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Research Article

**DEMOGRAPHICAL AND CLINICAL PROFILE OF PATIENTS  
WITH ACUTE ORGANOPHOSPHORUS POISONING****Dr. Aisha Khalid <sup>1\*</sup>, Prof. Dr Mohammad Akbar Kazi <sup>1</sup>, Dr. Ishrat Bibi <sup>1</sup>,  
Dr. Hamid Nawaz Ali Memon <sup>2</sup>, Dr. Mehrab khan <sup>3</sup>, Dr. Imran Karim <sup>3</sup>, Dr. Samreen <sup>4</sup> and  
Dr. Zulfiqar Ali Qutrio Baloch <sup>5</sup>**<sup>1</sup>Department of Forensic Medicine & Toxicology, L.U.M.H.S Jamshoro<sup>2</sup> Zulekha Hospital Dubai United Arab Emirates<sup>3</sup> Liaquat University Hospital Hyderabad / Sindh Pakistan<sup>4</sup>National Institute of Cardiovascular Diseases (NICVD) Karachi<sup>5</sup> Brandon Regional Hospital Brandon, Florida, U.S.A**Abstract:**

**Objective:** To evaluate the demographical and clinical profile of patients with acute organophosphorus poisoning at tertiary care hospital.

**Patient and Methods:** The one year cross sectional study was conducted on patients with organophosphorus poisoning and beside immediate management the patients were explored for demographical and clinical survey by taken detail history and clinical examination. The data was saved and analyzed in SPSS 21 while the frequencies and percentages and mean  $\pm$  SD were calculated.

**Results:** Total one hundred patients were recruited and studied for demographical and clinical profile with mean age  $\pm$ SD 22.82  $\pm$  1.16 mostly from rural areas (77%). Majority of them belonged to low economic status and 69% and the precipitating problems identified were financial (36%), domestic (11%) and social (9%). Majority of cases were detected during winter (50%) and spring (39%) in morning (49%) and night (29%) as suicidal (86%) and route was infestation (100%) whereas the tachycardia (100%), elevated body temperature (82%), peri orbital dryness (74%) and conjunctival injection (56%) were the common systemic findings observed in patients with OP poisoning.

**Conclusion:** The acute and chronic poisoning by pesticides is a serious health problem; therefore, medical and health professionals should be aware and learn about the toxicology, prevention and proper management of OP poisoning.

**Key Words:** Organophosphorus poisoning, toxicology and Insecticide

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**INTRODUCTION:**

Most of the Asian countries heavily rely on agricultural as major sector of their economy. In countries such as Pakistan, India and Bangladesh, China and East Asian countries agricultural labour constitutes nearly 75% of the total work force which works in conditions without effective safety measures. These agricultural farmers frequently use pesticides to protect their crops as at least one third of their crops is claimed to be destroyed by pests [1-2]. Use of pesticides greatly increase crop yields which otherwise might not support their livelihood. Furthermore, insect-borne diseases are also easily eliminated or controlled with these insecticides which also pose a great danger to their crops. Currently Organic phosphates (OPs) are the most commonly used chemicals as the pesticides. These pesticides are also modified according to their toxicity as nerve agents for their use in warfare as were used in Iraq-Iran conflict [3]. Apart from that the self-poisoning by ingestion of OP, many suicidal cases are also reported in the third world countries making it as one of the major clinical problems in the region. World Health Organization (WHO) has reported more than 3 million such cases in their recently published report with more than 350,000 deaths every year [4-5]. 99% of these deaths are reported in Asia with half of these in China (5). No study is conducted yet showing the impact of mixed therapy of atropine and glycopyrrolate in comparison to the therapy with atropine alone in Pakistan. In this study patients of moderate OP poisoning only with nausea, vomiting, lacrimation, salivation and miosis have been considered while the patients having above systems along with apneic spells, seizures and coma are categorized as severe cases of OP poisoning and have been excluded from the study. It is hypothesized that the combined glycopyrrolate and atropine use will show more positive and less complicated results as compared to use of atropine alone in OP poisoned patients.

To evaluate the demographical and clinical manifestations of organophosphate poisoning at tertiary care hospital

**PATIENTS AND METHODS:**

The cross sectional study of one year was conducted at tertiary care hospital on the patients with OP poisoning. The inclusion criteria of the study were the patients with >18 years of age, either gender presented with OP poisoning were recruited and enrolled in the study whereas other than the OP poisoning was considered in exclusion criteria. After taking the consent either from patients or next to kin the complete relevant history was taken and specific physical examination was performed. Meanwhile the patients were managed on immediate basis and accordingly while the detailed proforma was filled in for the purpose of recording history, data, and detail of treatment given to organo-phosphorus poisoning cases and statistical data was analyzed on SPSS version 21. Data was statically evaluated by using frequencies and percentages and the mean  $\pm$ SD.

