

An Autopsy Based Study on Profile of Poisoning Cases in A Tertiary Care Centre

G. Manigandaraj¹, N. Karthikeyan², P. Saravanakumar³, K. Vivek⁴

¹Associate Professor, Department of Forensic Medicine & Toxicology, Government Chengalpattu Medical College, Chengalpattu, Tamil Nadu, India.

²Assistant Professor, Department of Forensic Medicine & Toxicology, Government Chengalpattu Medical College, Chengalpattu, Tamil Nadu, India.

³Third year Post Graduate, Department of Forensic Medicine & Toxicology, Government Chengalpattu Medical College, Chengalpattu, Tamil Nadu, India.

⁴First year Post Graduate, Department of Forensic Medicine & Toxicology, Government Chengalpattu Medical College, Chengalpattu, Tamil Nadu, India.

Received Date: 04/01/2023

Acceptance Date: 10/02/2023

Abstract

Background: One of the leading causes of death and a significant medical emergency is acute poisoning. For the management and prevention of poisoning, a complete understanding of the victim's profile is crucial. The present paper evaluates profile of poisoning deaths during the period of 1-1-2021 to 31-12-2021 in Chengalpattu, Tamilnadu. A total of 185 cases were due to death by poisoning. Of 185 cases,129 cases (69.7%) were males. Peak incidence was observed in the age group 21-30 years(89 cases). 62.6% patients were from rural area. Majority of the victims were literate and married out numbered the unmarried cases. Commonest poisoning was organophosphorus compound in this region.

Key words: Autopsy, Organophosphates, Poisoning, Ingestion, Profile

Corresponding Author: Dr. G. Manigandaraj, Associate Professor, Department of Forensic Medicine & Toxicology, Government Chengalpattu Medical College, Chengalpattu, Tamil Nadu, India.

Introduction

Poison is a material that can injure or kill living organisms when it comes into contact with them or is ingested by them, and it can be employed for this purpose. Acute poisoning is a frequent reason for visits to emergency departments, a leading cause of disease and death in India, and a global public health concern. India is an agricultural country with predominant population from rural area (60-80%), therefore, pesticides are the most common compounds used for poisoning. Poisoning is a medical emergency and a patient is always invariably rushed to the hospital at the earliest possible moment, irrespective of the amount and nature of poison ingested. All the cases of poisoning are admitted through emergency services where the safety of life of the patient is the main issue for the doctor.

Poisoning is seldom included as a priority for the health research in India, even though hundreds of people are losing their lives prematurely from pesticide poisoning. Toxic substances that cause illness, injury, or death may be ingested intentionally or unintentionally, and this can lead to acute poisoning. Many people chose a serene death by poisoning rather than hanging or burning themselves to death. Sickness consumes the true wealth of a nation. Although sickness cannot be avoided or cured but those due to poisoning is largely preventable. But it is a matter of great disappointment that the number of persons in

this state, specifically in this area, suffering from acute poisoning is increasing year by year. Both intentional and unintentional poisoning can occur. An intentional poisoning happens when a substance is taken or given with the aim of harming another person, while an unintentional poisoning occurs when a substance is taken or given for some other reason. Hence, this study was carried out to analyze the various trends in acute poisoning in this region with the aim that it will help immensely the health policy maker to equip health care institutes accordingly.

Aims And Objective

To study the frequently used poisonous substance, to assess the distribution of poisoning among individual of different age and sex, to observe the influence of literacy and socio-economic status on poisoning. To evaluate the occurrence of poisoning under marital status.

Material And Methods

The study was conducted in the Department of Forensic Medicine and Toxicology, Chengalpattu Medical College, Chengalpattu. The study was carried out using record case sheet obtained from the record section of Chengalpattu Medical College. All the case records for the stipulated period of one year i.e. 1-1-2021 to 31-12-2021 were collected and all necessary information were obtained and recorded in the predesigned proforma. Later on from that proforma, we analyzed the various aspects of poisoning, tabulated and compared it with various studies. Particulars in respect of poisons/drugs history, household remedies by the deceased and any peculiar finding seen in the deceased after suffering from poisoning were obtained not only by direct interrogation with the relatives, friends or others accompanying the deceased but also from the police. Identification of etiological/precipitating factor responsible for poisoning was made by discussing the matter with patient or his/her relatives after establishing a proper rapport with them.

