



## **A study on death due to poisoning in a tertiary care hospital in Tamilnadu. - A one-year study**

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### **ABSTRACT**

*Poisoning due to chemicals and drugs are an important global problem which has steadily increased over the past few years in developing countries and has become as one of the major cause of death in these countries. The aim of our study was to assess the death due to common chemical and drug poison in a tertiary care hospital, Tamilnadu and analyze the factors associated with these poisoning cases. A retrospective study was conducted. Data was collected from the Department of Forensic Medicine and deaths due to chemical and drug poisoning were recorded during the year 2017. Data on age, sex, marital status, occupation, type of poison, locality were analyzed by descriptive method. Among 185 deaths, 183 deaths were due to intentional poisoning and two deaths were due to accidental poisoning. In all the cases the route of exposure was oral. Males were common (129 deaths) than females (55 deaths) and only one child. Out of 185 deaths, 102 cases were married; peak occurrence was in the age group of (21-30). According to occupation wise poisoning was commonly found among coolies 118 deaths (63.78%) and farmers 25 (13.51%) followed by house wives 10 (5.4%), Students 6 (3.24%) and private job 23 (12.43%). Our study concluded that organophosphorus was the commonest agent used as chemical poisoning and there were 162 deaths (87.56%) due to this poisoning. By implementation of effective preventive strategies, the death due to chemical and drug poisoning can be reduced.*

*Key words: Organophosphorus agents, aluminium phosphide, Endosulfan*

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### **INTRODUCTION**

Poisoning, both unintentional and intentional is a considerable contributor to the mortality and morbidity throughout the world. Both sexes are equally involved among all age groups everywhere and the incidence of poisoning with reference to insecticides, pesticides and rodenticides has become more common than others in the contemporary period because of their easy obtainability, low price, efficiency of action and speedy death. Several studies have acknowledged pesticides as common chemical poison. [1] According to the World Health Organization (WHO), globally more than three million cases of acute poisoning with 2, 20,000 deaths occur annually. [2] It is noted that in India five to six persons per lakh of population die due to acute poisoning every year. [3] In developed countries, the poisoning death are mainly due to cleaning agents, carbon monoxide, detergents, and cosmetic products.[4] Since agriculture is the main occupation in India, Insecticides and fertilizers are more commonly used as chemical poison.<sup>5</sup> Regarding various studies organophosphate forms the commonest poisoning agents. [6, 7, 8, 9 and 10] Usually accidental poisoning was more common in children and suicidal poisoning was common in adults.[11] Hence this present study was carried out to find out the common chemical and drug poison which produces death in tertiary care hospital in Tamilnadu.

### **MATERIALS AND METHODS**

Study Design : Retrospective study

Study place : Tertiary care hospital, Tamilnadu

Study subjects : n= 185 cases of death due to acute poisoning by chemicals and drugs.

Methods : After getting approval from the ethical committee of our institute, Data regarding age, sex, marital status, occupation, locality, type of poison were collected from records in Forensic Medicine Department.

Inclusion criteria: Death due to acute poisoning by chemicals and drugs were included.

Exclusion criteria: Death due to snake bite, insect bite, food poisoning and allergic reactions to drugs were excluded in this study.

Data was analyzed by descriptive statistical method.

## RESULTS

In our study, 185 cases of death due to chemical and drug poisoning were reviewed retrospectively. Among 185 deaths, 183 (98.91%) were due to intentional poisoning and two cases were due to accidental poisoning. The route of poisoning was ingestion in all our observed cases. 177 cases were admitted in the tertiary care hospital and treated, finally ended in death and 8 cases were brought dead. Among 185 deaths, males were 129 (69.72%), females 55 (29.73%) and only one child. Out of 185 deaths, 120 (64.86%) were married. Peak occurrence of death was in the age group of 21-30 years is 100 (54.05%). (Table1) According to the occupation, poisoning was commonly found among coolies 118 (63.78%) and farmers 25 (13.5%) followed by private jobs 23 (12.43%), house wives 10 (5.41%), and students 6 (3.24%). (Table 2) In this study among pesticide, Organophosphate compound was the commonest poisoning in which 162 deaths (87.56%) had occurred followed by Oleander Poisoning (4.32%). Among the drug poisoning one for Benzodiazepines (0.54%) and one for anti-depressant (0.54%) were observed. (Table 3) Regarding the locality, death was reported more commonly in rural area (62.16%) followed by urban area (37.84%). (Table 4).

