
Original Article

Analytical study of organophosphorus poisoning

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Abstract:

Background: Organophosphorus (OP) compounds constitute a heterogeneous category of chemicals specially designed for the control of Pests, weeds or plant diseases. The importance of pesticides in India can be understood from the fact that agriculture is a major component of the Indian economy. It contributes 22% of the nation's GDP and is the livelihood of nearly 70% of the country's workforce.

Objective: To carry out the analytical study on organophosphorous compound poisoning

Methods: This is an analytical study of suicidal deaths due to Organophosphorus poisoning in relation to age, sex and marital status. In these cases, the post-mortem examinations were conducted in the mortuary complex of the Osmania General Hospital, Hyderabad. Only the cases, where the Organophosphorus Compounds were detected by Chemical analysis of the visceral organs, by the Andhra Pradesh State Forensic Science Laboratories, Hyderabad were taken for analytical study.

Results: The maximum incidence of deaths from Organophosphorus poisoning was seen in the 3rd decade of life, followed by 4th and 5th decades. Both the sexes follow the common trend in age related suicidal deaths. Preponderance of male sex over female sex was observed. In both the sexes, the deaths due to Organophosphorus poisoning are three times more common in married group when compared to unmarried group.

Conclusion: The analysis shows that the common motives for suicide by OP poisoning are the health and the financial problems in both the sexes, compared to other problem.

Key words: Organophosphorus, Suicide, Accident, Age, Sex, Marital status

Introduction:

The Organophosphorus compounds are the most commonly associated with human toxicity, accounting for more than 80% of pesticide related hospitalization (8). Environmental protection agency estimated that 3,000 hospitalizations per year were required for insecticide poisoning in the United States, with a fatality rate of 50% in the pediatric age group and 10% in adult.^{1,2}

Poisoning is the commonest form of fatal self harm in rural areas compared to urban population and is of far greater importance than Hanging, and other physical form of self harm.^{3,4,5}

A recent national survey in Bangladesh showed that 14% of all deaths of women between 10 and 50 years of age were due to self poisoning.⁶

The potential impact on human health from exposure to pesticides is likely to be higher in countries like India due to easy availability of highly hazardous products and low risk of awareness, especially among children and women. Having cheap and easily available highly hazardous pesticides at hand increases the incidence of intentional pesticide poisoning.⁷

Methods:

Analytical study of 62 cases of confirmed deaths due to Organophosphorus poisoning, was carried out for the present study. The following records were examined in detail for the present study:

1. Hospital case records, from the Osmania General Hospital, in cases where the victim died under treatment.
2. Police Inquest Reports.
3. Circumstantial evidences, documented in the CD files of the Police Stations, with the permission of Station House Officer.
4. The Post-Mortem Examination Reports.
5. Chemical Analysis Reports, received from the A. P. State Forensic science Laboratories.
6. Information from the relatives, friends and attendants of the deceased persons regarding the mental status of the deceased prior to death, the mode of poisoning, the type of poison used, etc.

The suspected cases of deaths due to Organophosphorus Compound Poisoning, where Organophosphorus compounds were not detected on Chemical Analysis done by the A. P. State Forensic Science Laboratories, were not included in the present study.

The records of the poisoning fatalities were studied in detail and a statement was prepared to show the frequency of poisoning in relation to the age and sex distribution, and the average time of survival as shown in the tables.

Results & Discussion:

It shows the preponderance of male sex over female sex. The maximum incidence of deaths from Organophosphorus Poisoning is seen in the 3rd decade of life followed by 4th and 5th decades. In relation to the age, both the sexes follow the common trend. Hence selection of pesticides for suicidal poisoning has no age specific relationship.⁸

Deaths from Organophosphorus poisoning are 3 times more in married group, when compared to unmarried group in both sexes. Pesticides are the preferred choice for rural areas, compared to urban areas for commission of suicides. In the present study the rural and urban ratio is 4:1. In rural areas the pesticides are more or less house old poisons as they are used extensively in agriculture; and are commonly stored in the house before being used. In urban areas the selective availability of pesticides makes it a less preferred choice.

