



A STUDY ON DEMOGRAPHIC PROFILE OF DEATHS DUE TO ORGANOPHOSPHORUS COMPOUND POISONING

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ABSTRACT

Introduction: Poisoning is a global issue occurring all over the world involving people of all ages and sexes, from all economic and ethnic groups. It is estimated that there are over 3million cases of Organophosphorus (OP) compound poisoning per year worldwide with approximately 300,000 deaths. Self poisoning with OP compound poisoning is very common among the rural agricultural workers in India. **Aim of study:** To assess the demographic factors of OP compound poisoning with respect to age, sex, marital status, religion, occupation, predisposing factors for poisoning and manner of poisoning. **Methods:** A total of 54 cases of op compound poisoning brought to mortuary for Medico-Legal Autopsy at Government General Hospital, Ananthapuramu were analysed during 1 year from January 2021 to December 2021. Only the cases, where OP compound poisons detected by chemical analysis of viscera samples sent to Andhra Pradesh Regional Forensic Science Laboratory, Tirupati were included in the study. **Results:** The maximum incidence of suicidal deaths from OP compound poisoning was seen in 41-50 years age group in males and 21 -30 years age group in females. There was preponderance of male sex over female sex. Hindus were the most common religion. Married victims were more common. Farmers were the most common occupation involved. Financial problems, health problems, marital friction were the most common predisposing factors for poisoning. Suicide was the most common manner of poisoning. **Conclusion:** The analysis reveals that OP compounds are commonly ingested with suicidal intent due to their easy availability by the rural population, more commonly in males with health and financial problems.

KEYWORDS : Organophosphorus (OP) compound, Demographic factors, Suicidal

INTRODUCTION:

Pesticide poisoning is a leading cause of death in India. Pesticides, insecticides, herbicides, and chemical warfare agents all use organophosphorus (OP) compounds.¹They play an important role in suicidal, accidental, and homicidal poisoning cases. There is no restriction on their sale in India, and anyone can buy it over the counter, so the number of poisoning cases has increased in recent years. Because of their ease of access, low cost, and rapid lethality in small doses, OP compounds are ideal for suicidal poisoning.

Poison can be absorbed through the respiratory system, the gastrointestinal tract, or through contact with the body's surface, resulting in accidental or industrial poisoning with morbidity or mortality.²

The current study was conducted to determine demographic factors such as age, sex, marital status, religion, occupation, predisposing factors for poisoning and manner of poisoning.

MATERIALS AND METHODS:

Cases of confirmed deaths due to OP compound poisoning brought to mortuary for Medico- Legal Autopsy at Government General Hospital, Ananthapuramu were included in the study. From January 2021 to December 2021, total 206 poisoning cases were autopsied out of which 54 cases of organo phosphorus compound poisoning detected from viscera by Toxicological / Chemical Analysis , RFSL , Tirupati, Andhra Pradesh were taken for consideration in this study. Ethical clearance for the study was obtained from Institutional Ethical Committee.

For present study, the data is collected from the following sources:

1. Post Mortem Examination Reports

2. Inquest Reports
3. FIR copy
4. Complainant Report
3. Chemical Analysis Reports, RFSL, Tirupati, Andhra Pradesh.
4. Mortuary Register
5. Hospital Case Records, Government General Hospital, Ananthapuramu in cases where deceased died during treatment.
6. Information from deceased relatives and Investigating Officer. Information of the deceased regarding age, sex, marital status, religion, Occupation, predisposing factors for poisoning, manner of poisoning was documented and all 54 cases were subjected for toxicological / chemical analysis.

OBSERVATIONS & RESULTS:

Total 54 Cases of deaths due to organophosphorus compound poisoning detected from the viscera by Toxicological / Chemical Analysis, RFSL, Tirupati, Andhra Pradesh were included in the present study.

Table 1: Sex wise distribution of cases of Organo phosphorus poisoning

Sex	Number	%
Male	39	72.22
Female	15	27.78
Total	54	100

A total of 54 cases of OP compound poisoning were included in the current study out of which 39 cases (72.22%) were males and 15 cases(27.78%) were females. It shows the preponderance of males over females.

Table 2: Age wise distribution of cases of poisoning with sex

Age Group (in Years)	Sex				Total	
	Male		Female			
	No. of Cases	%	No. of Cases	%	No. of Cases	%
0 -10	0	0	0	0	0	0
11- 20	2	3.70	3	5.56	5	9.26
21- 30	9	16.67	6	11.11	15	27.78
31- 40	10	18.52	3	5.56	13	24.07
41- 50	12	22.22	2	3.70	14	25.93
51- 60	2	3.70	0	0	2	3.70
>60	4	7.41	1	1.85	5	9.26

In males, the maximum number of poisoning cases (22.22%) were between the age 41- 50 years and in females, the maximum number of cases (11.11%) were between the age 21-30 years.

