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Clinical Profile and Outcome of Patients with Organophosphorus Poisoning Admitted at Pravara Rural Hospital, Loni (Bk): A Prospective Study

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Abstract

Background: Organophosphorus poisoning is a significant health burden worldwide, developing countries and especially so in India. Management of organophosphorus poisoning needs multidisciplinary approach includes emergency medical care and support services for victims and care givers or family. The present study was planned to carry out with objective of assessing clinical profile and outcome of patients with organophosphorus poisoning. *Material and Methods:* A descriptive study with cross sectional survey approach was conducted among 30 patients with organophosphorus poisoning admitted at Pravara Rural Hospital, Loni (Bk). The patients who are 18 years or older were selected with purposive sampling method. A pre tested structured proforma was used to collect the data by observation method. The collected data was tabulated and analyzed using appropriate statistical methods wherever required. *Results:* The results revealed that majority of organophosphorus poisoning patients were males and source of poisoning was agriculture work related. A significant number of patients had wide range of health problems like respiratory distress, nausea, vomiting, increased salivation, abdominal pain, diarrhea, excessive sweating, altered level of consciousness, altered emotional status, altered in motor system and changes in reflexes etc wherein they were managed with comprehensive health care, and shown good recovery. *Conclusion:* This study demonstrated that the organophosphorus poisoning was common among young adults with male predominance, and patients had variety of physical and psychological health problems, and managed to have good recovery.

Keywords: Clinical Profile; Outcome; Patients with Organophosphorus Poison.

Introduction

Any substance that impairs health or destroys life when ingested, inhaled or absorbed by the body in relatively small or large in amounts is known as poisons [1]. Poisons are substances that cause disturbances to organisms due to chemical reaction, when a sufficient quantity is absorbed via epithelial lining such as skin or gut by an organism [2].

Organophosphorus compounds have been widely used for a few decades in agriculture for crop protection and pest control; more than hundred of them have been marketed for these purposes. Many deaths are due to consumption of organophosphorus pesticides and occur in the young and economically active age group [3]. World Health Organization estimates acute pesticide poisonings at three million cases worldwide per year, out of which one million were accidental and two million were suicidal [4].

It was estimated in India the 5 to 6 persons per lakhs population die due to poisoning every year. The commonest cause of poisoning in India is organophosphorus compounds, and common reasons behind this are due to agricultural based economy, poverty and easy availability of highly toxic poisons, and occupational, accidental poisoning while in adults the reason was mainly suicidal. Mortality rate varies from place to place depending on the nature of poison, availability of facilities and treatment by qualified persons [5].

Organophosphorus poisoning is a medical emergency and if treated in the early hour's patient's condition can be reversed. When appropriate treatment is given within a couple of hours when the type of poisoning is notified patient life can be saved. Since the respiratory failure is a major reason for mortality, careful monitoring, appropriate management, early recognition of complication and comprehensive nursing care may decrease the mortality rate among organophosphorus poisoning patient [6].

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Organophosphorus poisoning patients usually presented with variety of health problems on various systems, which needs to be managed with the team of qualified health personnel. Nurses play an imperative role in recognizing the problem, followed by planning of care and carry out prescribed treatment and supportive care. For providing inclusive nursing care nurses needs better understanding on clinical picture, prognosis and outcome of organophosphorus poisoning patients, thus the present study was carried out to assess the clinical profile and outcome of patients with organophosphorus poisoning admitted at Pravara Rural Hospital, Loni (Bk), Maharashtra.

Material and Methods

A non experimental, descriptive cross sectional study was carried out on organophosphorus poisoning patients at Pravara Rural Hospital, Loni (Bk), Maharashtra. Thirty patients were selected using purposive sampling technique, based on criteria's of selection. Organophosphorus poisoning patients who were 18 years old or older and willing to participate were included, whereas the patients who brought in dead were excluded from study. An ethical approval was obtained from Institutional Ethics Committee (IEC) of Pravara Institute of Medical Sciences (Deemed to be University), Loni (Bk). The purpose of study was explained to patients/caregiver, and written informed consent was sought before enrolling them.

The tool used for data collection was structured proforma which consists of three sections such as: *Section A* – socio demographic characteristics like age, gender, marital status, education, occupation and religion; and clinical characteristics like number of days of hospital stay, source of organophosphorus poison, history of previous consumption, co morbid illness, type of organophosphorus poison, quantity of compound ingested, time gap between intake and first aid started or hospitalization, and mode of transportation *Section B* – Clinical profile of patients and *Section C* – outcome of patients with organophosphorus poisoning. After the collection of baseline data, patients were examined clinically and the information was recorded on the pre tested proforma on daily basis from the day of admission up to the day of discharge of patient, wherein the outcome was assessed on the day of discharge. The collected data was tabulated and analyzed using appropriate statistical methods wherever required.

