

## Analytical study of Organophosphorus Poison in relation to age sex and marital status

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### Abstract

An Analytical study conducted on cases of organophosphorus poisoning, of which all are Positive cases declared in Forensic Science Laboratory, Hyderabad. Pesticide poisoning is a significant problem in India. Organophosphorus compounds cause most self poisoning deaths in southern and central India. Among cases preponderance of male sex over female sex.

It shows that maximum incidence of deaths from Organophosphorus poisoning are seen in 3<sup>rd</sup> decade of life followed by 4<sup>th</sup> and 5<sup>th</sup> decade for the both the sexes follow the common trend of overall suicidal deaths. Deaths from Organophosphorus poisoning are 3 times more in married group compared to unmarried group in both sexes and shows that the commonest motive for suicide from Organophosphorus poisoning is health related problems in both the sexes compared to other problems.

Chronic poisoning due to environmental pollution affecting the food chain and the community at large can be diagnosed and proper preventive and rehabilitative measure can be undertaken. All the records of the poisoning fatalities were studied in detail and statement prepared to show the frequency of individual poisons, age and sex distribution.

**Keywords:** Organo Phosphorus, Suicides, Accidental, Age and sex groups.

### Introduction

Organophosphorus compounds were first developed by Schrader shortly before and during the 2nd world war.<sup>(1)</sup> They were first used as an agricultural insecticide and later as potential chemical warfare agents. Over the last few decades Agricultural pesticides have become a common household item in rural areas of the developing world. Due to their easy availability, pesticides have also become commonly used for intentional self poisoning. Acute Pesticide poisoning is now an important cause of morbidity and mortality world-wide.

According to estimates published by world health organization in 1990 (WHO 1990) around 3 million poisoning cases with 2,20,000 death occur annually.<sup>(2)</sup> Pesticide poisoning is a significant problem in India. Organophosphorus compounds cause most self poisoning deaths in southern and central India.<sup>(3)</sup> In parts of northern India, aluminium phosphide cause most deaths stated as an epidemic that started 2 decades ago. All these pesticides are highly toxic with one hospital reporting a case fatality ratio (CFR) for aluminium phosphide of Over 90%. Other pesticides used for self-poisoning include Organo Carbamates, Organochlorines, and Pyrethroides.<sup>(4)</sup>

### Materials and Methods

A study of 62 cases of organophosphorus poisoning, of which all are Positive cases declared in Forensic Science Laboratory, Hyderabad fatalities both clinical and autopsied at the Department of Medicine and the Department of Forensic Medicine, Osmania General Hospital, Hyderabad has been made.

The records maintained at the Department of Medicine and the Department of Forensic Medicine, Osmania General Hospital includes copies of the following and Police inquest reports with circumstantial evidence includes copies of the following.

1. Hospital case sheet extracts.
2. Police requisition and inquest report.
3. Reports of clarification of the circumstances surrounding the death.
4. The postmortem reports.
5. Forensic science Laboratory reports of the chemical analysis of the viscera of the deceased.

Information was also extracted from the relatives, attenders and eyewitnesses (in some cases), regarding the mode of poisoning and the type of poison used.

The presence or absence of a poison in the viscera sent for analysis to the Forensic Science Laboratory was taken as the criteria to consider a case as a "poison fatality". This was because in some cases, if the chemical analysis report was received as negative, it was not considered for the study as the precise cause of death was not identified and at best a calculated guess would have been made.

All the records of the poisoning fatalities were studied in detail and statement prepared to show the frequency of individual poisons, age and sex distribution, the average time of survival as shown in the tables.

### Observations and Discussion

It shows preponderance of male sex (100%) over female sex. Even though both sexes are familiar with suicidal mode by pesticide poisoning the availability

easy determination feature for increase in incidence of deaths from chemical violent deaths.

The maximum incidence of deaths from Organophosphorus Poisoning are seen in 3<sup>rd</sup> decade of life followed by 4<sup>th</sup> and 5<sup>th</sup> decade for both the sexes and follow the common trend of overall suicidal deaths. Hence selection of pesticides for suicidal poisoning as no age specific relationship.<sup>(5)</sup>

Deaths from Organophosphorus poisoning are 3 times more in married group compared to unmarried group in both sexes. This again follows the general trend of suicidal deaths relative to marriage.

Pesticides are the preferred choice for ruralites compared to urbanites for commission of suicides. In the present study the ration is 4:1 for rural and urban people respectively. In rural areas the pesticides are more or less house old poison as they are used extensively in agriculture and stored in the house before being used. In urban areas the selective availability of pesticides make it a less preferred choice. More over the decision to commits suicide is a momentary one and the diseased used paraphernalia at hand rather than buying time to procure it.

Suicidal deaths from Organophosphorus poisoning are seen in all walks of life and nobody is exceptional whether rich or poor, educated or uneducated, employed or unemployed<sup>(6)</sup> etc.

