

Changing Trends of Poisoning at Salem, Tamilnadu: A Retrospective Study

Vijaya Kumari N¹, Vipparala Koteswara Rao², B Maharani³

How to cite this article:

Vijaya Kumari N, Vipparala Koteswara Rao, B Maharani. Changing Trends of Poisoning at Salem, Tamilnadu: A Retrospective Study. Indian J Forensic Med Pathol. 2020;13(2):321-325.

Abstract

Knowledge of profile of poisoning of a particular area and of particular time period is very important as it will help the health providers and policy-makers to plan & equip accordingly. Demographic profile of the patients and type of poisons consumed depends upon the availability of substances locally, their socioeconomic and cultural backgrounds. The present study was conducted at Annapoorna Medical College and Hospital, Salem, Tamilnadu in the year 2019. Data regarding age, sex, religion, occupation, locality (urban/rural), marital status & type of poison was collected in Pre-structured Proforma from two 3 yrs periods, 2007-2009 and 2016-2018. The variables from the two periods were compared to find out whether there were any changes. In the present study, the sex ratio, F:M changed from 1:1.6 to 1:1, there was increase in number of female cases in the later phase. With respect to age, there was almost doubling in number of cases in the age group of 11-20 yrs, from 26 cases (17.3%) to 54 cases (31.8%). Poisoning due to insecticides had decreased significantly in the later phase, from 99 cases (66.7%) to 43 cases (25.3%), whereas, there was increase in poisoning due to herbicides from 9 cases (6%) to 37 cases (21.8%), poisoning due to rat killers increased from 17 cases (11.33%) to 42 cases (24%) and household poisons from 3 cases (2%) to 13 cases (7.6%).

Keywords: Acute poisoning; Trends; Poisoning agents; Salem.

Introduction

Poisoning is one of the common medical emergencies encountered in our practice. It is the 4th most common cause of mortality in India.¹ Knowledge of profile of poisoning of a particular area and of particular time period is

very important as it will help the health providers and policy-makers to plan & equip accordingly. Demographic profile of the patients and the type of poisons consumed depends upon the availability of substances locally, their socioeconomic and cultural backgrounds.

In developing countries, poisoning with Pesticides was found to be the most common and in urban areas drugs such as benzodiazepines and antipsychotics were being used.² India being an agricultural country, most common poisons consumed are insecticides.³⁻⁶ In developed countries, it has been observed that poisoning deaths are mainly due to cleansing agents, detergents, paracetamol, carbon monoxide and other cosmetic products.⁷

In the present study, we want to study and analyze whether there are any changes in the demographic profile & type of poisoning due to urbanization, rapid industrialization, increased literacy, changing lifestyle, introduction of newer range of pesticides and drugs, etc.

Authors Affiliation: ¹Associate Professor, ²Assistant Professor, Department of Forensic Medicine, Annapoorna Medical College and Hospital, Salem, Tamilnadu 636308, India. ³Associate Professor, Department of Pharmacology, Indra Gandhi Medical College & Research Institute, Puducherry 605009, India.

Corresponding Author: Vijaya Kumari N, Associate Professor, Department of Forensic Medicine, Annapoorna Medical College and Hospital, Salem, Tamilnadu 636308, India.

E-mail: drvijfm@gmail.com

Received on 22.02.2020, **Accepted on** 19.03.2020

Materials and Methods

The present study was conducted at Annapoorna Medical College and Hospital, Salem, Tamilnadu in the year 2019. Data was collected from the hospital records of acute poisoning cases admitted to rural tertiary care centres at Salem, Tamilnadu Nadu and analysed with respect to age, sex, religion, occupation, locality (urban/rural), marital status & type of poison. The patients included in this study were those who were exposed to agricultural poisons, household poisons, plant poisons, drugs, bites and other miscellaneous poisons. Data regarding age, sex, religion, occupation, locality (urban/rural), marital status & type of poison was collected in Pre-structured Proforma from two 3 yrs periods, 2007–2009 and 2016–2018. The

variables from the two periods were compared to find out whether there were any changes. Data was entered in Microsoft Excel and analysed. Descriptive statistics and frequencies were used for data presentation.

Results

In the present study which was done in two 3 yrs periods each, during 2007–2009 and 2016–2018 with an interval of 6 yrs, the total number of cases studied were 150 cases and 170 cases respectively. There was slight increase in the number of cases in the later phase. The sex ratio, F:M changed from 1:1.6 to 1:1; there was increase in number of female cases in the later phase (Table 1).

