

A Clinical and Biochemical Profile of Organophosphorus Poisoning in Intensive care unit of a Private Hospital

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ABSTRACT

INTRODUCTION: Organophosphorus pesticide self-poisoning is a major clinical and public-health problem across much of rural Asia. Poisoning has been a common cause of medical admissions. Hospital-based studies from five major hospitals across the country in 1999- 2000 showed OP compounds were the most common form of poisoning comprising 52% of total cases. This study was done to study profile of patients admitted in a private hospital.

METHODS: This is an observational study done for the period of one year from September 2011 to September 2012 carried out in Anamol Hospital and Research Centre. Patients were received in department of emergency and after initial management of gastric lavage and atropinization needed patients are transferred to ICU or wards. As per proforma data were collected and were entered in MS Excel and SPSS and analyzed.

RESULT: Analyzing the data A total of 29 patients were admitted during the study period out of which 9 patient died, patient who had high random blood sugar more than 140mg/dl, requiring atropine more than 15 mg for atropinization and patients needing ventilator were likely to die despite treatment. However low cholinesterase did not have any effect on mortality.

CONCLUSION: Organophosphorus compound poisoning is one of the major problems in the developing world. Initial assessment and adequate support is key to successful outcome. Factors of poorer outcome including shown here are, patient having high random blood sugar more than 140mg/dl, requiring atropine more than 15 mg for atropinization and patients needing ventilator support death. There needs to be further study regarding associated factors contributing the outcome of patients.

KEY WORDS: Poisoning, Organophosphorus compound, mortality

INTRODUCTION

Organophosphorus pesticide self-poisoning is a major clinical and public-health problem across much of rural Asia. Of the estimated 500 000 deaths from self-harm in the region each year, about 60% are due to pesticide poisoning.¹ Poisoning has been a common cause of medical admissions and deaths in Nepalese hospitals 31% of all suicidal deaths in the country in 1999- 2000 were due to poisoning. Hospital-based studies from five major hospitals across the country in 1999- 2000

showed OP compounds were the most common form of poisoning comprising 52% of total cases. Various isolated hospital-based studies also clearly demonstrate that OP compounds occupy the greatest burden of poisoning related morbidity and mortality in Nepal.² Case fatality with Organophosphorus poisonings 15–30%. Improved medical management and provision of antidotes and intensive care beds, together with bans on the most toxic pesticides, should reduce the case fatality for self-poisoning and noticeably reduce the number of deaths from self-harm in rural Asia.³

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Seasonal variations in water availability keep these communities in financial debt, driving farmers to suicide by ingestion of agricultural pesticides that are sold directly over the counter and have inadequate regulations controlling their use and storage. Early and correct diagnosis and treatment may be life saving in OP poisoning. It is important to treat cases in hospitals with respiratory support facilities to reduce the morbidity and mortality. The diagnosis of OP Poisoning can be made by history of ingestion or exposure, clinical signs, laboratory investigations like estimation of blood cholinesterase and pseudoacetylcholinesterase and therapeutic response to atropine⁴. Treatment includes resuscitation of patients and giving oxygen, a muscarinic antagonist usually atropine, fluids, and an acetylcholinesterase reactivator - an oxime. Respiratory support is given as necessary. Gastric decontamination should be considered only after the patient has been fully resuscitated and stabilized. Patients must be carefully observed after stabilization for changes in atropine needs, worsening respiratory function because of intermediate syndrome, and recurrent cholinergic features occurring with fat-soluble organophosphorus. Few randomized trials of such poisoning have been done; consequently the evidence base is restricted. Both atropine and oximes were introduced into clinical practice rapidly in the 1950s without clinical trials. As a result, we do not know the ideal regimens for either therapy. Trials of other interventions are hindered because the best way to give the core treatments has not yet been determined and is highly variable in practice. This variability interferes with development of a widely accepted study protocol and limits the external validity of study results.⁵

METHODS

This an observational study done for the period of one year September 2011 to September 2012 carried out in Anamol Hospital and Research Centre .Patients were received in department of emergency and after initial management of gastric lavage and atropinization needed patients were transferred to ICU or wards. It also receives patient from surrounding hospitals for the ICU care. Those referred patient were usually initially managed in the respective hospitals and they are directly transferred to ICU. Initial heart rate and blood sugar and cholinesterase and atropinization dose was either noted from emergency department or from the referral letter. Remaining data was on demography and cause of poisoning were obtained from accompanying

relatives. Data was entered in MS Excel and SPSS and analysed.

RESULTS

Mean age of the presentation is 37.5 years (range 12-68yrs). Out of 29 patients 11 were male and 18 female. All of them had consumed the poison with the intention to die.