The commonest motive for suicide from Organophosphorus poisoning is health related problems in both the sees and nearly 50% of cases this was cited was motive for both the sexes. However no appreciable health disaster was found in all most all the cases during autopsy and it appears as a masked motive for something also. In suicidal death where financial problems is cited as motive the diseased are exclusively males only. As male sex considered as bread earner in a family it is the sex that is subjected to stress arising from financial management. In the same way dowry harassment cited as motive for suicide is surely confined to female sex that too married only.<sup>(7)</sup>

**Table 1: Sex wise distribution of organophosphorus poisoning victims**

Sex	No. of Cases	Percentage
Male	42	67.71
Female	20	32.29
Total	62	100

**Table 2: Showing age distribution with sex**

Age in years	Male		Female		Total	
	No. of cases	Percentage	No. of Cases	Percentage	No. of Cases	Percentage
0-10	0	0	0	0	0	0
11-20	5	8.06	4	6.44	9	14.49
21-30	15	24.15	6	9.66	21	33.81
31-40	11	17.71	5	8.06	16	25.76
41-50	6	9.66	3	4.83	9	14.49
51-60	3	4.83	1	1.61	4	6.44
>60	2	3.22	1	1.61	3	4.83

**Table 3: Marital status of organophosphorus poisoning victims**

Marital Status	Male		Female		Total	
	No. of Cases	Percentage	No. of Cases	Percentage	No. of Cases	Percentage
Married	30	48.30	13	20.93	43	69.23
Unmarried	9	14.49	5	8.06	14	22.54
Not known	3	4.83	2	3.22	5	8.06

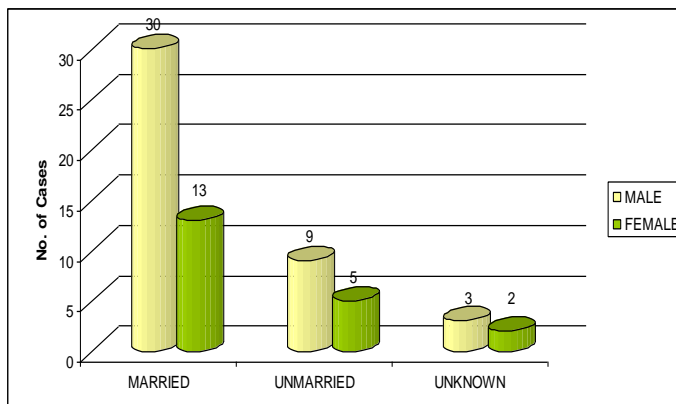


Table 4: Motive for suicide

Motive	Male		Female		Total	
	No. of Cases	Percentage	No. of Cases	Percentage	No. of Cases	Percentage
Financial troubles	19	30.59	1	1.61	20	32.22
Health problems	14	22.54	13	20.93	27	43.47
Dowry harassment	0	0	4	6.44	4	6.44
Personal relations failure	3	4.83	1	1.61	4	6.44
Educational Stress	6	9.66	1	1.61	7	11.27

Table 5: Mode of poisoning

	Suicides	Accidents	Homicides	Total
Number	61	1	0	62
Percentage	98.3	1.61	0	100

### Conclusion

Among total number of 62 cases preponderance of male sex over female sex.

It shows that maximum incidence of deaths from Organophosphorus poisoning are seen in 3<sup>rd</sup> decade of life followed by 4<sup>th</sup> and 5<sup>th</sup> decade for the both the sexes follow the common trend of overall suicidal deaths.

Deaths from Organophosphorus poisoning are 3 times more in married group compared to unmarried group in both sexes.

Shows that the commonest motive for suicide from Organophosphorus poisoning is health related problems in both the sexes compared to other problems.

Chronic poisoning due to environmental pollution affecting the food chain and the community at large can be diagnosed and proper preventive and rehabilitative measure can be undertaken.

### Suggestions

1. Punitive and stringent legislation should be made for offenders of free sellers of Scheduled E: poisons and Schedule H drugs.

2. At house hold level the drugs and poisons should be kept safely and away from reach of children and adolescents.
3. At root level of health services medical and paramedical staff should be educated and made aware of various poisonings with house hold remedial measures keeping in view of rural and illiteracy, which can reduce the mortality that is enhanced in the shifting of patients to higher level of health institutions.
4. At primary health center level it has been observed that unjustified referrals are made to secondary level health centers before making the patient fully stabilized which can result in avoidable or preventable death of the patient on way.
5. At higher institutions or tertiary level centers casualty / emergency medical officers must be trained thoroughly to deal with all kind of poisoning cases swiftly and accurately. Ready charts of different symptoms and signs should be present in emergency wards with specific antidotes. The specific antidotes and other life saving drugs should be readily available at all levels of health institutions.
6. Forensic Science Laboratories should be equipped with chemical analyzers, which can report both

quantitatively as well as qualitatively to supports the tertiary and higher referral centers.

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