Original Article

A Retrospective Study of Clinical Profile of Acute Poisoning in a Tertiary Care Teaching Hospital in Kerala, India, during 2014–2016

Vibha C Santosh[1], Omana Menon[2]

[1]Associate Professor, Department of Medicine, Government Medical College, Ernakulam, Kochi, Kerala, India, [2]Assistant Professor, Department of Medicine, Government Medical College, Ernakulam, Kochi, Kerala, India

Abstract

Introduction: Most cases of poisonings reported in India were insecticides because in agricultural society they are the readily available source. Whether urbanization, literacy, and access to health care in Kerala have brought about any change in the pattern of poisoning such as mode of poisoning and type of poisoning, clinical profile of patients and outcome of treatment need to be analyzed.

Purpose: Cases admitted with poisoning pose an immense diagnostic and therapeutic challenge to treating physicians. An insight into the epidemiology of poisoning and detection of the current trends will not only help in preparedness in handling such cases but also for planning to deal with the changing trends and preventive strategies.

Materials and Methods: This was a retrospective study. Case records of all cases of poisoning from 2014 to 2016 were procured from the medical records section after obtaining clearance from Institutional Review Board and Ethics Committee. The data were entered into Microsoft Excel and analyzed.

Results: Pesticides continue to be the most common agent (52%), and cause of mortality in poisoning closely followed by drugs and other chemical agents (41.4%), and unknown substances (6.5%) drugs alone showed an increasing percentage of abusers, 28.5% for the year 2016. Males were more than females attempting deliberate self-harm. Alcohol consumption was reported in 61% of male cases. Most common age group was between 20 and 30 years. Psychiatric evaluation of survivors showed a large number of cases having psychiatric disorders such as affective disorders, personality disorders, and neurotic syndromes. Marital and social issues and financial problems were the stressors identified.

Conclusion: Although pesticide was the most common agent used, there is an increase in the number of cases abusing drugs and other chemicals. Most commonly used drugs such as paracetamol and other analgesics available over the counter were the drugs being commonly misused. Alcoholism and psychiatric illnesses, present in a large number of survivors needs to be identified early and treated for decreasing the attempts at deliberate self-harm by poisoning.

Key words: Acute poisoning, Clinical profile, Pesticides and drugs, Psychiatric evaluation, Tertiary care hospital

BACKGROUND

Most cases of poisonings used to be with insecticides because in agricultural society they are the most readily available agents. Whether urbanization, increased literacy, and health facilities in Kerala have brought any change in the pattern of poisoning such as mode of poisoning and type of poisoning, clinical profile of patients and outcome of treatment need to be analyzed, for future preparedness and prevention strategies.

INTRODUCTION

Acute poisoning is a cause for significant mortality and morbidity all over the world. Poisoning is the 4th most common cause of mortality in India.[1] The number of

Corresponding Author: Dr. Vibha C Santosh, 37/3060-A (PRSRA - 44), Azhakanthara Stadium Cross Road, Ponoth Rd., Kaloor, Kochi - 682 017, Kerala, India. Phone: +91-9447407929. E-mail: vibhacmc@gmail.com

suicides in India has increased by 22.7% in the decade 2002–2012 according to National Crime Records Bureau. Attempted suicide is of interest because it has been found to be a predictor of future suicides.[2] Interventions aimed at suicide attempters will, therefore, be a logical strategy for the prevention of deaths due to deliberate self-harm.[3] Profile of patients and their choice of agents depend on the availability of substances locally, and the socioeconomic and cultural backgrounds. It is seen to vary in different regions.[4-6] Motives and modes are different in India from other countries.

Clinical course and outcome depend on the agent used, amount consumed, the time taken for hospitalization and treatment[7] in India 5–6 persons/Lakh population die due to poisoning yearly.