Marital Status

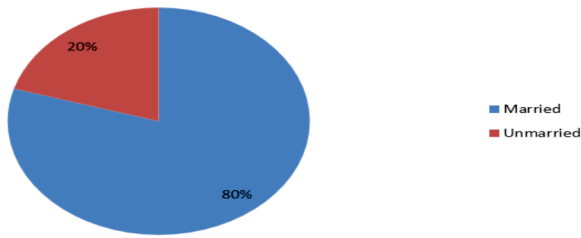


Figure 1: Distribution of cases in relation to Marital status

80% of the cases were married and remaining 20% cases were unmarried

Religion

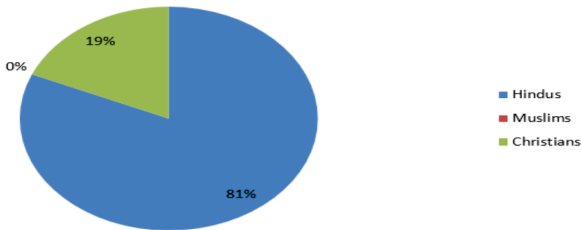


Figure 2: Distribution of cases in relation to religion

81% of the total cases belonged to Hindu religion, 19% of cases belonged to Christians.

Table 3: Occupation of cases of Organophosphorus poisoning

Occupation	Cases	%
Farmers	21	38.89%
House wives	6	11.11%
Labourers	7	12.96%
Students	2	3.70%
Drivers	1	1.85%
Businessmen	0	0%
Others	17	31.49%
Total	54	100%

Farmers topped the list with 38.89%, followed by others with 31.49%.

Table 4: Predisposing factors of Poisoning

Predisposing factors for poisoning	Male		Female		Total	
	No. of cases	%	No. of cases	%	No. of cases	%
Financial Problems	16	29.63	1	1.85	17	31.48
Health Problems / Chronic illness	9	16.67	3	5.55	12	22.22

Dowry Harassment	0	0	1	1.85	1	1.85
Personal relations / Love Failure	0	0	1	1.85	1	1.85
Educational Stress / Failure in exams	0	0	1	1.85	1	1.85
Unemployment	3	5.55	0	0	3	5.55
Family problems	8	14.81	0	0	8	14.81
Separation / death of close persons	0	0	1	1.85	1	1.85
Psychiatric disorder	1	1.85	3	5.55	4	7.40
Alcohol abuse	5	9.26	0	0	5	9.26
Marital friction	3	5.55	2	3.71	5	9.26

In males, the most common cause for suicidal consumption of OP compound poisoning was financial problems in males (29.63%) followed by health problems(16.66%), family problems(14.81%) and alcohol abuse (9.26%). In females, the most common cause for poisoning is health problems(5.55%) followed by psychiatric disorders(5.55%) and marital friction(3.70%). Hence the financial problem was the common predisposing factor for poisoning in both sexes.

Table 5: Manner of death of Poisoning cases

Manner of death of poisoning cases	No. of Cases	Percentage (%)
Suicides	53	98.15%
Accidental	0	0%
Homicides	1	1.85%
Total	54	100%

Out of 54 poisoning cases ,Suicidal poisoning cases were more common (98.15%) than homicidal (1.85%) and accidental poisoning(0%) .

DISCUSSION:

India has an economy that is primarily centred on agriculture. Although these substances resemble Over the Counter (OTC) drugs, which are sold at reasonable prices, poisoning from OP compounds is frequent in rural communities in India.³

The study shows the preponderance of males over females.^{3,4} The maximum incidence of mortality from OP compound poisoning is seen in age group of 41 – 50 years in males and 21-30 years in females. This is the age group in India where they must take over the duties of the household. Unfortunately, some people are unable to bear this weight, and as a result, this age group accounts for the majority of poisoning-related deaths.

Everyone, regardless of wealth, education level, employment status, or place of residence, is susceptible to suicide fatalities caused by OPcompound poisoning.⁴

Most studies from India and other countries, such as Nepal, found that OP compounds were involved in the majority of suicidal incidents (98.15 percent in the current study).

In the present study incidence of OP compound poisoning was more in males (72.22%) which was similar to Bijawat Vishva Deepak et al, Narayana Reddy M et al and Selvam G P et al.

80% of the deceased were married and 20 % were unmarried. 81% of the cases belonged to Hindu religion and the rest of the 19% cases belonged to Christians.⁵

Suicide was the most common manner of poisoning. The commonest cause for suicides from OP compound poisoning is financial problem in both the sexes.⁴ In cases of suicidal poisoning due to financial problems, the deceased are exclusively males (29.62%), as male sex is considered the breadwinner in the family, which is subjected to stress arising from financial management.⁴ In females, health problems

(5.55%) is cited as commonest cause for suicidal poisoning. During Autopsy, no appreciable findings related to health problems were found in all cases.⁴

Toxicological analysis detected Organophosphorus compound from the viscera samples of all the 54 cases.

CONCLUSION:

In current study

1. Majority of cases fall in the 41- 50 years age group in males and 21-30 years age group in females.
2. Males were more common victims.
3. Farmers were the most common occupation involved.
4. Married victims were more common.
5. Hindus were the most common religion.
6. Financial problems, health problems were the most common predisposing factors for poisoning.
7. Suicide was the most common manner of poisoning

The common causes of suicide poisoning were easy access of OP compounds, lack of employment and stressful life styles. To some extent, health education of farmers, agricultural labourers, and teenagers on the harmful and deadly effects of OP compounds will aid in preventing suicide poisoning. Mortality and morbidity can be decreased by improving the facilities and training of the personnel which provide immediate and quality management.⁶ Those with psychosocial issues need to be recognised as soon as possible and referred for psychiatric therapy.³ Stringent pesticide legislation should be made for offenders and ensuring strict vigilance over its availability.^{4,6} At household pesticides should be kept away from the reach of children and adults.⁴

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