Officers from the local police department that were involved in the investigation acquired information about the suspect's family history and medical history, if applicable. Chemical analysis reports were used to examine postmortem findings. In treated instances, information was obtained by reviewing hospital records. A visit to the crime scene or images of the crime scene was used to enhance information in circumstances where there was an allegation. Before dissection, all organs were examined and weighed using the Lettulle evisceration technique. The organs were examined and dissected in accordance with the usual autopsy procedure. The data of certain variables were collected and analyzed in latest version of SPSS regarding age, sex, socioeconomic status, marital status, commonly abused poisons etc.,. The statistical analysis of the data from this study was carried out using relevant tables, as well as descriptive statistics such as percentages, in order to present the information in an understandable manner.

Results

One hundred and eighty five cases of recorded death was due to poisoning during the study period. Total male affected are 129 cases(69.7%)total female is 56 cases (30.2%) (Table - 1). The incidence of poisoning according to age and sex shown in Table - 2 reveals that there is an increasing trend of poisoning with increase in age up to 30 years and then declines with a peak incidence in the age group 21 - 30 years which represented 75 (40.5%) cases in this study. It is evident that 155 (84%) of victims were of medium socio-economic status (Table-3). The domicile pattern of the victims shows 111 (60.1%) cases were from rural area. (Table - 4) Literacy status of the victims reveals that at the time of incidence 125 (68%) cases were literate (Table- 5). Among the 185 cases of total poisoning cases 96 (52%) cases were married. (Table-6) Organophosphorous is the most commonly abused poison. (Table 7)

Table 1: Showing Incidence of Sex

Sex	No.Of.Cases	Percentage
Male	129	69.7%
Female	56	30.2%

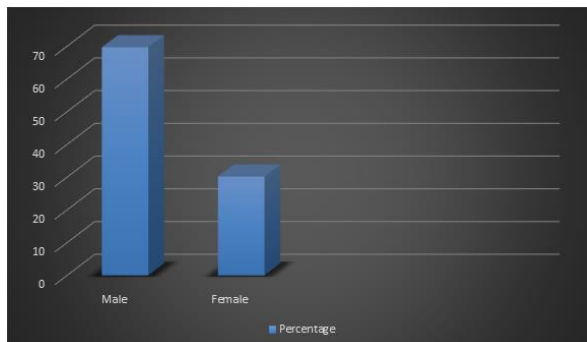


Figure 1: Sex wise distribution

Table 2: Showing the incidence of poisoning according to diff. age

Age in years	No.of.Cases	Percentage
<10	4	2.1%
11-20	37	20.1%
21-30	75	40.5%
31-40	41	21.6%
41-50	24	13.1%
>50	4	1.6%

Table 3: Showing the socio-economic status of the patients

Socioeconomic status	No.of.Cases	Percentage
Low	28	15%
Medium	155	84%
High	1	0.4%