Pesticides were found to be the most common agent used in the developing world poisoning with medicines such as benzodiazepines and antipsychotics being common in urban areas.[4] Developing world countries such as Bahrain, Chile Kuwait Malaysia, and Singapore have reported paracetamol as a common agent.[4]

Kollam in South Kerala has the highest suicide rate for a city in Kerala and also has the 6th highest suicide rate among all cities in India.[8] This retrospective analysis of poisoning cases admitted to a government tertiary care center in a municipality in central Kerala, with 2nd highest literacy rate in the country, was, therefore, done to analyze the profile and outcome of poisoning cases admitted between 2014 and 2016.

MATERIALS AND METHODS

Records of the poisoning cases admitted in this institute from January 2014 to December 2016 were collected from the medical records section and details regarding age, sex, time after intake, circumstances, type of poison, mode of intake, clinical evaluation at admission, duration of hospitalization, and outcome were collected and analyzed.

RESULTS

There were 240 cases of poisoning admitted to hospital during the study period of 3 years, with 66, 84, and 90 cases in 2014, 2015, and 2016, respectively. Of 240 cases, 128 (53.3%) were males and 112 (46.6%) were females [Figure 1]. The maximum cases were in the age group 21–30 years (32.5%) followed by 31–40 years (21.6%) [Figure 2]. The most common poison was pesticides (52%) followed by drugs and chemicals (41.4%), and substance was not known in 6.5% cases [Figure 3]. History of
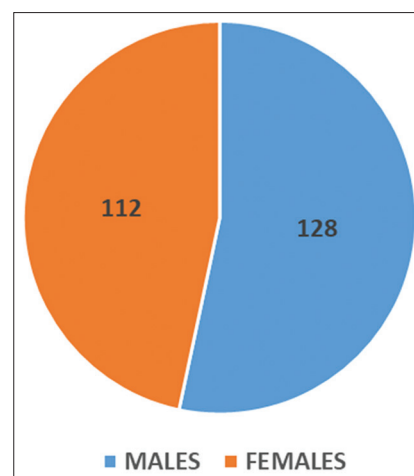

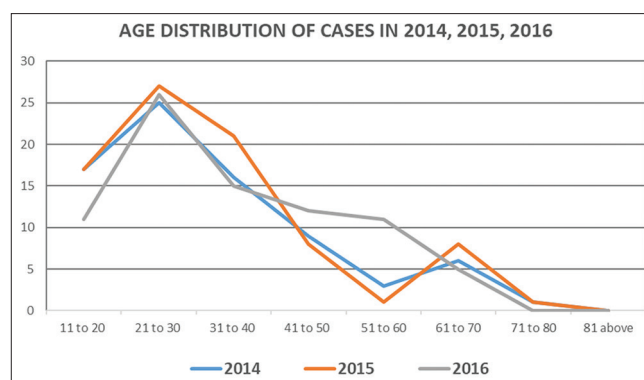**Figure 1: Gender distribution of total cases**
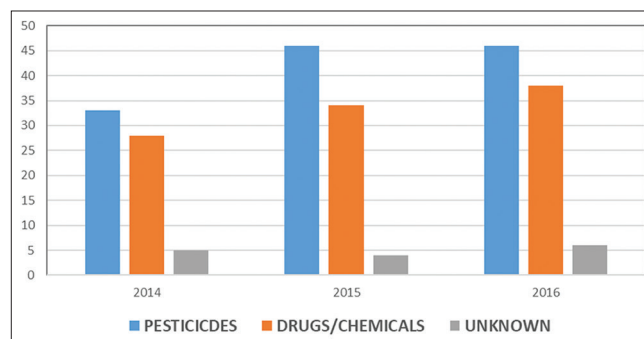

Figure 2: Age distribution

Figure 3: Substance consumed

psychiatric illness in the past was present in 54 (23%) cases while that of previous suicidal attempts was present in 24 (10%) cases [Figure 4].

