

Socio-demographic Profile of the Causes of Death due to Organophosphorus Poisoning - A Retrospective Study

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Abstract

Background: Poisoning is a global issue occurring all over the world involving people of all ages and genders, from all ethnic and economic groups. It is estimated, there are 1 to 5 million cases of Organophosphorus poisoning per year worldwide with approximately 300,000 deaths.

Aim of the study: To assess the demographic pattern of death due to organophosphorus poisoning with respect to age, sex, occupation, education, and socioeconomic status.

Materials and Methods: A retrospective study was conducted by the Department of Forensic Medicine & Toxicology, Sheikh Hasina Medical College, Tangail, from January 2020 to December 2020.

Result and discussion: 85 (20.68%) were due to poisoning, out of those poisoning cases 77 (90.58%) were due to organophosphorus compound poisoning. The incidence was higher in females (51.94%) than in males. 90.00% of the victims in our study were married females, and 63.64% of cases were below Secondary education, Among the male deaths 83.78% were from rural areas, and female rural deaths were 82.50%. Housewife (38.9%) were the major victims.

Conclusion: Illiteracy, Poverty, Cheap availability of organophosphorus compounds, lack of employment, and stressful lifestyle were the common reasons behind suicidal poisoning. Health education of farmers, other agricultural laborers and young people about the toxic and detrimental effects of organophosphorus compounds will help in preventing suicidal and accidental poisoning to some extent.

Key Words:

Organophosphorus Poisoning

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Introduction

Poisoning is defined as the exposure of an individual to a substance that can cause symptoms and signs of organ dysfunction leading to injury or death. Death due to organophosphorus poisoning is an important public health issue. This is a global problem with maximum cases reported from developing countries like Bangladesh.

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Agricultural Pesticide poisoning is a global problem with at least 250,000-370,000 People getting affected each year¹.

Bangladesh is an agricultural country there is widespread use of pesticides because of their easy availability. Pesticides are now the common method of suicide worldwide². Organophosphorus compound accounts for about 80% of pesticide-related hospital admissions³. The case of fatality of organophosphorus poisoning is 5-20% in developing countries in Asia.⁴

According to the World Health Organization (WHO), the incidence of pesticide poisoning is estimated between 1 and 5 million victims with 300,000 lethal cases annually (World Health Organization and Food and Agriculture Organization of the United Nations, 2006). Organophosphates affect the nervous system by disrupting the coenzyme that regulates acetylcholine, a neurotransmitter. Most organophosphates are insecticides as they were developed during the early 19th century, but their effects on insects, which are similar to their effects on humans, were discovered in 1932. Some are very poisonous.

The objective of the present study was: To investigate the socio-demographic profile of the causes of death due to organophosphorus poisoning examined at autopsy in a tertiary care hospital morgue.

Materials and Method

This retrospective autopsy survey was conducted by the Department of Forensic Medicine, Sheikh Hasina Medical College, Tangail from January 2020 to December 2020. All autopsies were performed in the Department. Eighty-five (20.68%) were attributed to lethal intoxication. Among them, seventy-seven (90.58%) were resulted from organophosphate poisoning. The age group was 14 years to 70 years. Male 37 (48.05%) and Female 40 (51.94%), history of poisoning, manner of death, and type of exposure were recorded from autopsy findings in standard formats; meticulous autopsy findings of all the cases were noted. The clinical analysis reports of the viscera were also scrutinized to confirm the diagnosis of organophosphorus poisoning.

This study was approved by the ethics committee of Sheikh Hasina Medical College, Tangail.

Result

Between January 2020 to December 2020, 411 autopsies were conducted. During the study period 85 (20.68%) were due to poisoning, out of those poisoning cases 77 (90.58%) were due to organophosphorus compound poisoning. The age group of 14-70 years was most commonly involved. 48.05% of victims were male, while 51.94% were Female (Fig-1)

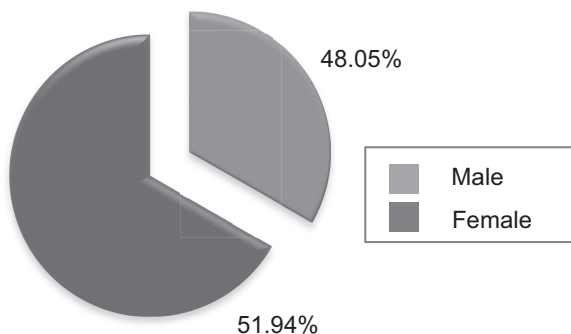


Fig-1: Gender distribution among the victims

It was found in the present study that organophosphorus poisoning constituted 90.58% of all unnatural deaths (77 out of 85)

As per distribution for age out of 77 organophosphorus poisoning cases (n-77), 37 (48.05%) were male and 40 (51.94%) were female in the age 14-70 yrs.

