

Sociodemographic Profile of the Organophosphorus Poisoning Cases in Southern India

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ABSTRACT

Aim: The aim of this study was to analyze the patterns, the social factors and the clinical outcomes of Organophosphorus poisoning in north Karnataka region.

Materials and Methods: All the OP poisoning cases who were admitted to the emergency department of S.N. Medical College and Hanagal Shree Kumareswar Hospital and Research Center, Bagalkot, during the period of one year from Jan 1st to Dec 31st 2010 were studied.

Results: 148 cases of OP poisoning were studied out of a total of 232 poison cases. In the present study, 52.8% cases were females and a majority of the cases were from the urban areas (56.75%). Females were more in both the married and unmarried

categories, with the highest number of cases in the age group of 21 to 30 years (46.62%). The commonest motive was suicide (95.94%). The mean time interval for the hospital admission was 4.27 hours, with a mean hospital stay of 5.17 days. Winter was commonest season for the poisoning, with 41 cases being observed in winter. The poison was consumed mainly in the afternoon (43.95%). Housewives were found in high numbers in this study (55 cases). The mortality rate was 4.72%.

Conclusion: There was a high incidence of OP poisoning with mortality in this region. The OP compounds were readily available at low costs in the market. A time of stress and frustration can lead to their use as a common poison to commit suicide with.

Key Words: Organophosphates, Poisoning, Sociodemographic

INTRODUCTION

Poisons are subtle and silent weapons which can be easily used without violence and often, without arousing suspicion. At present, due to the vast development in all the fields of life like industries, medicine and agriculture, a significant number of new compounds have appeared as new poisonous substances. Organophosphorus (OP) compounds can produce significant pesticide related illnesses and death in developing countries, including India.

Acute OP poisoning is a medical emergency and the patients are invariably admitted to the hospital through emergency services. The poisoning may be suicidal, accidental or homicidal. Accidental organophosphate poisoning may occur through inhalation while spraying pesticides on crops. We have reported a case of inhalational OP poisoning which required ventilator support. (This paper was presented at the Karnataka Medico Legal Society, 18th State Conference, FORENSICON – 2010). Because the OP compounds are readily available and relatively cheap and have a rapidly lethal action even in smaller doses, they are widely used as suicidal poisons [1].

The insecticides which have been developed to protect crops are now themselves causing significant morbidity and mortality by means of environmental pollution and suicidal use. Although extensive data is available regarding the pattern of OP poisoning in India, there is only little information regarding the victim profiles and the factors which influence mortality in southern India. The present study aimed to analyze the patterns, the social factors and the clinical outcomes of OP poisoning in this region.

MATERIALS AND METHODS

This study reviewed all the acute OP poisoning cases who were admitted to the S.N. Medical College and the H.S.K. Hospital and Research Center, Bagalkot, in north Karnataka, a region of

Southern India, during one year period from Jan 1st, 2010 to Dec 31st, 2010. A total of 148 cases of OP poisoning were studied. The diagnosis of the poison which was consumed was based on reliable information from the victim, his/her relatives and friends and also from the police. Examination of the container from which the poison had been consumed and the clinical findings were also noted. A few cases were confirmed by a postmortem examination. In a selected few cases, the serum pseudo cholinesterase levels were evaluated to confirm the diagnosis and to aid in the management of the patients. Confirmation of the nature of the poison was obtained from the viscera analysis in the postmortem cases.

RESULTS

Out of a total of 232 cases of poisoning, 148 cases (63.8%) were of OP poisoning, 65 (43.92%) were males and 83 (52.08 %) were females, with a male to female ratio of 1:1.27.

Most of the cases were from the urban areas (84 cases -56.75%) and they were distributed equally among the educated and the illiterate people (50% each).

The total percentage of the married cases was 67% and females were more in both the married and unmarried categories.

The highest number of cases (46.62%) was from the age group of 21 to 30 years and housewives topped the list was reported incidence of 55 cases (37.16%).

The OP poisoning occurred mainly during the later part of the day (43.92%) and was almost evenly distributed in all the seasons, with the highest number of cases occurring in winter (41 cases).