Majority of cases (80%) had hospitalization for <1 week. 77% of cases recovered. 18% of cases left against medical advice. 2.9% cases were referred and 8.7% expired [Figure 5].

Psychiatric evaluation of survivors showed that 24% of cases had affective disorder, 15% had behavioral syndromes, 24% had personality disorders, and 7% had
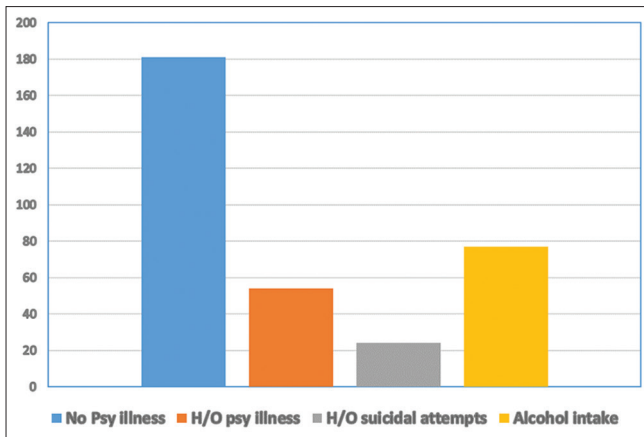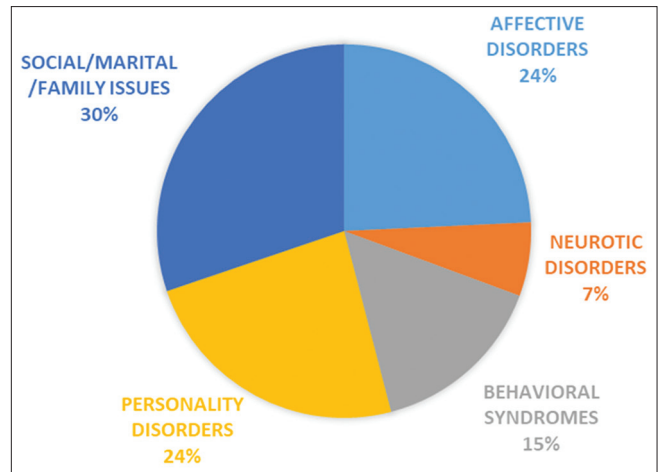
Figure 4: Past history
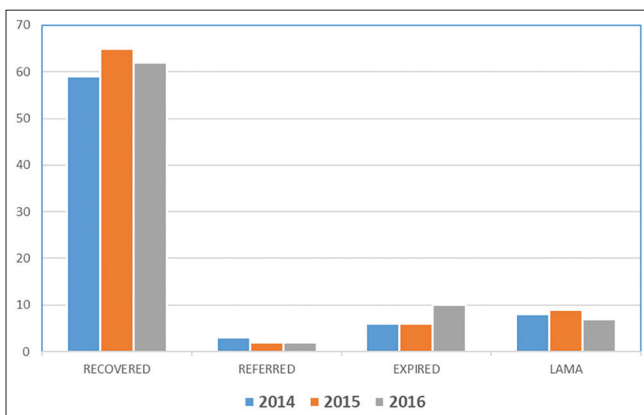

Figure 6: Psychiatric evaluation of survivors
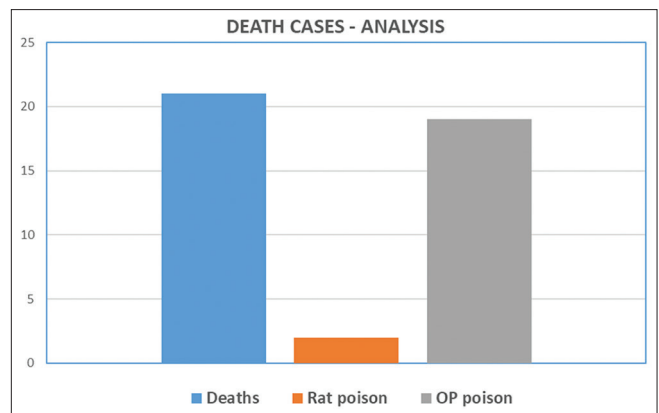

Figure 5: Outcome of cases

Figure 7: Outcome analysis

neurotic disorders and there were multiple social marital and other family issues in 30% of cases [Figure 6]. There were total 21 deaths (8.7% mortality rate) all in pesticide group [Figure 7].

