DOI: 10.14260/jemds/2014/3692

ORIGINAL ARTICLE

PROFILE OF POISONING CASES IN A TERTIARY CARE HOSPITAL, TAMILNADU

T. Karikalan[1], M. Murugan[2]

HOW TO CITE THIS ARTICLE:
T. Karikalan, M. Murugan. "Profile of Poisoning Cases in a Tertiary Care Hospital, Tamilnadu". Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 56, October 27; Page: 12754-12760,
DOI: 10.14260/jemds/2014/3692

ABSTRACT: BACKGROUND AND OBJECTIVES: Poisoning is an important public health problem causing significant morbidity and mortality throughout the world. Knowledge of general pattern of poisoning in a particular region will help in early diagnosis and treatment of cases, thus decreasing the rate of mortality and morbidity. Information available in our locality with regard to acute poisoning is limited. The present study was carried out with the objective to investigate the pattern of acute poisoning cases in a tertiary care hospital in Coimbatore, Tamilnadu. **MATERIALS AND METHODS:** A retrospective analysis of all acute poisoning cases admitted to the emergency department of Karpagam Faculty of Medical Sciences and Research from April 2003 to March 2004 was done to study the pattern of poisoning. Data regarding age, sex, marital status, occupation, religion, locality, route of exposure, time elapsed after intake, circumstances of poisoning, name of poisonous substance, chemical type, duration of hospitalization and outcome were collected and analyzed. **RESULTS:** All reported cases were found to be suicidal poisoning. Majority of cases were in the age group of 11 – 20 years. Females (112 cases, 70%) outnumbered males (48 cases, 30%). Students attempted to commit suicide much commoner than others followed by house wives and daily wage laborers. The commonest poison consumed was cow dung powder. The mortality rate was higher among those consumed rat killer poison (37.5%). **CONCLUSION:** This study adds information to the existing data which may help to develop prevention strategies. Health education to adolescents at school and college level about poisoning, regular counseling program for all high school children either by an in house trained faculty or a child psychologist and early detection of risk taking behavior in adolescents may to some extent prevent deliberate self-harm in teenagers. Ban on cow dung powder sales in grocery shops should be followed by district authorities with strict penalties for those involved in selling this dangerous chemical. This calls for urgent research to find strict legislative measures over the sale and purchase of cow dung powder poison.

KEYWORDS: Poisoning, Cowdung powder, Teenagers, Coimbatore.

INTRODUCTION: Poisonings and snake bites constitute a major cause of hospitalization and mortality in developed as well as developing nations. Among the various causes of poisonings, pesticides are the most common cause of self-poisoning worldwide with the proportion ranging from 4% in the European region to over 50% in the Western Pacific region.[1-4]

Approximately 258,000 fatal cases of pesticide self-poisoning are reported globally each year, most from Asia, and the figure is greatly exceeded by the number of poisoned patients who seek treatment at health facilities.[4] Data about the other kinds of poisonings are limited and are quite variable depending on the geographical area, socioeconomic factors and cultural diversity.[5–9] In a previous retrospective study from South India, organophosphorus compounds (OPC) were reported as the most common cause of poisoning (36.0%) followed by snake bite (16.2%), drugs (11.0%), rat

DOI: 10.14260/jemds/2014/3692

poison (7.3%) and others.[10] Another study from North India also reported OPC and celphos as the most common poisonings although a majority (76.60%) were unknown poisonings.[11]

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. Management of these critically ill patients will greatly improve if the common causes of poisoning are properly defined.[12] Knowledge of general pattern of poisoning in a particular region will help in early diagnosis and treatment of cases, thus decreasing the rate of mortality and morbidity.

Information available in our locality with regard to acute poisoning is limited. The present study was carried out with the objective to investigate the pattern of acute poisoning cases in a tertiary care hospital which includes the population demographics, distribution of cases depending on the nature of poison and the outcome of treatment.