**RESULTS:**

During one year study period total one hundred patients with OP poisoning were studied with mean age  $\pm$ SD was  $22.82 \pm 1.019$  with male gender predominance. The demographical and clinical manifestations were evaluated. Table 1 shown the gender, educational, background, social-economic status, participating problem and the area of their work in total patients selected for the study and shown statistical evaluation of the season and time of day of poisoning, manner and route of exposure for all patients (n = 100). Table 2 shown the table shows the blood pressure (systolic and diastolic), pulse rate, body temperature and respiratory rate in all patients (n=100). At The time of entry, the mean tympanic temperature, pulse rate, respiratory rate and blood pressure (systolic and diastolic) of the OP poisoned patients were  $36.8 \pm 0.1271$  (36.0- 39.5),  $66.32 \pm 2.88$  (55-73),  $17.92 \pm 1.147$  (14-22),  $113.70 \pm 5.502$  mm Hg (105-144) and  $73.80 \pm 4.88$  mm Hg (67-92) while the Table 3 shown the clinical symptoms observed in patients with OP poisoning.

TABLE 1: DEMOGRAPHICAL DISTRIBUTION OF POPULATION

<b>Gender</b>	<b>n=100</b>
Male	57 (57%)
Female	43 (43%)
<b>Education</b>	
No education	06 (6%)
to matriculation	58 (58%)
Above matriculation	36 (36%)
<b>Socio-economic status</b>	
Low socioeconomic	59 (59%)
Lower middle class	39 (39%)
Upper middle class	02 (2%)
<b>Precipitating problems</b>	
Financial	36 (36%)
Domestic	11 (11%)
Social	09 (9%)
Others	44 (44%)
<b>Address</b>	
Urban	23(23%)
Rural	77(77%)
<b>Season:</b>	
Winter	50 (50%)
Spring	39 (39%)
Summer	11 (11%)
Autumn	00 (0%)
<b>Time:</b>	
Morning	49 (49%)
Evening	24 (24%)
Night	27 (27%)
<b>Manner</b>	
Suicidal	86 (86%)
Accidental	14 (14%)
<b>Route of Exposure</b>	
Infestation	100 (100%)

**TALE 2: MEAN ± SD FOR QUANTITATIVE VARIABLES OF THE STUDY POPULATION**

Parameter	Mean ±SD
Age	22.82±1.019
BP upper limb	114.0±0.756
BP lower limb	74.20±0.750
Pulse	66.38±0.428
Temperature	37.15±0.428
Respiratory rate	18.36±0.252

**TABLE 3: CLINICAL PROFILE OF THE STUDY POPULATION**

Systemic manifestation	Frequency n =100 (%)
Conjunctival injection	28 (56%)
Peri-orbital dry	37 (74%)
Tachycardia	50(100%)
Tachypena	01 (2%)
Elevated body temperate	41 (82%)
CNS stimulation	14 (28%)
Confusion	02 (4%)
Psychotic	01 (2%)
Reactions	00 (0%)
Delirium	00 (0%)
Seizures	00 (0%)

**DISCUSSION:**

Pakistan is basically an agro based country and agriculture is the backbone of economy. Being an agriculture-based economy crop protection is one of the important aspects of lives of workforce involved in agricultural sector. [6] The crop protection agents include OP pesticide which used for the purposes. The organophosphates which are basically toxic to human health and farmers are likely to be exposed to them resulting in adverse effects; farmers are accidentally over exposed while handling these pesticides. Secondly, because of low cost and easy availability in the houses of farmers, the OPs have become common substances for suicidal attempts [7]. After exposure to OP, intense cholinergic symptoms i.e. Salivation, lacrimation, Urination, Defecation, Gastric cramps, Emesis (SLUDGE) are commonly seen. These symptoms occur acutely within minutes to hours but some patients can develop delayed effects after initial symptoms or without initial clinical features [8]. It is not an easy task to manage an OP poisoned patient which requires intensive care unit and use of atropine and Oxime cholinesterase reactivators [9]. Key to survival lies in early diagnosis followed by rapid decontamination together with effective therapy under the expert domain of emergency medicine. To understand the health manifestations associated with pesticide exposures it is essential to have knowledge of different scientific fields like toxicology, physiology, pharmacology,

epidemiology, and sociological studies [9, 10]. There are four clinical syndromes that affect the patient with OP poisoning for example the cholinergic crisis, intermediate syndrome, delayed neuropathy and chronic organophosphate induced neuropsychiatric disorder [11, 12]. Nicotinic effects such as fasciculation's, muscle weakness, tachycardia and hypertension are motor and sympathetic manifestations. One recent retrospective study on OP poisoning revealed that muscarinic sign and symptoms were the most frequent (84%) followed by the affecting CNS (78%) and nicotinic effects (17%) [14].