DISCUSSION

Self-poisoning is the most common method to commit suicide (33%) followed by hanging (26%) and self-immolation (9%) in India, in 2012, according to statistics of government.[9]

The most common agent used for self-poisoning in India was pesticides.[4,10,21,11-19,27] In our study through the most common agent was pesticides (52%), there was a high percentage of poisoning with drugs and chemicals (41.4%). The substance consumed was unknown in 6.5% cases.

Drugs showed an increase from 17.1% in 2014, 18.5% in 2015, to 28.5% in 2016. The substance used was unknown in 6.5% of cases over the 3-year period. This is similar to other studies from urban India reported by National Poison Information Bureau at AIIMS New Delhi.[20] They

found that drugs constituted 18.8% and chemicals 8.9% samples received.

Most common pesticide in our study was organophosphorus compounds, rodenticide being next common. Similar findings have been reported from Tamil Nadu with organophosphorus constituting 58.6% followed by rat poison the second most common agent[17] we had no case of aluminum phosphide poisoning which is similar to the findings from a study in Kerala.[11]

Drug overdose constituted a significant number in more recent studies (2017) even when pesticides were most common cause.[19,27] In a study from the UK, in 2001, there was a substantial increase in self-poisoning with paracetamol and that with non-opiate analgesics, which rose from 48%, in 1985, to 60.6%, in 1997.[5] In our study, the most common drugs abused were paracetamol and analgesics constituting 26.4% of total cases of drug overdose. Other drugs abused were sedatives, antipsychotics, antiepileptic, antihistamines bronchodilators, and thyroxine. Eddleston in a 2000 study had reported that self-poisoning with drugs was being increasingly reported from urban areas.[4] A study

from a corporate hospital in New Delhi had reported benzodiazepines as a most common agent.[7]

Most of the cases in our study belonged to the age group of 21–30 years in all 3 years of study 2014–2016. This is similar to other studies.[7,10,12-15,1,17,18,21,27]

The youngest patient was 14 years and oldest 80 years. In our study, there were 53.4% males and 45.8% females, which has been reported in other studies.[1,10,12-14,20,21] A study from Kerala, in 2009, also reported more males.[16] This is interesting as Kerala has a sex ratio favoring women (WWW, Census 2011. co.in) unlike other states in India.

The route of poisoning was oral in all cases during the study period similar to other studies.[7,17,21,22]

In our study, 22.5% of cases had a history of past psychiatric illness, while 10% had a suicidal attempt in the past. In a 2016 study from a tertiary care center, psychiatric illness was as high as 81%.[23] Physical and mental illness, societal structure, and specific stressors such as financial problems and interpersonal relationships have been shown to play a major role.[24]

Attempted suicide is a significant predictor of suicide and, therefore, is a focus area for further research.[5] >5% people admitted in hospital following an incident of deliberate self-harm have committed suicide within a year,[6] therefore, the need for psychiatric evaluation and treatment in attempted cases.