MATERIALS AND METHODS: This is a retrospective hospital record-based study conducted in a tertiary care hospital. The study included all diagnosed cases of poisoning at all age groups reported during one year time period between April 2013 and March 2014. Cases of snake bite were also included in the study. The study was conducted with the approval from Institute Ethics Committee and confidentiality of data was ensured.

Data regarding age, sex, marital status, occupation, religion, locality, route of exposure, time elapsed after intake, circumstances of poisoning, name of poisonous substance, chemical type, duration of hospitalization and outcome were collected and documented in the structured proforma. The data collected was entered in computer database and analysis done by using proportion and chi-square test.

RESULTS: In the present study, 160 cases of poisoning were reviewed retrospectively. All reported cases were found to be suicidal poisoning. In all the cases, the route of exposure was oral. Females (112 cases, 70%) outnumbered males (48 cases, 30%). Majority of cases were in the age group of 11 – 20 years. Among 160 cases, 96 (60%) were unmarried (Table 1). Students attempted to commit suicide much commoner than others followed by house wives and daily wage laborers (Table 2). The commonest poison consumed was cow dung powder, followed by drugs, household products and organophosphorous compounds (Figure 1).

Most of the patients were hospitalized within six hours after toxic exposure (Table 3). Previous history of poisoning was seen in 4.5% of cases. Gastric lavage was done for all the cases. Specific antidotes were given in all cases, wherever it is indicated. All patients received adequate symptomatic and supportive measures. Lifesaving treatment in the form of mechanical ventilation and intubation were used for critical cases (16%). The mortality rate was higher among those consumed rat killer poison (37.5%) (Table 4)

DISCUSSION: The present study showed that the commonest poison consumed was cow dung powder (55%) followed by drugs (12.5%), household products (10%) and organophosphorous compounds (9.4%). However, pesticides particularly organophosphates and aluminium phosphide were the most common causes of poisoning in several studies done in India.[10,11]

Cow dung powder, a chemical substance, used in the dyeing industry, has emerged as the favorite substance for the Coimbatore city's depressed lot when they wish to take their lives.

DOI: 10.14260/jemds/2014/3692

Traditionally it was believed that the cow dung has germicide property. In modern era, due to unavailability of actual cow dung, people started using commercially available synthetic one. The synthetic cow dung powder called 'sani powder' in local parlance is used to clean courtyards, house and temple premises.

Cow dung powder is available in two different colours; yellow powder (Auramine O) and green powder (Malachite Green), commonly used in rural Tamilnadu (South India) in the districts of Coimbatore, Erode and Tirupur. Even though the sale is legally banned, the powder is easily available in grocery shops. It can cause gastrointestinal symptoms and persistent seizures sometimes.[13]

Cow dung powder was found to be the most common poison consumed in Coimbatore, by few studies done in the same locality.[13-15] It has been aptly said by various researches that the pattern of poisoning in a region depends upon various factors such as availability, cost and access to toxic agents, socioeconomic status, cultural and religious characteristics of people.[16-18]

It is interesting to note that this powder has been so widely used, that the district authorities banned the sale of this product in 2007. However it is still widely available and there is no trend of a decrease in the incidence of cow dung powder poisoning during the study period. This underscores the fact that banning such substances, without educating the public or tackling the fundamental cause of deliberate self-harm, will not succeed.

The second most common poison consumed was drugs (12.5 %) which included sodium valproate (antiepileptic), NSAIDS, benzodiazepines, oral hypoglycemic, anti-hypertensive, cough syrup and antibiotics, either alone or in combination, which was available at home. Household products were consumed by 10% of patients, which included hair dye, Lysol, bleaching powder and camphor. Only 9.4% consumed organophosphorous compounds, although they are the most common poisons consumed in our country.[10,11]

The present study showed that poisoning is more common in females compared to males in this locality. The male to female ratio was 1: 2.3. This pattern of female preponderance was observed only in few studies[19-21] and contradict the studies done in many parts of India.[17,22-25] The fact that poisoning in this locality is more common among girls students (teenagers) reflects their mental vulnerability to stress in the form of failure in exams, maladjustment and inability to cope up the high expectation from parents.

