

A Study on Sociodemographic Factors among the Organophosphorous Poisoning Individuals

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Conflict of interest: Nil

Abstract:

Introduction: Organophosphorus compounds (OPCs) as poisoning substance contribute significant deaths in developing nations. A study was taken to find the correlation between various demographic factors and organ phosphorus poisoning (OPP) individuals.

Methods: It was a prospective research conducted in the department of general Medicine, Prathima Institute of Medical sciences, Nagunoor. Study protocol was approved by the Institutional Ethics committee. An informed written consent was taken from the participants. Consent was taken from the immediate blood relative if the individual cant submit the consent. Individuals of both gender aged > 18 years, those admitted due to OPP were included in this research. Non cooperative individuals, those taken atropine treatment were not considered in this research. After recruiting the individual in the research, if possible the study was explained to the immediate blood relatives. Physical examination was carried and findings were recorded in the study proforma. In addition the sociodemographic parameters such as age, gender educational background, occupation and so on were recorded in the study proforma. P value < 0.05 was considered statistically significant.

Results: Total 60 (100%) members were included in this study; majority (50%; 30) were in 21 – 30 years. Gender wise, 60% (36) were males and the male female ratio was 1.5. Living area wise 62% (37) were rural population and statistically there was significant difference.

Conclusion: Self-poisoning using OPC constitutes a significant public health issue in many rural areas across Asia. It was common among the male those are around 30 years.

Keywords: Organophosphorus, Poisoning, Study, Research.

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Introduction

Suicidal and intentional self-harm represent significant public health challenges, particularly in middle- and low-income nations (LMINs). [1] Reports on suicide in less affluent countries suggest impulsive decision-making, with the choice of self-harm methods often influenced by availability rather than lethality. Additionally, individuals engaging in suicidal behavior may lack significant psychopathology. Despite the well-documented cases of organophosphate poisoning among farmers, there remains a lack of comprehensive information on most pesticide poisonings and the socioenvironmental factors influencing their prevalence. [2]

Organophosphorus compounds (OPCs) find widespread use as pesticides, not only in agricultural and horticultural settings but also within households for managing vector-borne

diseases like malaria and dengue. These compounds contribute to approximately 200,000 deaths caused by pesticide poisoning in developing nations [3]. OPCs act as irreversible inhibitors of cholinesterase enzymes, including both cholinesterase and pseudocholinesterase (butyrylcholinesterase). These enzymes play a crucial role in breaking down acetylcholine, a neurotransmitter, into choline and acetic acid. [4] With this a study was taken to find the correlation between various demographic factors and organ phosphorus poisoning (OPP) individuals.

Methods

It was a prospective research conducted in the department of general Medicine, Prathima Institute of Medical sciences, Nagunoor. Study protocol was approved by the Institutional Ethics committee. An

informed written consent was taken from the participants. Consent was taken from the immediate blood relative if the individual cant submit the consent. Individuals of both gender aged > 18 years, those admitted due to OPP were included in this research. Non cooperative individuals, those taken atropine treatment were not considered in this research. The confidentiality was also maintained and the study team assured that names were not disclosed.

After recruiting the individual in the research, if possible the study was explained to the immediate blood relatives. Physical examination was carried and findings were recorded in the study proforma. In addition the sociodemographic parameters such as age, gender educational background, occupation and so on were recorded in the study proforma. If

required, blood sample was collected following the universal safety precautions. [5]

Statistical Analysis: The data was analysed using SPSS software version 17. Statistics such as mean, Standard deviation, ANOVA and t test were used. P value < 0.05 was considered statistically significant.

Results

Total 60 (100%) members were included in this study; majority (50%; 30) were in 21 – 30 years followed by 31 – 40 (20%; 12), <20 years (15%; 9) and 51 – 60 years (1.7%; 1). Gender wise, 60% (36) were males and the male female ratio was 1.5. Living area wise 62% (37) were rural population and statistically there was significant difference (Table 1).

Table 1: Gender wise distribution of study participants as per the area of living; n (%)

| Area | Male | Female | Total |
|----------------------|---|---------|----------|
| Rural | 29 (48) | 8 (13) | 37 (62) |
| Urban | 7 (12) | 16 (27) | 23 (38) |
| Total | 36 (60) | 24 (40) | 60 (100) |
| Statistical analysis | χ^2 value = 13.584; P value = 0.000228 | | |
| | Statistically significant | | |

Discussion

As per the World Health Organization (WHO) in 2012, around 3 million cases of OPP occur annually, stemming from both unintentional and intentional exposures. This leads to an estimated 300,000 deaths each year. [6] Various studies, including the National Poison Information Centre in India, have indicated that suicidal poisoning involving household agents like organophosphorous (OPs), carbamates, pyrethrinoids, etc., is prevalent. The affordability, high toxicity, ability to be ingested with food or drink, and easy accessibility make these substances the most common means of poisoning. [7] A part of study proforma, the study members or the blood relations were asked for the name the chemical consumed but they were not able to reveal the name.

Most of the study members in this research were 21 – 30 (50%) years. According to Selvaraj et al. [8] the age group of 21 – 40 years accounted for 67% of poisoning cases. Research conducted by Kar SM et al. [9] demonstrated that the highest incidence of poisoning occurs in the young age group. Younger individuals tend to be more impulsive and ambitious, often belonging to the working class with increased responsibilities. Consequently, during this life stage, they are particularly susceptible to various emotional conflicts.

In the current study, gender wise 60% were male and the male female ratio was 1.5. Goel et al. [10] Gannur DG et al. [11] observed a similar male

preponderance in their studies. Conversely, studies conducted by Dubey TN et al. (52%) [12] and Chaudhary R et al. (70.2%) [13] reported predominance of cases among females. The sociodemographic analysis indicates a higher likelihood of pesticide poisoning among males compared to females. This pattern is attributed to external exposure for males, particularly laborers working in the fields in agricultural communities. In contrast, females experience pesticide poisoning within the home, as they often manage household responsibilities while being exposed to mass media, including films and television series that may portray morbid suicide thoughts [14]. This research was also from a tertiary health care setup where low socioeconomic category people attend to this and majority were daily labourers.

Self-poisoning with OPC pesticides is a major public health problem across most rural Asia. [15] Living area wise, in this research, 62% (37) were rural population and statistically there was significant difference (Table 1). Arora BS [8] reported that >50% of their study participants were from rural area. Similar view was opined by Batra AK et al. [16] Socioeconomic status was not analysed in this study, which is limitation of the current research.

Conclusion

Self-poisoning using OPC constitutes a significant public health issue in many rural areas across Asia. It was common among the male those are around 30 years.

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