As per the distribution of marital status, males 89.18% and females 90.00% and according to educational status, out

of 77; 49 (63.64%) were below secondary education and 28 (36.36%) had completed secondary school education. Graduates the incidence is less.

As per distribution of occupational status out of 77 organophosphorus poisonings; housewives 30 (38.96%), Unemployed 10 (12.98%), Businessmen 13 (16.88%), students 12 (15.58%) service holders 4 (5.19%); Farmer 8(10.38%).

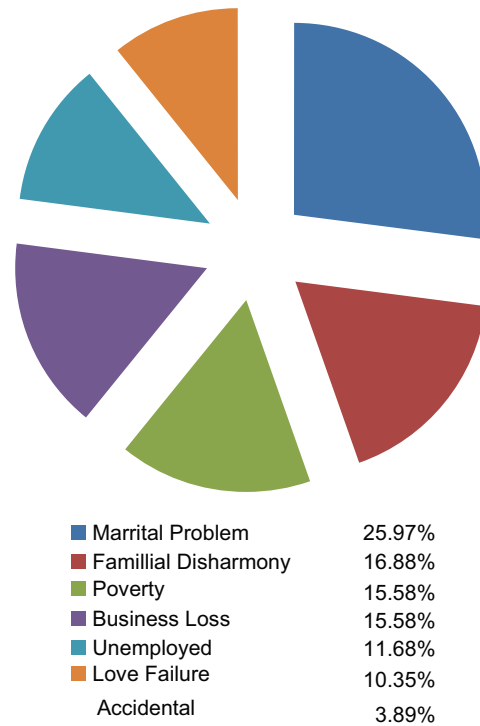


Fig-2: Distribution of causes of death

As per distribution of causes of death due to organophosphorus poisoning; Marital disharmony 20 (25.97%), Familial dispute 13 (16.88%), poverty 12 (15.58%), Business loss 12 (15.58%), Unemployed 9 (11.68%), Love affairs 8 (10.38%), Accidental 3 (3.89%). (Fig-2)

Discussions

In the present investigation of total 411 unnatural deaths autopsied during the study period 85 cases were due to poisoning (20.68%), and out of those poisoning cases 77 were due to organophosphorus amounting to 90.58% of poisoning deaths.

In the present study, organophosphorus poisoning deaths were higher at 51.94% in females than in male deaths 48.05%. Among the male deaths, 83.78% from rural & 16.21% were from urban areas. Among the female deaths, rural deaths were about 82.50% & urban deaths were 17.50%. An increased farming activity like spraying of pesticides contributed to a maximum number of poisoning cases in all areas.

In this study, married male 89.18% and female married were 90.00% deaths due to organophosphorus poisoning.

Illiteracy or less education or below secondary 63.60%. Less availability of immediate treatment may be the cause of such poisoning death.

In this study deaths due to organophosphorus poisoning in occupational distribution.

Table-I

Occupation	Number of deaths due to organophosphorus	Percentage
Housewife	30	38.96%
Unemployment	10	12.98%
Business loss	13	16.88%
Service holder	04	5.19%
Student	12	15.58%
Farmer	8	10.38%

In the present study higher incidence of death due to organophosphorus poisoning was found in marital problems 25.97% and familial disharmony 16.88% group victims, poverty 15.58%, love failure 10.35% and accidental 3.89% could be explained as major causes of suicidal poisoning.

Organophosphorus compounds were the most commonly used poisons because of their wide use in agriculture. Thus, results of the present study were consistent with the previous studies, except for some differences in the kinds of poisons preferred (5, 6, and 7).

The common autopsy findings were cyanosis in the lips, the fingertips and the nose. All the internal organs were congested in 100% of cases.

Dissection revealed congestion of time mucous membrane of the stomach with scattered submucosal petechial hemorrhages.

Conclusion

Illiteracy, Poverty, Cheap and easy availability of the organophosphorus compounds lack of employment and stressful lifestyle were the common reasons behind suicidal poisoning. Health education of farmers and young people about the toxic detrimental effects of organophosphorus compounds will help prevent suicidal and accidental poisoning to some extent.

This study shows that a large proportion of pesticide poisoning deaths are preventable. Prevention is, on the one side by restricting the availability of pesticides and on the other side by promulgating more vigorous legislation concerning the manufacturing marketing and use of these products.

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