Table 4: Showing domicile pattern of the victims

Domicile	No.of.Cases	Percentage
Rural	111	60%
Urban	73	40%

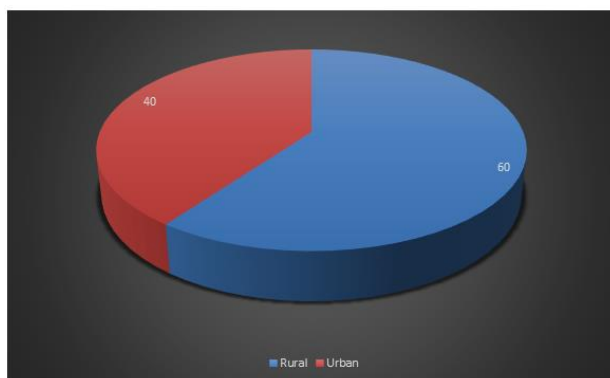


Figure 2: Domicile pattern of victims

Table 5: Showing literacy status of the victims

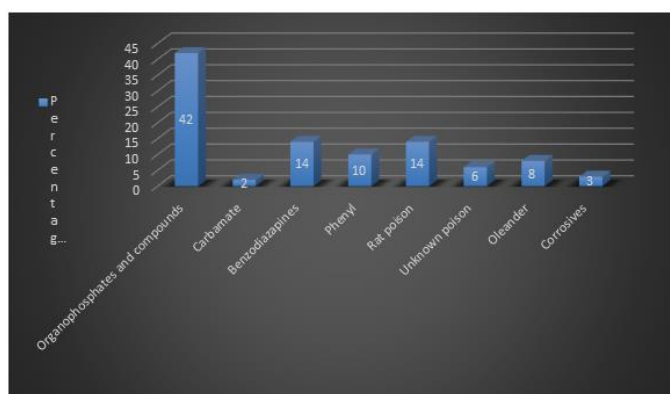
Literacy	No.of.Cases	Percentage
Literate	125	68%
Illiterate	60	32%

Table 6: Marital status of the victims

Marital Status	No.of.cases	Percentage
Married	96	52%
Unmarried	89	48%

Table 7: Showing the commonly abused poisons by the victims

Poison Abused	No.of.Cases	Percentage
Organophosphates and compounds	77	42%
Carbamate	4	2%
Benzodiazapines	26	14%
Phenyl	18	10%
Rat poison (Zinc Phosphide,Aluminium phosphide)	26	14%
Oleander	15	8%
Corrosives	6	3%
Kerosene	2	1%
Unknown poison	11	6%

**Figure 3: Commonly abused poisons**

Discussion

Poisoning fatalities are an unavoidable element of all unnatural deaths in today's world of cultural, social, and personal dilemmas. Poverty, stress, financial insecurity, unemployment, personal disputes, psychological disorders, difficulties in psycho-social adaptation, bad health and loneliness all play a key role in the ever-increasing mortality rate in poison deaths. In current study mostly cases i.e. males it amounted to 69.7% and females 30.2%. This can be credited to the point that males who form the majority of the population, being the breadwinner of the family, have to shoulder many responsibilities leading to their risk-taking and aggressive behavior making them more vulnerable. Whereas, in women due to , social values and post-marital problems in the form of cruelty by husband/in-laws are falling prey to suicides by poisoning. Similar findings were observed in the study conducted by Kanchan T, Menezes RG and study conducted by Vijaynath V, et.al. In this study, the maximum number of cases i.e. 75 were in the age group of 21-30 years (40.5%), followed by 41 in the age group of 31-40 years (13.1%). Ambition, adventurous mind, aggressive personality, opportunity hunting, academic pressure and challenges, allure of opposite sex affect the

abovesaid age group . Easy availability over the counter as well as an accessible poison in the form of insecticides especially in the house of farmers, cost effectiveness, fatal nature of the compound, awareness about toxicity of compound among general population make organophosphorus compound the most common poison encountered. Its effectiveness as a rodenticide, regular use in grain storage, unsafe storage practices and easy accessibility as a household poison especially among women, makes Phosphide compounds second most popular. The findings are in accordance with the findings observed in the study by Shetty AK, Jirli PS, Bastia BK, Somnath Das, Subhasish Saha, Debasish Guha et.al.