Various studies have shown that OP poisoning is also associated with chronic symptoms like respiratory depression, memory disorders, dermatologic conditions, cancer, depression, neurologic deficits, miscarriages, and birth defects (14-16). Recent review by Van Maele-Febry [17] has put light on the association between pesticide exposure and cancer. The Non-Hodgkin lymphoma (NHL) has a clear association with OP poisoning (126). Another review has reported that broad range of nonspecific symptoms, including headache, dizziness, fatigue, weakness, nausea, chest tightness, difficulty in breathing and Insomnia occurs in pesticide poisoning [18].

**CONCLUSION:**

In agricultural countries of Asia OP pesticides are used in over the past many decades for crop protection. In these countries the acute and chronic poisoning by pesticides is a serious health problem. OP pesticides through fruits and vegetables can affect the human health later on. Therefore, medical and health professionals should be aware and learn about the toxicology, prevention and proper management of OP poisoning.

**REFERENCES:**

1. Gunnell D, Eddleston M, Phillips MR, Konradsen F. The global distribution of fatal pesticide self-poisoning: systematic review. *BMC Public Health*. 2007;7:357.
2. Bertolote JM, Fleischmann A, Butchart A, Besbelli N. Suicide, suicide attempts and pesticides: a major hidden public health problem. *Bull World Health Organ*. 2006;84:260
3. Balali-Mood M, Shariat M. Treatment of organophosphate poisoning. Experience of nerve agents and acute pesticide poisoning on the effects of oximes. *J Physiol Paris* 1998;92:375–378
4. Wesseling C, McConnell R, Partanen T, et al. Agricultural pesticide use in developing countries: health effects and research needs. *Int J Health Serv* 1997;27:273–308
5. Delgado E, McConnell R, Miranda J, et al. Central nervous system effects of acute organophosphate poisoning in a 2-year follow-up. *Scand J Work Environ Health* 2004;30:362–370.
6. Senanayake N, Karalliedde L. Neurotoxic effects of organophosphorus insecticides. An intermediate syndrome. *N Engl J Med*. 1987;316:761–763.
7. Namba T. Cholinesterase inhibition by organophosphorus compounds and its clinical effects. *Bull World Health Organ*. 1971;44:289–307.
8. Wadia RS, Sadagopan C, Amin RB, Sardesai HV. Neurological manifestations of organophosphorous

insecticide poisoning. *J Neurol Neurosurg Psychiatry*. 1974;37:841–7.

9. Bardin PG, Van Eeden SF. Organophosphate poisoning: grading the severity and comparing treatment between atropine and glycopyrrolate. *Crit Care Med*. 1990;18:956–960.

10. Konradsen F, van der Hoek W, Peiris P. Reaching for the bottle of pesticide—a cry for help. Self-inflicted poisonings in Sri Lanka. *Soc Sci Med* 2006;62:1710–1719.

11. Ecobichon DJ. 1996. Toxic effects of pesticides. In: Casarett and Doull's *Toxicology: The Basic Science of Poisons* (Klaassen CD, Doull J, eds). 5th ed. New York: MacMillan, 643–689.

12. Lee P, Tai DY. Clinical features of patients with acute organophosphate poisoning requiring intensive care. *Intensive Care Med*. 2001;27:694–9

13. Arcury TA, Quandt SA, Mellen BG. An exploratory analysis of occupational skin disease among Latino migrant and seasonal farmworkers in North Carolina. *J Agric Saf Health*. 2003;9(3):221–32

14. Alavanja MC, Hoppin JA, Kamel F. Health effects of chronic pesticide exposure: cancer and neurotoxicity. *Annu Rev Public Health*. 2004;25:155–197.

15. Das R, Steege A, Baron S, Beckman J, Harrison R. Pesticide-related illness among migrant farm workers in the United States. *Int J Occup Environ Health*. 2001;7:303–312

16. Engel LS, O'Meara ES, Schwartz SM. Maternal occupation in agriculture and risk of limb defects in Washington State, 1980–1993. *Scand J Work Environ Health*. 2000;26(3):193–198

17. Van Maele-Fabry G, Willems JL. Occupation related pesticide exposure and cancer of the prostate: a meta-analysis. *Occup Environ Med*. 2003;60(9):634–642.

18. Kamel F, Hoppin JA. Association of pesticide exposure with neurologic dysfunction and disease. *Environ Health Perspect*. 2004;112:950–958.