The commonest route of poisoning was oral in the suicidal cases and there were 6 accidental poison cases with 3 cases of inhalational OP poisoning, in which one required ventilator support.

Category	No. of Cases	Percentage
Sex		
Male	65	43.92
Female	83	56.08
Domicile		
Rural	64	43.24
Urban	84	56.75
Literacy Status		
Educated	74	50
Illiterate	74	50

[Table/Fig-1]: Incidence of sex, Literacy status and domiciliary pattern of cases

Status	Male	%	Female	%	Total	%
Married	44	67	56	67	100	67
Unmarried	21	33	27	33	48	33
Total	65	100	83	100	148	100

[Table/Fig-2]: Marital Status of Cases

Age Group (in years)	No. of Cases	Percentage
0-10	03	02.02
11-20	31	20.94
21-30	69	46.62
31-40	31	20.94
41-50	08	05.40
51-60	04	02.70
Above 60	02	01.35
Total	148	100

[Table/Fig-3]: Age wise Distribution

Occupation	No. of Cases	Percentage
Student	22	14.86
Farmer	27	18.24
Housewife	55	37.76
Business man	01	00.67
Govt. Servant	01	00.67
Others	42	28.37

[Table/Fig-4]: Occupation of Poisoning Cases

Time of Consumption	No. of Cases	Percentage
6 am to 12 noon	39	26.36
12 noon to 6 pm	65	43.92
6 pm to 12 mid night	37	25.00
12 mid night to 6 am	07	04.72
Seasonal Variation		
Summer (Mar, Apr, May)	29	19.60
Rainy (Jun, Jul, Aug)	40	27.00
Spring (Sept, Oct, Nov)	38	25.70
Winter(Dec, Jan, Feb)	41	27.70

[Table/Fig-5]: Timing of poisoning

The time which elapsed between the poison intake and the start of the treatment, varied from 30 minutes to one day and a majority of the cases reached the hospital within 3 to 6 hours (37.16%), with a mean time interval of 4.27 hours. The mean hospital stay was 5.17 days, with a majority of the cases staying for 3 to 7 days in the hospital (73.64%).

The mortality in the present study was 4.72% (seven cases), with nine patients (6.08%) being on the ventilator for respiratory paralysis.

DISCUSSION

OP Poisoning is common in India, as ours is an agriculturally based society and as the OP compounds are easily available at a cheap rate. Organophosphates are the commonest class of pesticides which have been implicated in cases of poisoning (in the present study, it was 63.8%) [2],[3].

The present study had more number of OP cases from the urban areas as compared to other studies, because now a days these compounds are easily available in the urban areas. This hospital catered to an urban population and so there were more urban cases. Even we could think of changing trends in the urban population.

The present study had an equal number of educated and illiterate cases and this could be explained on the basis that the more number of urban cases led to the more number of educated cases in this study.

A majority of the victims were in the age group of 21-30 years (in the present study, it was 46.62%), which is similar to that in other studies [4], [5], [6], [7], [8]. This age group was the most active one, physically, mentally and socially and so, it was more prone to stress during life. The three cases which were seen under the age of 10 in this study were accidental.

Most of the studies from India [3],[8],[9],[10],[11] and from other countries [4],[5],[12],[13],[14],[15] showed that suicide (in the present study, it was 95.94%) was the commonest reason for the non-accidental poisoning.

Time Lapse in Hours	No. of Cases	Percentage
Up to one hour	14	9.45
1 to 3 hours	52	35.13
3 to 6 hours	55	37.16
6 to 12 hours	25	16.89
12 to 24 hours	01	00.67
One day	01	00.67
Unknown	00	00
Hospitalization in days		
Up to one day	11	7.43
1 to 3 days	12	8.10
3 to 7 days	109	73.64
7 to 15 days	14	9.45
15 to 30 days	02	1.35
30 days	00	00

[Table/Fig-6]: Survival Patterns

	Present Study %	Dash et al [3] 2005 %	Dash et al [8] 2008 %
Sex			
Male	43.92	53	67
Female	56.08	46	23
Domicile			
Rural	43.24	58	82
Urban	56.75	42	18
Literacy			
Educated	50	83	-
Illiterate	50	16	-

[Table/Fig-7]: Comparison of sex, domiciliary pattern and literacy status

The reasons for the suicide in males may include lack of employment, poverty, urbanization and various other stress related factors. In females, it may be due to marital disharmony.