High degree of stress in academic, financial and social sectors as well as inability to achieve the targets on professional, educational and socioeconomic fronts leading to limited alternatives could be the contributory factors in taking suicidal actions. The house wives (25%) were the next vulnerable group as they are easily exposed to the poisoning agents, particularly cow dung powder. Factors like dowry, cruelty by in-laws, family quarrels, maladjustment in married life and dependence of women on husband are responsible for the higher incidence of poisoning among house wives.

Most of the patients in this study were in the young age group and maximum number of patients (50%) was in the age group of 11 – 20 years followed by 35% in 21 – 30 years age group. Since all the cases were suicidal in nature, the distribution pattern shows the mental vulnerability and impulsiveness of our youth. Violence, loss, abuse, mental illness and pressure from cultural and social backgrounds could be the possible risk factors. Studies in the past revealed that poisoning was more common in the age group 20 -30 years.[17,18,22-25] The change noted in this study can be attributed to the fact that people are subjected to substantial amount of mental stress much earlier in their life in terms of adapting to modern lifestyles, failure in love, family problems etc.

In our study, the overall mortality was found to be 3.75%. The mortality rate was higher among those consumed rat killer poison (37.5%), followed by yellow cow dung powder (3.75%). Mortality in the present study is probably lower because of less number of patients consuming fatal poisons like rat killers and pesticides. This finding is similar to recent studies showing higher mortality rate (59% - 65%) from Aluminium phosphide poisoning.[26,27] This highly toxic poison has already been banned in some countries but is easily accessible and affordable in India.

There is an urgent need for strict implementation of the Pesticide act, which regulated the import, manufacture, sale, transport, distribution and use of pesticides with a view to prevent risk to human beings. Data on acute poisoning in adults is scarce in our locality. We observed poisoning was common among age group 11- 30 years, which produces a huge socioeconomic burden on the society. This study adds information to the existing data which may help to develop prevention strategies. In the current competitive era, the pressure for academic excellence places a lot of stress on the adolescents that adds on to the risk taking or impulsive behavior.

Health education to adolescents at school and college level about poisoning, regular counseling program for all high school children either by an in house trained faculty or a child psychologist and early detection of risk taking behavior in adolescents may to some extent prevent deliberate self-harm in teenagers. Students should have a helpline cell, which students can contact for help. This will help identify who need special care and further evaluation. Ban on cow dung powder sales in grocery shops should be followed by district authorities with strict penalties for those involved in selling this dangerous chemical.

This calls for urgent research to find strict legislative measures over the sale and purchase of cow dung powder poison. Poison information Centre should be created in each district to benefit the common man in timely diagnosis and treatment. Strict implementation of anti-dowry law, marriage counseling and women empowerment will help in decreasing the day to day tension in married life and decrease the incidence of poisoning in house wives. Above all, public awareness about the seriousness of the problem through health education and efforts to develop a healthy outlook towards life can help in decreasing the incidence of suicidal attempts in the younger age group.

REFERENCES:

1. Bertolote JM, Fleischmann A, Butchart A, et al. Suicide, suicide attempts and pesticides: a major hidden public health problem. Bull World Health Organ 2006; 84: 260.
2. Khan NA, Rahman A, Sumon SM, et al. Pattern of poisoning in a tertiary level hospital. Mymensingh Med J 2013; 22: 241–247.
3. Mandour RA. Environmental risks of insecticides cholinesterase inhibitors. Toxicol Int 2013; 20: 30–34.
4. Gunnell D, Eddleston M, Phillips MR, et al. The global distribution of fatal pesticide self-poisoning: systematic review. BMC Public Health 2007; 7: 357.
5. Das RK. Epidemiology of insecticide poisoning at A.I.I.M.S Emergency Services and role of its detection by gas liquid chromatography in diagnosis. Med Leg Update 2007; 7: 49–60.
6. Unnikrishnan B, Singh B and Rajeev A. Trends of acute poisoning in south Karnataka. Kathmandu Univ Med J 2005; 3: 149–154.
7. Dash SK, Aluri SR, Mohanty MK, et al. Sociodemographic profile of poisoning cases. Journal of Indian Academy of Forensic Medicine 2005; 27: 133–138.