Table 1: Sex wise distribution of cases

Sex	2007–2009		2016–2018	
	No of cases	Percentage	No of cases	Percentage
F	58	38.7	84	49.4
M	92	61.3	86	50.6
Total	150	100.0	170	100.0

With respect to age, in the age group of 11–20 yrs, there was almost doubling in number of cases, from 26 cases (17.3%) to 54 cases (31.8%) (Table 2). The number of cases with respect to marital status

remained the same in both the phases. With respect to locality, Urban to Rural ratio was 1:9.7 to 1:7.9; there was slight increase in the urban cases in the later phase.

Table 2: Age wise distribution of cases

Age in years	2007–2009		2016–2018	
	No of cases	Percentage	No of cases	Percentage
0–10	0	0.0	4	2.4
11–20	26	17.3	54	31.8
21–30	78	52.0	60	35.3
31–40	19	12.7	32	18.8
41–50	13	8.7	11	6.5
51+	14	9.3	9	5.3
Total	150	100.0	170	100.0

In the earlier phase, maximum number of cases were among Housewives were 42 cases (28%) and labourers 39 cases (26%). In the later phase other than farmer and housewives, there was increased

incidence of poisoning among students, almost doubling, from 25 cases (16.7%) to 54 cases (31.8%) (Table 3)

Table 3: Distribution of cases according to occupation

Occupation	2007–2009		2016–2018	
	No of cases	Percentage	No of cases	Percentage
Business	9	6.0	5	2.9
Toddler	0	0.0	1	0.6

Occupation	2007-2009		2016-2018	
	No of cases	Percentage	No of cases	Percentage
Driver	13	8.7	1	0.6
Farmer	20	13.3	33	19.4
Housewife	42	28.0	56	32.9
Labourer	39	26.0	18	10.6
Retired	0	0.0	1	0.6
Student	25	16.7	54	31.8
Unemployed	2	1.3	1	0.6
Total	150	100.0	170	100.0

With respect to religion, maximum numbers of cases were Hindus in both the phases. Poisoning due to insecticides (organo-phosphorus compounds, organochlorines, carbamates, aluminium phosphide, ant powder, cowdung powder, imidacloprid, pyrethroids) had decreased significantly in the later phase, from 99 cases (66.7%) to 43 cases (25.3%), whereas there was

increase in poisoning due to Herbicides (paraquat, cypermethrine, sodium acifluorfer), rat killers (3% yellow phosphorus, zinc phosphide), Household cleaning agents (phenol, Lysol, savlon) and drugs (alprazolam, clonazepam, metformin, paracetamol, antihypertensives, anticonvulsants and Thyroxine) (Table 4).

Table 4: Distribution of cases based on type of poisoning

Type of Poison	2007-2009		2016-2018	
	No of cases	Percentage	No of cases	Percentage
Insecticide	99	66	43	25.3
Herbicide	9	6	37	21.8
Cleaning agents	3	2	13	7.6
Rat killer	17	11.33	42	24.7
Plant poison	15	10	16	9.4
Drugs	6	4	10	5.9
Bites	1	0.7	04	2.4
Sulphuric Acid	0	0	01	0.6
Hair dye	0	0	02	1.2
Potash alum	0	0	01	0.6
Unknown	0	0	02	1.9
Total	150	100	170	100.0

Discussion

In the present study, there is slight increase in the number of female cases in the later phase, F:M ratio changed from 1:1.6 to 1:1, ratio is almost equal in recent times. Similar findings were observed in other studies.⁸ This could be because of increase in the number of working women which leads to work and family stress, domestic violence, financial problems, etc. But in most of the studies males outnumbered females.⁹ With respect to age, maximum number of cases is seen in the age group of 21-30 yrs in both the phases, the most active and

productive phase of life. Similar findings were observed in other studies also.⁹⁻¹¹ But we noticed, slight decrease in the number of cases in the later phase, from 78 cases (52%) to 60 cases (35.3%) in this age group. But, there was doubling in the number of cases in the age group of 11-20 yrs, i.e., in adolescents, from 26 cases (17.3%) to 54 cases (31.8%). The reason for this increase was found to be failure in exams, failure in love affairs, impulsive behaviour, immaturity, difficulty in coping up with the competitive life style, etc. In the later phase paediatric cases in the age group of 0-10 yrs, 4 cases (2.4%) were also seen, among them three were accidental and one was homicidal. The number of

cases with respect to marital status remained the same in both the phases. With respect to locality, Urban to Rural ratio, there was slight increase in the urban cases, from 1:9.7 to 1:7.9 in the later phase. Despite India's predominantly rural character, urban preponderance of deaths by poisoning may reflect the role of more stressful life in urban areas. This is mainly due to rapid industrialization, work stress, modern life style, social stress etc.