Both unmarried and married females were mostly affected in the present study, which was in contrast to the findings of other studies [4],[8] where unmarried males were more affected. This could be explained by the fact that this study included more urban, unmarried females who were students. Our study correlated well with Sahin et al's study [5].

In India, when a woman gets married, she has to leave her home and join an entirely new family with different traditions, rituals and customs. [8] In southern part of India, the husband's family was the first place where a woman faced violence and ill treatment [10], which correlated with the findings of our study, where out of 83 females, 55 were house wives [8], [16].

In the present study, the victims who were more prone to the OP poisoning were housewives, farmers and students, which correlated with the findings of other studies [11]. But one interesting fact in this study was that other than the occupation which was

Marital Status	Present Study %	Dash et al [3] 2005 %	Dash et al [8] 2008 %	Gupta et al [11] %
Married	67	51	48	58
Unmarried	33	49	52	42

[Table/Fig-8]: Comparison of marital status

Time of Consumption	Present Study %	Dash et al [8] 2008 %
6 am to 12 noon	26	28
12 noon to 6 pm	44	37
6 pm to 12 mid night	25	21
12 mid night to 6 am	05	11
Seasonal Variation		
Summer (Mar, Apr, May)	20	38
Rainy (Jun, Jul, Aug)	27	19
Spring (Sept, Oct, Nov)	25	26
Winter(Dec, Jan, Feb)	28	17

[Table/Fig-9]: Comparison of time of consumption

Time Lapse in Hours	Present Study %	Dash et al [8] 2008 %
Up to one hour	9.45	7.10
1 to 3 hours	35.13	45.00
3 to 6 hours	37.16	21.00
6 to 12 hours	16.89	10.00
12 to 24 hours	0.67	8.60
One day	0.67	1.40
Unknown	00	5.60
Hospitalization in days		
Up to one day	7.43	32.00
1 to 3 days	8.10	7.10
3 to 7 days	73.64	28.60
7 to 15 days	9.45	22.80
15 to 30 days	1.35	1.40
30 days	00	1.40

[Table/Fig-10]: Survival Pattern Comparison

specified, there were 42 cases from other occupational categories, which depicted the changing trend in the urban population in this region, that OP poisoning was the commonest way for suicide for the public at large from all the categories of life.

In this study, a majority of the cases consumed OP during the afternoon i.e. 12 noon to 6 pm (44%), which correlated well with the findings of other studies [2],[8],[13]. Season-wise, here the cases were distributed equally in all seasons, with winter topping the list. This could be explained on the basis of the more number of urban cases in this study and the changing trends here. In other studies, the commonest season was summer.

The time interval between the intake of the poison and the attendance by a doctor was 4.27 hours, which was the same in other studies [5],[8].

The hospitalization time varied between 15 min to 30 days, with a mean hospitalization time of 5.17 days, which was similar to that which was found in other studies [4],[5],[8].

The mortality rate in the present study was 4.72%, which correlated with that in other [5],[17],[18] studies. The mortality rate directly depended on the time at which the patient received the treatment and in one study it was 47% [8], because in that study, the treatment was given late.

CONCLUSION

It is obvious that the younger generation has become the victims of OP poisoning, with the number of cases increasing every year. It is essential to strengthen the legislature on the availability of the OP compounds and it is also more essential to strengthen the preventive measures like educating people through drug awareness programmes, promoting poison information centers, introducing separate toxicological units in hospitals and upgrading the peripheral health centers to manage the cases of OP poisoning in an emergency. So, to conclude, it is important to design an appropriate health education programme for the prevention of both suicidal and accidental OP poisoning for the benefit of the public at large.

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