8. Srivastava A, Peshin SS, Kaleekal T, et al. 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: 279–285.
9. Thomas M, Anandan S, Kuruvilla PJ, et al. Profile of hospital admissions following acute poisoning – experiences from a major teaching hospital in south India. Adverse Drug React Toxicol Rev 2000; 19: 313–317.
10. Ramesha KN, Rao KB and Kumar GS. Pattern and outcome of acute poisoning cases in a tertiary care hospital in Karnataka, India. Indian J Crit Care Med 2009; 13: 152–155.
11. Garg R, Aggarwal S, Singh H, et al. Study of the relation of clinical and demographic factors with morbidity in a tertiary care teaching hospital in India. Int J Crit Illn Inj Sci 2013; 3: 12–17
12. Singh S, Sharma BK, Wahi PL. Spectrum of acute poisoning in adults. J Assoc Physicians India. 1984; 32: 561–3.
13. Hisham Md, Vijayakumar A, Rajesh N, Sivakumar MN. Auramine O and Malachite green poisoning: Rare and Fatal. Indian Journal of Pharmacy Practice 2013; 6 (4): 72-74.
14. George Tarun K, Chrispal Anugrah, Ramya I, Flemming Joe, Kumar Pradeep, Joy Sneha Anna. The auicidai cow dung powders of Kongunadu. Indian Journal of Forensic Medicine and Toxicology 2014; 8 (2): 134-136.
15. Jose A, Sivanandam S, Matthai J. Poisoning in Children from an educationally and economically advanced urban area of South India. Asian Journal Of Epidemiology 2012: 5; 123-129.
16. Guntheti BK, Singh UP. The Pattern of Poisoning in Khammam. J Indian Acad Forensic Med 2011; 33 (4): 296-300.
17. Maharani B, Vijayakumari N. Profile of poisoning cases in a tertiary care Hospital, Tamil Nadu, India. J App Pharm Sci 2013; 3 (1): 91-4.
18. Sawalha AF, Sweileh WM, Tufaha MT, Al-Jabi DY. Analysis of the pattern of acute poisoning in patients admitted to a governmental hospital in Palestine. Basic Clin Pharmacol Toxicol 2010; 107 (5): 914-8.
19. Pokhrel D, Sirjanapant, Pradhan A, Mansoor. A Comparative retrospective study of poisoning cases in central, zonal and district hospitals. Kathmandu university Journal of science, Engineering and technology 2008; 1 (5): 40-48.
20. Tagwireyi D, Ball DE, Nhachi CF. Poisoning in Zimbabwe: A survey of eight major referral hospitals. J Appl Toxicol. 2002; 22: 99–105.
21. Singh DP, Acharya RP. Pattern of poisoning cases at Bir hospital. J Institute Med 2006; 28: 3–6.
22. Ramesha K N, Krishnamurthy BH Rao, Ganesh S Kumar. Pattern and outcome of acute poisoning cases in a tertiary care hospital in Karnataka, India. Indian J Crit Care Med 2009; 13 (3): 152-155.
23. 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 Pacific J Med Toxicol 2014; 3: 36-40.
24. Dash S K, Raju A S, Mohanty M K, Patnaik K K , Mohanty S. Socio demographic profile of poisoning cases. Journal of Indian Academy of Forensic Medicine 2005; 27 (3): 133-138.
25. Shoaib Zaheer M, Aslam M, Gupta V, Sharma, Khan S A. Profile of poisoning cases at a North Indian Tertiary Care Hospital. Health and Population: Perspectives and Issues 2009; 32 (4): 176-183.

DOI: 10.14260/jemds/2014/3692

26. Singh S, Singh D, Wig N, Jit I, Sharma BK. Aluminium phosphide ingestion – a clinicopathological study. J Toxicol Clin Toxicol 1996; 34: 703-706.
27. Hajouji Idrissi M, Oualili L, Abidi K, Abouqal R, Kerkeb O, Zeggwagh AA. Severity factors of aluminium phosphide poisoning (Phostoxin). Ann Fr Anesth Reanim 2006; 25 (4): 382-385.