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.⁹

The commonest motive for suicide from Organophosphorus poisoning is the health related problems, in both the sexes;

and in nearly 50% of cases this was cited as the motive. However no appreciable health disaster was found in all most all the cases during autopsy; and it appears as a masked motive for something hidden. In suicidal deaths, where financial problems are cited as motive, the diseased are exclusively males only. As male sex considered as bread earner in a family it is this sex that is subjected to stress arising from financial management. In the same way dowry harassment is cited as the motive for majority cases of suicides in females.¹⁰

Conclusion:

The analysis shows that the common motives for suicide by OP poisoning are the health and the financial problems in both the sexes, compared to other problem

Suggestions:

1. Punitive and stringent legislation should be made for offenders, who sale these poisonous substances in violation 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 the root level of health services, both the medical and paramedical staff should be educated and be made aware of various house hold poisonings with remedial measures.
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, the casualty / emergency medical officers must be trained to deal with all kinds 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 to provide the chemical analysis reports, both quantitative and qualitative, without delay, to assist the treating doctors

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Figure 1: Marital status of organophosphorus poisoning victims

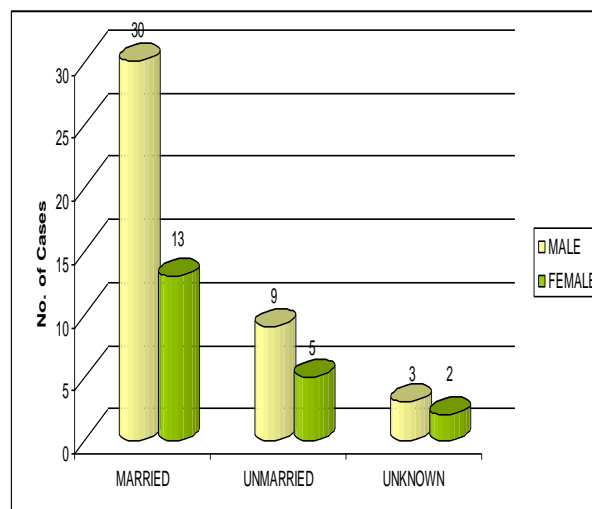


Table 1: Sex wise distribution of organophosphorus poisoning victims

Sex	Number	%
Male	42	67.7
Female	20	32.3
Total	62	100

Table 2: Showing age distribution with sex

Age (years)	Male		Female		Total	
	Number	%	Number	%	Number	%
0-10	0	0	0	0	0	0
11-20	5	8.1	4	6.4	9	14.5
21-30	15	24.2	6	9.7	21	33.8
31-40	11	17.7	5	8.1	16	25.8
41-50	3	4.8	1	1.6	4	6.4
51-60	3	4.8	1	1.6	4	6.4
> 60	2	3.2	1	1.6	3	4.8

Table 3: Marital status of organophosphorus poisoning victims

Marital status	Male		Female		Total	
	No.	%	Number	%	Number	%
Married	30	48.3	13	20.9	43	69.2
Unmarried	9	14.5	5	8.1	14	22.5
Not known	3	4.8	2	3.2	5	8.1

Table 4: Motive for suicide

Motive for suicide	Male		Female		Total	
	Number	%	Number	%	Number	%
Financial problems	19	30.6	1	1.6	20	32.2
Health problems	14	22.5	13	20.9	27	43.5
Dowry harassment	0	0	4	6.4	4	6.4
Personal relations failure	3	4.8	1	1.6	4	6.4
Education stress	6	9.6	1	1.6	7	11.3

Table 5: Mode of poisoning

Mode of poisoning	Number	%
Suicides	61	98.3
Accidents	1	1.6
Homicides	0	0
Total	62	100

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