Results

Results related to socio demographic data: More than one third (37%) of organophosphorus poisoning patients under study were 24 to 33 years of age, more than half (54%) of them were male and majority (87%) were married. Higher percent (40%) followed by (30%) had primary and secondary education respectively. Significant proportion i.e. (30%) of patients were farmers and among females (33%) were home makers.

Results related to clinical characteristics: Majority (60%) of organophosphorus poisoning patients had source of poisoning via agricultural based followed by one third (33%) had suicidal attempt, highest percent (57%) had 'Dimethioat' compound of organophosphorus poisoning. Significant

Table 1: Clinical profile and outcome of organophosphorus poisoning patients

N=30

A	Clinical profile	Frequency	Percent
1	Vomiting	30	100%
2	Pupils constricted, not reacting to light	23	77%
3	Increased salivation	20	67%
4	Confusion to coma	20	67%
5	Fasciculation	20	67%
6	Hostility	18	60%
7	Excessive sweating	16	53%
8	Hypotension	13	43%
9	Respiratory distress	08	27%
10	Diminished swallowing reflex	07	23%
B	**Investigative profile**		
1	Low serum cholinesterase	23	77%
2	Low packed cell volume (PCV)	18	60%
3	Leucocytosis	13	43%
4	Thrombocytopenia	06	20%
C	**Management**		
1	Gastric Lavage	30	100%
2	Atropine	30	100%
3	Protopam (PAM)	30	100%
4	Antibiotics	30	100%
5	Antacids	30	100%
6	Antiemetic	30	100%
7	Hydration therapy (RL, DNS, D5%, NS0.9%)	30	100%
8	Ryle's tube feeding	28	97%
9	Chemical restraints	15	50%
10	Physical restraints	14	47%
11	Ventilator support	07	23%
D	**Outcome**		
1	Good recovery	28	93%
2	Death	02	07%

proportion (40%) had ingested 40 – 80 ml of contents followed by (30%) ingested 80 – 100 ml, and importantly (40%) of patients had brought to hospital within 2 hours of ingestion. Majority (57%) had received first aid services, higher percent (43%) of patients brought to hospital from home while (27%) of them referred from private hospitals. Greater part (60%) of patients was brought with help of ambulance and remaining had brought through two wheelers. Considerable percent (43%) of them were had hospital stay more than 10 days while (37%) had 7 – 9 days hospital stay.

Results related to clinical profile and outcome of organophosphorus poisoning patients: All the organophosphorus poisoning patients under study had vomiting, followed by majority of them had changes in pupil reaction, increased salivation, confusion to coma state, fasciculation, hostility, excessive sweating etc. In relation to investigative profile majority had low serum cholinesterase it might be due to anti cholinesterase effect of organophosphorus poisoning followed by significant proportion had low PCV and increased WBC's. Further the organophosphorus poisoning patients were treated with gastric lavage, antidotes, hydration therapy, antibiotics, antacids, antiemetics, RT feeding and significant number of patients had mechanical ventilator support and restraints. Irrespective of age, gender majority of patients had good recovery and only two patients were died.

Discussion

It was noticed from study findings that adults were commonly affected with organophosphorus poisoning. This finding was consistent with study conducted by Chintale KN who also noted that maximum patients (66%) of organophosphorus poisoning are seen in the age group of 21 to 40 years [7]. Similarly more than half of patients under study were male; it was congruence with results of Raddi D, Anikethana GV that organophosphorus poisoning observed more in male as compared to female [8]. One third of patients under study were home makers, and (30%) of them were had agriculture as a prime occupation. This was in resemblance with results of Selvaraj T, Sudharson S that occupation was recorded to be agricultural among study participants [9].

Majority of patients had source of poisoning was agricultural related followed by significant percent consumed organophosphorus poison for suicidal attempt reason. It was consistent with the study conducted by Shah UK, Jain HK, Singh A who noted that most patient's mode of exposure was suicidal ingestion (93%) and accidental inhalation (7%) [10]. In our study significant proportion of patients ingested more than 50 ml of organophosphorus poisoning compounds. It was comparable with the findings of Shakuntala and Yogesh G study that half of patients had consumed 50 to 100 ml of poisonous compounds [11].

It was evident that noteworthy number of patients had been received treatment within two hours of ingestion of organophosphorus poison. Poisoning is a medical emergency where the emergency medical service is mandatory within the golden hours, wherein it was reliable with the study results of Chintale KN, Patne SV, Chavan SS that most of patients under study who received treatment within 1 to 4 hours of consumption of poisonous substance [12]. Interestingly majority of patients were given first aid by trained persons with sodium chloride wash. It was coincidental with the study performed by Kapila P, Sekhon HS, Mishra VK who noted that most of patients were admitted to hospital could get first aid treatment [13].

It is notable that significant number of patients with organophosphorus poisoning had respiratory distress, vomiting, increased salivation, pupil changes, excessive sweating, changes in emotional status, level of consciousness, and low serum cholinesterase. These observations were also similarly noticed in studies conducted by Peter JV, Sudarsan TI and Moran JL [14]; Shah NM, Mundhra SH [15]; Singh B, Unnikrishnan M [16]; and Somasundaram KV, Ashok Patil E, Shuklas K [17] and it was well supported.