Alcohol abuse was present in 61% of male cases, while only 4 female cases reported alcohol abuse. This was higher than that reported in a study from Karnataka.[13]

Psychiatric evaluation was done in 164 patients (68.3%). Among this Affective disorder was present in 34.7% of cases, personality disorder was seen 34.1% of cases, behavioral syndrome reported in 21.9% of cases, and neurotic syndromes in 9.1% of cases. Marital discord, social and family issues were the immediate stressors found in 43.29% cases. In a study, where psychiatric evaluation was done in 60% of cases, reactive depression was found in 35%. Another study done over a 10 year period reported, in 2016, there was increase in depression cases to 67%.[23] Other studies have also reported depression, personality disorders, alcohol abuse, low income, and marital discord as stressors.[18,25]

Mortality was 8.7% in our study with a total of 21 deaths of whom 19 were due to organophosphorus and 2 due to rodenticide. The death reported in another study, in 2000, was 3.3%.[26] A study from Kerala, in 2011, reported

mortality of 1.5%.[25] Another study from Karnataka, in 2005, reported deaths in 15.7% cases.[1] Most of the cases admitted to our hospital were referred from smaller peripheral hospitals. The time taken for hospitalization plays a key role in mortality, as also whether patient vomited soon after taking the poisonous substance. In our study, 90% of those who expired had either not vomited or vomited after >½ after ingestion. Of the 21 deaths, 19 were due to organophosphorus compounds and 3 were due to rodenticide. Significantly, there were no deaths in the drugs and chemicals group.

Of the total cases, 83.3% had a hospital stay of <1 week while 18.75% stayed >1 week. This might be reflective lesser severity and lethality of substance consumed, and therefore suggest low intentionality. In another study from Kerala[25] almost 82% were discharged in <6 days. It was noted that aggressive treatment, early hospitalization can influence outcome positively.

Attempted suicide has been found to be a predictor of suicide. Interventions targeting suicide attempters will, therefore, be helpful in reducing suicide rates. Kerala has one of the highest suicide rates. Studies have shown that regulating the supply of pesticides has not been of help in reducing suicide rates[3] Study of the profile of suicide attempters will be helpful in devising local strategies. High suicide rates have been identified in persons with psychiatric illness and alcoholism. Identifying and treating psychiatric diseases and spreading awareness on the ill effects of alcoholism and drug abuse in early teens can prove helpful.

The lower mortality rates from studies from Kerala show that timely hospitalization, aggressive management, and preparedness in hospitals can result in better outcomes.

Drawbacks
Being a retrospective study, there was no information available regarding other comorbidities or risk factors in the study population. There being no follow-up records, the long-term outcome was not assessed.

CONCLUSION

Pesticide continues to be the most common agent in the study period, but there is an increase in the abuse of drugs and other chemicals, indicating a changing pattern. Mortality in acute poisoning is due to pesticides. A large number of survivors had psychiatric disorders. Early diagnosis and treatment of psychiatric disorders are a target area for potential intervention to reduce the cases of deliberate self-harm.