Conclusion

The most common form of poison taken by this research study is organophosphorus pesticides. Males are more likely to be poisoned than females. In both rural and urban communities, married people outnumbered single people. Based on the information provided by the police and families of the deceased, the suspected type of poison in the majority of the victims was well known in major cases, prior to autopsy. The reason for Organophosphorus being the preferred poison is due to the high exposure of individuals to the chemical which is very easily available and accessible owing to the extensive agricultural background of this region. Adults have been found to be the greatest number of cases in suicidal poisoning and children have been found mostly to be the victims of accidental poisoning. The reason for physical illness to be touted as the main reason as obtained from the the police reports for poisoning can be assumed that it is because of the relatives of the deceased reporting that they would have allegedly consumed poison due to their unfounded fear of police inquiry or tainting of family honour.

Recommendations

- In lieu of organophosphorous compounds being the most rampant poison among the population , the availability of these should be curtailed by stringent legal means .
- The poisoning in children happens accidentally . The hazardous chemicals must be made sure that they are kept out of reach of children.
- There must be adequate poison information centres in a region to provide an insight on the changing trends in poisoning and the information about any poison and its management . Awareness among the public is also a necessary factor to prevent this high incidence of poisoning.
- The young adults can be dissuaded from turning to poison when their times are tough by proper parental guidance .

References

1. Singh S, Wig N, Chaudhary D, Sood NK and Sharma BK. Changing pattern of acute poisoning in adults: Experience of a large North-West Indian Hospital(1970-1989) JAssoc Physic India. 1997;45: 194-197.
2. Elif D, Akgur SA, Ozturk P and Sen F. Fatal poisoning in Aegean region of Turkey. VetHumToxicol. 2003; 45: 106-108.
3. Senanayake N and Peris H. Mortality due to poisoning in a developing agricultural country: trends over 20 years. Hum Exp Toxicol.1995;12: 435-438.
4. Nhachi CF and Kasila OM. The pattern of poisoning in Urban Zimbabwe. J Appl Toxicol.1992; 12: 435-438.
5. Rostrup M, Tonjum T and Ekeberg O. Self poisoning in North-West Norway in 1975-1984. Tidsskr Nor Laegeforen. 1989; 109:173-176.
6. Dhatarwal SK and Singh H. Profile of deaths due to poisoning in Rohtak, Haryana. Journal of Forensic Medicine and Toxicology.2001;18:28-29.

7. Sethi B, and Lal N. Demographic and socioeconomic variables in attempted suicidal poisoning. *Indian J Psychiatry* 1975; 17: 100-2.
8. Smith AJ. Self poisoning with drugs: worsening situation. *BMJ* 1972; 4:157-9.
9. Dhattarwal SK, and Singh H. Profile of deaths due to poisoning in Rhotak, Haryana. *J Forensic Med Toxicol* 2001; 18: 28-29.
10. Khosla SN, Nand N, Kumar P, Trehan V. Muscle involvement in aluminium phosphide poisoning. *J Assoc Phys India* 1988; 36: 289-90.
11. Pillay VV. *Comprehensive Medical Toxicology*. 1st Ed. Bangalore: Paras publications; 2003. p.191
12. Kanchan T, Menezes RG. Suicidal poisoning in Southern India: gender differences. *J Forensic Leg Med*. 2008 Jan; 15(1): 7-14.
13. Vijayanath, V, Anitha MR, Raju GM, Vijayamahantesh SN. Forensic View on Aluminium Phosphide Poisoning. *J Indian Acad Forensic Med*. 2011 Oct-Dec; 33(4): 289-91.
14. Singh B, Unnikrishnan B. A profile of acute poisoning at Mangalore (South India). *J Clin Forensic Med*. 2006 Apr; 13(3): 112-6.
15. Dipayan Deb Barman, Vijaya Kumar Nair. G, R. Karnaboopathy. Study of the Trend of Poisoning in a Tertiary Care Hospital in Chidambaram, Tamilnadu. *J Indian Acad Forensic Med*. 2017 Jan –Mar; 39(1): 20-24.
16. B.R. Sharma, Nidhi Relhan, Neha Gupta, Harshabad Singh. Trends of Fatal Poisoning in Northern India: A Ten-year Autopsy Analysis. *J Pharm Toxicol* 2007; 2(4): 350-358.