol (Phil)* 2008; 46: 35-41.
5. Afshari R. Non-Medical use of Medications in Middle and Low income countries. *Asia Pac J Med Toxicol* 2014; 3:49.
6. Singh B, Unnikrishnan B. A profile of acute poisoning at Mangalore (South India), *J Clin Forensic Med* 2006; 13: 112-16.
7. Krishan Vij. *Forensic Medicine and Toxicology, Principles and practice*. 5th ed. New Delhi: Elsevier: 2011.
8. Padmakumar K, Revi N G. One year study on pattern of Acute Pharmaceutical and chemical poisoning cases admitted to a tertiary care hospital in Thrissur, India. *Asia Pac J Med Toxicol* 2015; 4:79-82.
9. Padmakumar K, B G Mahesh Krishna, J Jaghadheeswararaj, A Natarajan. Incidence of Poisoning Reported at a Tertiary care Hospital, *J-SIMLA* 2013; 5(2):58-62.
10. Patil A, Peddawad R, Verma VCS, Gandhi H. Profile of Acute Poisoning cases Treated in a Tertiary Care Hospital: A Study in Navi Mumbai. *Asia Pac J Toxicol* 2014; 3: 36-40.
11. Prajapati T, Prajapati K, Tandon R, Merchant S. Acute Chemical and Pharmaceutical Poisoning Cases Treated in Civil Hospital, Ahmedabad: One Year study. *Asia Pac J Toxicol* 2013; 2:63-67.
12. Bharath K Guntheti, Singh U P. The Pattern of Poisoning in Khammam. *J Indian Acad Forensic Med* 2011; 33:296-300.

13. Bari MS, Chakraborty SR, Alam MMJ, Qayyum JA, Hassan N, Chowdhury FR. Four-Year study on acute poisoning cases admitted to a tertiary Hospital in Bangladesh: Emerging trend of poisoning in Commuters. *Asia Pac J Toxicol* 2014;3: 152-56.
14. Tejas P, Kartik P, R N tendon, Saamil M A. Study of Acute Poisoning cases excluding animal bites at Civil hospital ahmadbad. *J Indian Acad Forensic Med.* 2013; 35(2) 120-22.
15. Ramesha KN, Rao KB, Kumar GS. Pattern and Outcome of acute poisoning cases in a tertiary care hospital in Karnataka, India. *Indian J Crit Med* 2009; 13:152-5.
16. Srinivasulu, MK Mohanty. Study of Poisoning cases in a tertiary care hospital. *J SIMLA* 2011; 3(1): 14-18.
17. Maes M, Soharpe S, Dhondt P etal. Biochemical, metabolic and immune correlates of seasonal variation in violent suicide: A Chronoepidemiologic study. *European psychiatry*; 1996(11): 21-33.
18. Afshari R, Majdzadeh R, Balali-Mood M. Pattern of Acute poisonings in Mashhad, Iran 1993-2000. *J Toxicol Clin Toxicol* 2004;42: 965-75.