REFERENCES

1. Unnikrishnan B, Singh B, Rajeev A. Trends of acute poisoning in South Karnataka. Kathmandu Univ Med J (KUMJ) 2005;3:149-54.
2. Hawton K, Fagg J. Suicide, and other causes of death, following attempted suicide. Br J Psychiatry 1988;152:359-66.
3. Nandi DN, Banerjee G, Boral GC, Chaudhary A, Bose J. Is suicide preventable by restricting the availability of lethal agents? A rural survey of West Bengal. Indian J Psychiatry 1979;21:251-5.
4. Eddleston M. Patterns and problems of deliberate self-poisoning in the developing world. QJM 2000;93:715-31.
5. Townsend E, Hawton K, Harriss L, Bale E, Bond A. Substances used in deliberate self-poisoning 1985-1997: Trends and associations with age, gender, repetition and suicide intent. Soc Psychiatry Psychiatr Epidemiol 2001;36:228-34.
6. Skegg K. Self-harm. Lancet 2005;366:1471-83.
7. Singh O, Javeri Y, Juneja D, Gupta M, Singh G, Dang R. Profile and outcome of patients with acute toxicity admitted in intensive care unit; Experiences from a major corporate hospital in urban India. Indian J Anaesth 2011;55:370-4.
8. Catalogs/State/UT Wise Distribution of Suicide by Causes. Available from: https://www.data.gov.in/resources/all-india-level-causes-wise-distribution-%20suicides-during-2015.
9. Accidental Deaths and Suicides in India 2007. New Delhi: Ministry of Home Affairs GOI, NCRB; 2009.
10. Gargi J, Rai H, Chanana A, Rai G, Sharma G, Bagga IJ. Current trend of poisoning-a hospital profile. J Punjab Acad Forensic Med Toxicol 2003;3:41-5.
11. Pillay VV, Arathy SL, Vijesh KP, Vipin KG. Five year survey of toxicological testing of clinical body fluid samples at poison control centre in the Indian state of Kerala. J Indian Acad Forensic Med 2010;32:52-5.
12. Das SK, Raju AS, Mohanty MK, Patnaik KK, Mohanty S. Sociodemographic profile of poisoning cases. J Indian Acad Forensic Med 2005;27:133-8.
13. Ramesha KN, Rao KB, Kumar GS. Pattern and outcome of acute poisoning cases in a tertiary care hospital in Karnataka, India. Indian J Crit Care Med 2009;13:152-5.
14. Sande SD, Kumar PU. Pattern of acute poisoning presenting at a tertiary care hospital. IOSR J Pharm 2017;7:39-42.
15. Kumar SV, Venkateswarlu B, Sasikala M, Kumar GV. A study on poisoning cases in a tertiary care hospital. J Nat Sci Biol Med 2010;1:35-9.
16. Job C. Retrospective study of poisoning cases in Thrissur district of Kerala for the year 1995. J Indian Soc Toxicol 2009;5:23-7.
17. Maharani B, Vijayakumari N. Profile of poisoning cases in a tertiary care hospital Tamil Nadu India-2009-2012. J Appl Pharm Sci 2013;3:91-4.
18. Kirubairaj M, Jagaraj A, Mitra S, Kumar S, Selva B, Pushparaj M, *et al*. Profile of deliberate self-harm patients presenting to emergency department: A retrospective study. Indian J Fam Med Prim Care 2016;5:73-6.
19. Kumar KK, Sattar FA, Bondade S, Munnawar M, Hussain S, Priyadarshini M. A gender specific analyses of suicide methods in deliberate self-harm. Indian J Soc Psychiatry 2017;33:7-21.
20. Srivastava A, Peshin SS, Kaleekal T, Gupta SK. An epidemiological study of poisoning cases reported to the national poisons information centre, all India institute of medical sciences, New Delhi. Hum Exp Toxicol 2005;24:279-85.
21. Khosya S, Meena SR. Current trends of poisoning: An experience at a tertiary care hospital in Hadoti Region, Rajasthan, India. J Clin Toxicol 2016;6:2.
22. Gupta B, et al. Organophosphorus Poisoning Facts and Myths. Medicine Update; 1999. p. 1345-8.
23. Singh P, Shah R, Midha P, Soni A, Bagotia S, Gaur K. Revisiting profile of deliberate self-harm at a tertiary care hospital after an interval of 10 years. Indian J Psychiatry 2011;58:301-6.
24. Vijayakumar L. Indian research on suicide. Indian J Psychiatry 2010;52:S291-6.
25. Soman CR, Shahulhameed S, Ramankutty V, Vijayakumar K, Kunjukrishnapillai R, Ajayan K, *et al*. Cohort profile: The Prolife study in Kerala, India. Int J Epidemiol 2011;40:10-4.
26. Thomas M, Anandan S, Kuruvilla PJ, Singh PR, David S. Profile of hospital admissions following acute poisoning-experiences from a major teaching hospital in South India. Adverse Drug React Toxicol Rev 2000;19:313-7.
27. Reddy TM, Fayaz S, Prasad TS, Siva S. Pattern of acute poisoning, therapeutic approach and outcomes in South India tertiary care teaching hospital, Andra Pradesh. Int J Univ Pharm Biosci 2015;4:67-78.