## DISCUSSION

In our study commonest chemical poison was organophosphate compound, which produce symptoms like increased saliva, lacrimal production, diarrhea, vomiting, constricted pupils, sweating, muscle tremors and confusion. In our study Organophosphate poisoning was common (87.56%), this was also documented in a study done by Eddleston et al. [12] The underlying mechanism of action involves the inhibition of acetyl cholinesterase leads to accumulation of acetylcholine in the body. [12] The primary treatment is atropine, oximes such as pralidoxime and diazepam. [12,13] In our observation, as agriculture is the main occupation of the people and organophosphorus are commonly used pesticide in this area, the most commonly used chemical poison is also organophosphophate, followed by other chemicals. This is evident from other studies done in South India. [6, 7, 8, 9 and 10] In contrast, the incidence of Aluminium Phosphide suicidal poisoning was found to be high in North Indian studies where they use this chemical as a grain fumigant. [14, 15, 16, and 17] In our study death due to Aluminium Phosphide is only 2.16%. In developed countries, cosmetic products and cleaning agents are the commonest poisoning but in our region it is very less.[4] Among 185 deaths, 98.91% was intentional poisoning and two deaths (0.02%) were due to accidental poisoning which is Similar to the study done by Das et al.[11] Various International studies had projected that there has been increasing incidences of intentional poisoning and to justify those studies, our study also was showing 98.91% of intentional poisoning. Also our study revealed that higher suicidal death was found among males (69 -72%) than females (29-73%) and the same was declared by Singh et al and Das et al, whereas in the study by Sharma et al both the genders were equally affected. [18, 19, and 20] But contradictory findings were noted in Nepal by Pokhrel et al, [21] in which the incidence of poisoning was more common among females. Moreover, the drug poisoning due to Benzodiazepines and antidepressants are mainly due to overdosing and of intentional poisoning. Factors like dowry, family quarrels, dependence of women on husband are responsible for poisoning among females, mainly housewives. Peak occurrence of death was in the age group of 21-30 years (54.05%) and which can be explained by the fact that the persons of this age group are suffering from stress of the modern life style, failure in love, nuclear family concept, more expectations from the family etc., Our study revealed, occupationally, more poisoning death were found among coolies (63.78%) and farmers (13.51%) which was similar with study done by Vinay et al in which he observed higher incidence of poisoning among coolies and farmers. Poverty, inadequate income to run the family, Monsoon failure was responsible for higher incidence of poison death among farmers and labourers. [9] Early marriages, rural community, family responsibilities, social custom was the cause for higher incidences of poisoning among house wives.

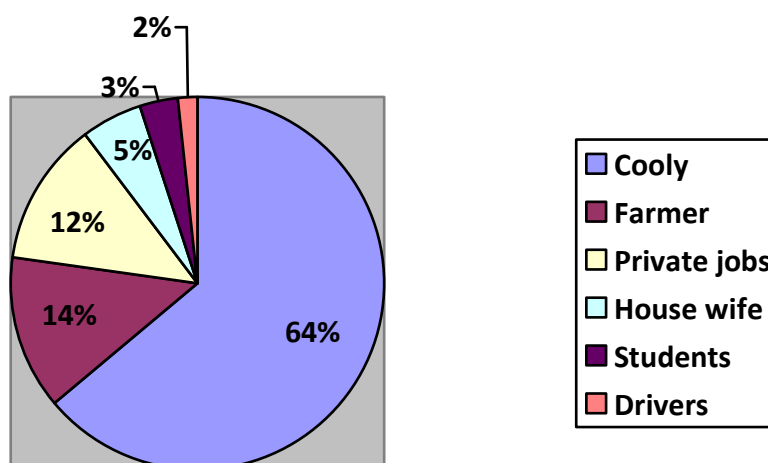
As we intended to prevent the death due to poisoning, certain preventive strategies are mandatory to be implemented, so that the incidences of death due to chemical poisoning can be reduced markedly. Prevention includes, banning of very toxic type of organophosphates in the pesticides [12] those who work with pesticides should take protective measures and showering before going home. [22] Primary