All (100%) organophosphorus poisoning patients had gastric lavage, use of antidotes antibiotics, antacids, antiemetics, analgesics and intravenous fluids (use of mechanical ventilation in severe cases) as a line of treatment, and had good recovery. It was well documented from the studies of Osinaike BB, Oranusi IO, Akinyemi OA, Sanusi AA [18] and Shakuntala, Yogesh G [19] who also observed a similar kind of line of treatment strategy and treatment outcomes.

Conclusion

The findings of study have shown that organophosphorus poisoning were common among young adult with male predominance. The agriculture related source and Dimethioat was the common type of poisoning. The considerable number of patients had respiratory distress,

vomiting, increased salivation, excessive sweating, altered in level of consciousness, altered emotional state, and changes in the reflexes. It was evident from the results that most of patients under study had good recovery as the patients were treated with comprehensive medical and nursing interventions. This study envisages the complete spectrum of organophosphorus poisoning patients.

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References

1. Peter JV, Moran JL, Graham P. Oxime therapy and outcomes in human organophosphate poisoning: an evaluation using meta-analytic techniques. Crit Care Med, 2006;34(2):502–10.
2. Rahimi R, Nikfar S, Abdollahi M. Increased morbidity and mortality in acute human organophosphate poisoned patients treated by oximes: A Meta analysis of clinical trials. Hum Exp Toxicol, 2006;25(3):157–62.
3. Jokanovic M, Prostran M. Pyridinium oximes as cholinesterase reactivators. Structure activity relationship and efficacy in the treatment of poisoning with organophosphorus compounds. Curr Med Chem, 2009;16(17):2177–88.
4. Aygun D. Diagnosis in an acute organophosphate poisoning: report of three interesting cases and review of the literature. J Emerg Med, 2004;11(1): 55–58.
5. Krupesh N, Chandrasekar TR. Organophosphorus poisoning still a challenging proposition. Indian Journal of Anesthesia, 2008;115(5):40.
6. Ngowi AV. Assessment and prevention of adverse health effect of pesticides. Journal of Medical Environment, 2008;4(3):344–56.
7. Chintale KN, Patne SV, Chavan SS. Clinical profile of organophosphorus poisoning patients at rural tertiary health care centre. International Journal of Advances in Medicine, 2016;3(2):268–74.
8. Raddi D, Anikethana G V. Clinical profile of organophosphorus poisoning in a tertiary care hospital. Indian Journal of Basic and Applied Medical Research, 2017;4(1):14–22.
9. Selvaraj T, Sudharson S. Demographic and Clinical Profile of Organophosphorus Poisoning cases in a Medical College Hospital, Tamil Nadu. Indian Journal of Forensic and Community Medicine, 2016;3(2):124–27.
10. Shah UK, Jain HK, Singh A. Clinical profile of organophosphate compound poisoning in a tertiary care centre. International Journal of Multidisciplinary Research and Development, 2015; 2(3):40–43.
11. Shakuntala and Yogesh G. Analysis of organophosphosporus poisoning at tertiary care hospital. Journal of Evidence Based Medicine and Health Care, 2015;2(4):421–430.
12. Chintale KN, Patne SV, Chavan SS. Clinical Profile of Organophosphorus Poisoning patients at rural tertiary health care center. International Journal of Advances in Medicine, 2016;2(3):46–52.
13. Kapila P, Sekhon HS, Mishra VK. Study of poisoning deaths in and around Shimla (HP). IIJFMT, 2003;1 (2):85–92.
14. Patel DJ, Tekade PR. Profile of Organophosphorus Poisoning at Maharani Hospital, Jagdalpur, Chhattisgarh: A Three Years Study. Journal Indian Acad Forensic Med, 2011;33(2):52–60.
15. Shah NM, Mundhra SH. Clinical profile of organophosphate poisoning at a tertiary-care center. International Journal of Medical Science and Public Health, 2016;5(8):41–50.
16. Singh B, Unnikrishnan M. A profile of acute poisoning at Mangalore (south India). J Clin Forensic Med, 2006;13(3):112–16.
17. Somasundaram KV, Ashokpatil, Shuklas K. Epidemiological profile of OP poisoning cases treated at Pravara Rural Hospital, Loni, India. Indian J Prev Soc Med, 2009;40(3):185–89.
18. Osinaike BB, Oranusi IO, Akinyemi OA, Sanusi A. A clinical profile of Organophosphate Poisoned Patient: A Test of Critical Care Services in Nigeria. The Annals of African Medicine, 2013;10(3):50–56.
19. Shakuntala, Yogesh G. Analysis of Organophosphorus Poisoning at tertiary care Hospital: A Report. Journal of Evidence based Medicine and Healthcare, 2015;2(4):421–430.