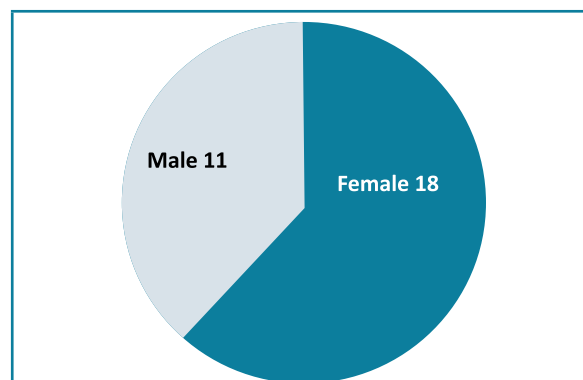


Figure 1: Sex Ratio

All of the patients or their relatives were asked about the cause of consuming the substance, 11 of them replied because of minor problem they becoming impulsive with the small misunderstanding and all of them survived and regretted the attempt for suicide. 6 of them consumed because of misunderstanding with in-laws and all of them were female. There remaining 12 of them consumed the compound for the financial reasons in this group 11 were male and 1 was female.

At presentation their mean heart rate was 62beats per minute. Mean Random blood sugar at presentation was 94 mg / dl (range 45-192 SD 28.49). Analyzing the data of death patients, patient who had high random blood sugar more than 140mg/dl is associated with increased mortality ($p=0.049$. Pearson Correlation= 0.0468).

Mean pseudocholinesterase level was 4817 Units per liter U/L).Maximum 12500 U/L and minimum level of 1150 U/L. Normal range 3000-12000 U/L. Decrease level of pseudocholinesterase is not associated with increased mortality($p=0.768$).

14 of 29 patient needed ventilator and out of total 9 death in the group all of them were the patient in ventilator. Mean atropinization dose was 18 ampoule minimum 5 ampoules to maximum 35 ampoules(Standard Deviation 12).Patients requiring

more than 15 ampoules for atropinization likely to die during treatment ($p=0.0354$).

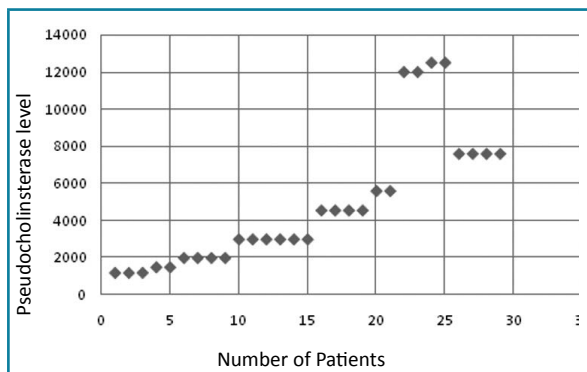


Figure 2: Pseudochoolinesterase level

DISCUSSION

OP poisoning is a serious clinical entity and causes considerable mortality. The estimated mortality following OP ingestion ranges from 20 to 50%.¹ A study done in Korea showed, the total mortality 19% (13 deaths in 68 patients), and 12 of these deaths occurred in the 35 patients with respiratory failure. In their study, age, amount ingested, APACHE II score, initial cholinesterase level, and respiratory failure requiring mechanical ventilation were significantly associated with a poor outcome. The usefulness of the serum cholinesterase level remains doubtful.² In this study there was 31% death and as shown in other studies respiratory failure was associated with poor outcome. Transient hyperglycemia and glycosuria are often found in severe organophosphate poisoning.⁵ In a study done by Shobha and Prakash Of the 105 patients with organophosphorus poisoning hyperglycemia was noticed in 7% and glycosuria in 14% of patients.³ In our study requirement of ventilator high random blood sugar and high dose for initial atropinization was associated with increased mortality. There is no correlation of poorer outcome and low serum cholinesterase level.

Most of the patient in this study took poison for Socio-economic reason and mostly is due to suicidal intention and seen in female populations, which is seen in other studies too. In most of the other studies 60% of patients in this study belonged to low socioeconomic studies.⁶ OPs are common household insecticides used extensively by agricultural communities. Seasonal variations in water availability keep these communities in financial debt, driving farmers to suicide by ingestion of agricultural pesticides that are sold directly over the counter and have inadequate regulations controlling

their use and storage.⁷ Until the regulation is made strong for the selling of Organophosphorus compound it is less likely that this problem is going to decrease.

CONCLUSION

Organophosphorus compound poisoning is one of the major problems in developing world. Initial assessment and adequate support is key to successful outcome. Factors of poorer outcome shown here are, patient having high random blood sugar more than 140mg/dl, requiring atropine more than 15 mg for atropinization and patients needing ventilator are likely to die during treatment. There needs to be further study regarding associated factors contributing the outcome of patients.

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