health centers should be upgraded to provide immediate effective treatment for poisoning. All district hospital should have separate toxicological unit in dealing with clinical poisoning cases. Educating NGOs, village head and other volunteers about the first aid treatment of poisonings at household level, counseling should be given to adolescents at schools and colleges about the chemical and drug poison and also about the first aid treatment. Marriage counseling and strict implementations of anti - dowry act and women empowerment will help in decreasing the day to day tension in married life.

**Table 1: Socio demographic profile of the subjects**

Age in years	Male (n= 129 )69.72%			Female (n= 55) 29.73%		
	Married (%)	Unmarried (%)	Total (%)	Married (%)	Unmarried (%)	Total (%)
1-11	-	-	-	-	0.54	0.54
12-20	-	2.16	2.16	-	2.16	2.16
21-30	16.26	20.54	36.75	11.89	-	17.29
31-40	10.81	4.32	15.13	8.64	-	8.64
41-50	5.40	-	5.40	-	-	-
51-60	7.56	-	7.56	1.08	-	1.08
61-70	2.162	-	2.16	0.54	-	0.54
71-80	0.54	-	0.54	-	-	-

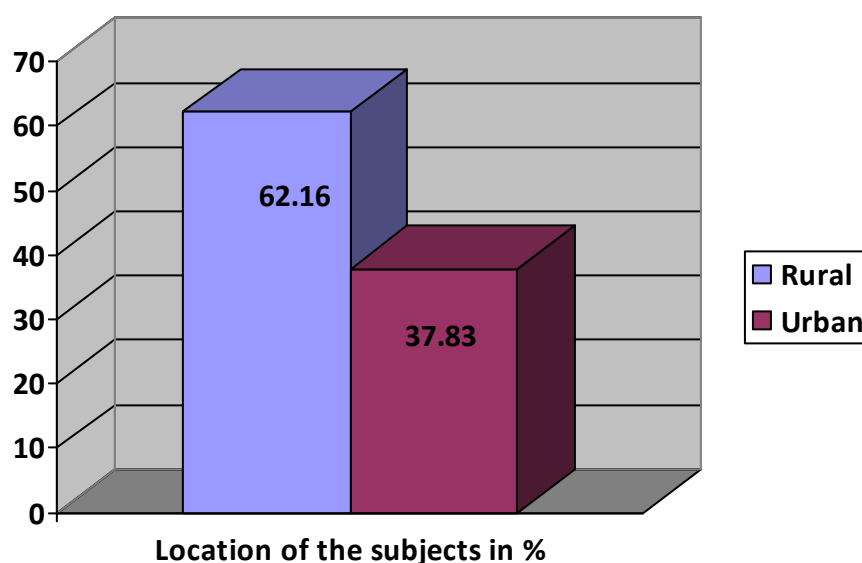
**Table2: Occupation of the subjects**



**Table3: Types of Poison**

S.No	Type of Poison	No of death in %
1.	Organophosphate	87.56
2.	Rat killer	1.08
3.	Toilet cleaning agents	1.08
4.	Oleander poisoning	4.32
5.	Aluminium Phosphide	2.16
6.	Endosulphan	2.70
7.	Benzodiazepines	0.54
8.	Antidepressants	0.54

Table 4: Location of the subjects



## CONCLUSION

Our study concluded that deaths due to chemical poison are commonly due to organophosphate agents. The occurrence was high among married males in the age group of 21-30 years. Maximum number of death mainly occurs in rural areas. The chemical and drug poisoning deaths can be prevented by implementation of effective preventive strategies.

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