In the earlier phase, maximum number of cases were among Housewives 42 cases (28%) and labourers 39 cases (26%). In the later phase other than farmer and housewives, there was increased incidence of poisoning among students, from 25 cases (16.7%) to 54 cases (31.8%). So the increasing number of self poisoning among student population seems to be one of the serious global health problems which needs attention, understanding and timely intervention to the problems which students are going through, by the parents, teachers and the law makers is the need of the hour.

With respect to religion maximum number of cases belonged to Hindus, as most of the population here are Hindus. Similar results were seen in other studies also.⁹

Trends of poisoning in a particular region depend mainly on availability of type of poisons. In the present study, poisoning due to insecticides has decreased significantly in the later phase, from 99 cases (66.7%) to 43 cases (25.3%), whereas there is increase in poisoning due to herbicides from 9 cases (6%) to 37 cases (21.8%). Self poisoning due to rat killers is commonly seen in North India.¹²⁻¹⁴ But, in the present study we observed increase in the number of poisoning due to rat killers from 17 cases (11.33%) to 42 cases (24%). Household cleaning agents increased from 3 cases (2%) to 13 cases (7.6%) and also increased in usage of drugs for self poisoning. In addition to this, cases of poisoning with sulphuric acid, hair dye and potash alum was also seen in the later phases. There was not much change in the incidence of cases due to plant poisons. This change in the trends of poisoning, is due to increase in the number of urban cases, increased awareness of more toxic poisons through internet, media etc.

Conclusion

In the present study, we observed significant changes in the trends of poisoning at Salem, Tamilnadu. In the recent time, there is increase in the self poisoning by females, student population

and in urban areas. Acute self poisoning using pesticides have decreased over the time and there is increase in poisoning by herbicides, rat killers, drugs and cleaning agents. Miscellaneous poisons like Sulphuric acid, Potash alum and hair dye was seen in the recent time.

Reducing the morbidity and mortality due to self poisoning, requires identifying the target groups and timely intervention by the family members, friends and the society. There is need to create awareness regarding the hazards of these toxic substances, highlighting the safe practices of proper labelling, preservation and sale. Setting up of helpline and counselling centres in educational institutions, working place, hospitals, etc., might help to reduce cases of self poisoning.

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. Eddleston M. Patterns and problems of deliberate self-poisoning in the developing world. *QJM* 2000;93:715-31.
3. Pillay VV, Arathy SL, Vijesh KP, et al. 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.
4. Sande SD, Kumar PU. Pattern of acute poisoning presenting at a tertiary care hospital. *IOSR J Pharm* 2017;7:39-42.
5. Kirubairaj M, Jagaraj A, Mitra S, 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.
6. Kumar KK, Sattar FA, Bondade S, et al. Gender specific analyses of suicide methods in deliberate self-harm. *Indian J Soc Psychiatry* 2017;33:7-21.
7. Gargi J, Rai H, Chanana A, et al. Current Trends of Poisoning. A Hospital Profile, *Journal of Punjab Academy of Forensic Medicine and Toxicology* 2003;3:41-5.
8. B Bamathy, K Punnagai, Ca Amritha, et al. Incidence & Patterns of Acute Poisoning Cases in an Emergency Department of a Tertiary Care Hospital in Chennai. *Biomedical & Pharmacology Journal* 2017;10(3):1285-91.
9. V Koulapur V, S Pujar S, S Honnungar R, et al. Epidemiological Profile of Pesticide Poisoning Cases in Bijapur, Karnataka in Southwest India: A Retrospective Study. *International Journal*

- of Medical Toxicology and Forensic Medicine 2015;5(4):180-4.
10. Aggarwal, Aggarwal. Trends of poisoning in Delhi. Journal of Indian Academy of Forensic Medicine 1998;2:32-35.
 11. Singh S, Sharma BK, Wahi PL, et al. Spectrum of acute poisoning in adults (10 year experience). J Assoc Physicians India 1984;32:561-63.
 12. Chugh SN. Aluminium phosphide poisoning present status and management. J Assoc Phys Ind 1992;40:401-5.
 13. Subash Vijaya Kumar, B Venkateswarlu, M Sasikala, et al. A study on poisoning cases in a tertiary care hospital. J Nat Sci Biol Med 2010 Jul-Dec; 1(1):35-39.
 14. Vivekanandan et al. A study on poison cases and their management along with poison awareness Educational strategies. Asian J Pharm Clin Res 2012;5(2):71-73.