Age in years	Male			Female		
	Married	Unmarried	No (%)	Married	Unmarried	No (%)
11 to 20	-	20	20 (12.5)	12	48	60 (37.5)
21 to 30	-	12	12 (7.5)	32	12	44 (27.5)
31 to 40	-	4	4 (2.5)	-	-	-
41 to 50	-	-	-	-	-	-
51 to 60	4	-	4 (3.5)	-	-	8 (5)
61 to 70	8	-	8 (5)	-	-	-
Total	**48 (30%)**			**112 (70%)**		

Table 1: Age, Marital status and sex wise distribution of patients

Sl. No.	Occupation	No.	Percentage
1	Students	80	50
2	House wives	40	25
3	Daily wage labourer	16	10
4	IT field	12	7.5
5	Farmer	4	2.5
6	Retired	4	2.5
7	Others	4	2.5
Total		**160**	**100**

Table 2: Percentage distribution of patients based on occupation

Time	No. of cases (Percentage)
< I hour	44 (27.5)
1 - 6 hours	92 (57.5)
6 - 12 hours	12 (7.5)
12 - 24 hours	12 (7.5)
> 24 hours	0
Total 160	

Table 3: Time elapsed to arrive at hospital since exposure to poison

DOI: 10.14260/jemds/2014/3692

Sl. No	Type of poison	No. of deaths	Mortality rate
1	Rat Killer	3	37.50%
2	Yellow cowdung powder	3	3.75%
3	Others	0	0

Table 4: Mortalty rate based on different poisons

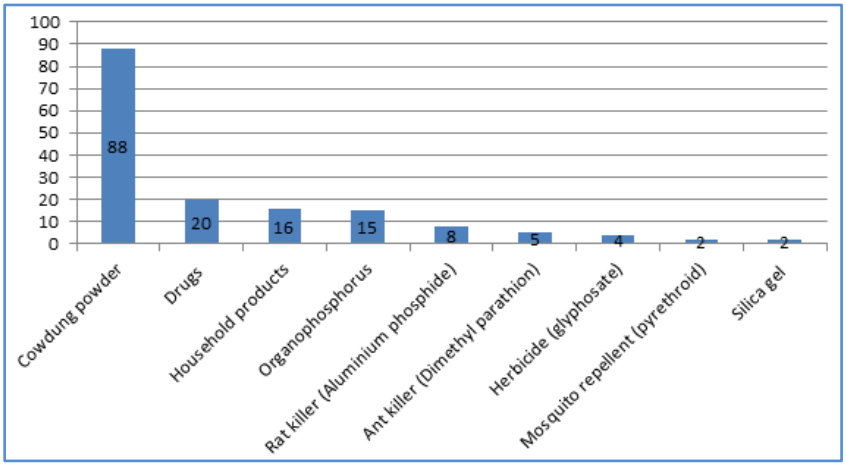

Figure 1: Distribution patients based on type of poisons

AUTHORS:

1. T. Karikalan
2. M. Murugan

PARTICULARS OF CONTRIBUTORS:

1. Assistant Professor, Department of Forensic Medicine, Karpagam Faculty of Medical Sciences and Research, Othakkalmandapam, Coimbatore.
2. Professor, Department of Forensic Medicine, Karpagam Faculty of Medical Sciences and Research, Othakkalmandapam, Coimbatore.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. T. Karikalan,
Assistant Professor,
Department of Forensic Medicine,
Karpagam Faculty of Medical Sciences and Research, Othakkalmandapam,
Pollachi Main Road,
Coimbatore-32, Tamil Nadu.
Email: drkari99cmc@gmail.com

Date of Submission: 14/10/2014.
Date of Peer Review: 15/10/2014.
Date of Acceptance: 25/10/2014.
Date of Publishing: 27/10/2014.