

Incidence of Hyperamylasemia Leading to Respiratory Failure in Patients of Organophosphate Poisoning

Hyperamylasemia with
Organophosphate
Poisoning

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ABSTRACT

Objective: To determine the frequency of Hyperamylasemia leading to respiratory failure in patients of organophosphate poisoning.

Study Design: Observational / descriptive study.

Place and Duration of Study: This study was conducted at the Department of Medicine Dow University of Health Sciences, Karachi from June 2014 to June 2015.

Materials and Methods: A total of 168 patients of Organophosphate poisoning fulfilling the inclusion criteria were included in the study. Blood was drawn after aseptic measures by a trained phlebotomist for Serum Amylase level and Arterial blood gases. Value more than 101U/L was taken as hyperamylasemia. PaO₂ less than 60mmHg or PCO₂ greater than 55mg was labeled as respiratory failure. All information was noted on proforma.

Results: There were 59% were male and 41% were female. Frequency of hyperamylasemia in patients of organophosphate poisoning was 44%. Frequency of respiratory failure in hyperamylasemia in patients was observed in 68%. Respiratory failure was significantly high in male than female (70% vs. 59%, p=0.019).

Conclusion: Hyperamylasemia is more frequently seen in organophosphate poisoning. In patients with respiratory failure the mortality is very high; therefore we recommended early diagnosis, careful monitoring and appropriate management of complications in reducing the mortality rate.

Key Words: Organophosphate, Respiratory failure, Hyperamylasemia

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INTRODUCTION

Organophosphate compounds are diverse group of chemicals widely used in domestic and industrial settings, as insecticides, herbicides & fungicide¹⁻⁴. However these compounds pose major health risks and hazards in the form of organophosphate poisoning. The problems associated with these compounds are not only affecting the developing world but are also common in the developed world¹.

The following facts and figures about organophosphate poisoning stand out¹ it accounts for approximately 3 million poisoning cases around the globe² it is the cause of around 200,000 deaths every year³ majority of such cases are largely populated in the Asian-Pacific region⁴

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It is projected that nearly 90 percent of such poisoning cases are suicidal with fatality rate of greater than 10 percent⁵ 8 to 10 percent are accidental while less than 1 percent are estimated as homicide cases^{6,7}.

The widespread use of organophosphates as a household and agricultural pesticide without regulation, is probably the most important reason for organophosphate poisoning. This reflects the necessity of early diagnosis, treatment and the implementation of advanced supportive care in ICU^{8,9,10}.

Elevated amylase levels or Hyperamylasemia is frequently seen in organophosphate poisoning due to cholinergic stimulation of pancreas⁴. Studies conducted by Singh et al and Lee et al reported 37 patients out of 79 and 44 patients out of 121 with hyperamylasemia in patients with organophosphate poisoning respectively^{11,12}.

Furthermore, respiratory failure is one of the serious complications associated with such poisoning.¹³

MATERIALS AND METHODS

This study was carried out at the Department of Medicine Dow University of Health Sciences, Karachi from June 2014 to June 2015.

Sample Selection:

Inclusion criteria:

- Age ≥ 15yrs to ≤ 45yrs of both genders

- Diagnosed case of organophosphate poisoning presenting in 24hours of ingestion

Exclusion criteria:

- History of ingestion of any other material along with organophosphate poisoning
- Subjects with H/O of alcohol addiction
- Patients with acute abdomen
- Who had gone thru ERCP in previous 24hrs
- Concomitant respiratory illness

Data Collection Procedure: Data was collected on a pretest self administered Performa after taking permission from ethical committee of the hospital. Blood was drawn after aseptic measures by a trained phlebotomist for Serum Amylase level and Arterial blood gases.

Data Analysis Procedure: Data was analyzed with the help of SPSS program version 18. Frequency and percentages were calculated for gender, hyperamylasemia and respiratory failure. Stratification was done with regards to age, gender, duration of ingestion.

RESULTS

One sixty eight diagnosed case of organophosphate poisoning presenting in 24hours of ingestion were included in this study. Age distribution of the patients is presented in figure 1. The average age of the patients was 36.87 ± 7.54 years (table 1).

Out of 168 cases, 99(59%) were male and 69(41%) were female. Duration of ingestion of the most of the cases were 6 to 12 hours as presented in figure 2. Frequency of hyperamylasemia in patients of organophosphate poisoning was 44%. Frequency of hyperamylasemia was not significant among the groups (table 2). Similarly rate of hyperamylasemia was not significant between gender and in patients with <6 hours and 6 to 12 hours duration of ingestion as presented in table 3 and 4.

Frequency of respiratory failure in hyperamylasemia in patients of organophosphate poisoning was observed in 68% (50/74). Frequency of respiratory failure was not significant in age groups while respiratory failure was significantly high in male than female (70% vs. 30%; $p=0.019$) as shown in table 8. Frequency of respiratory failure in hyperamylasemia was also not significant with <6 hours and 6 to 12 hours duration of ingestion patients as presented in Table 5.

Table No.1: Descriptive Statistics of Patients

Variables	Mean \pm SD	95%CI	Max-Min	Range
Age (Years)	36.87 \pm 7.54	35.52 to 38.21	45-15	30
Duration of Ingestion (hours)	7.68 \pm 2.46	6.12 to 8.74	12-1	11

Table No.2: Hyperamylasemia in Patients of Organophosphate Poisoning with Respect to Age Groups

Age Groups	Hyperamylasemia		P-Values
	Yes n=74	No n=94	
15-20 yrs	10(13.5%)	25(26.6%)	0.144
21-30 yrs	22(29.7%)	23(24.5%)	
31-40 yrs	30(40.5%)	28(29.8%)	
40-45 yrs	12(16.2%)	18(19.1%)	

Chi-Square= 5.146

Table No.3: Hyperamylasemia in patients with respect to gender (n=168)

Gender	Hyperamylasemia		P-Values
	Yes n=74	No n=94	
Male	45(60.8%)	54(57.4%)	0.66
Female	29(39.2%)	40(42.6%)	

Chi-Square= 0.194

Table No.4: Hyperamylasemia in patients with respect to duration of ingestion (n=168)

Duration of Ingestion	Hyperamylasemia		P-Values
	Yes n=74	No n=94	
< 6 hours	23(31.1%)	40(42.6%)	0.127
6 to 12 hours	51(69.9%)	54(57.4%)	

Chi-Square= 2.325

Table No.5: Respiratory failure in hyperamylasemia in patients of organophosphate poisoning with respect to duration of ingestion (n= 74)

Duration of Ingestion	Hyperamylasemia		P-Values
	Yes - n=50	No - n=24	
< 6 hours	15(30%)	8(33.3%)	0.77
6 to 12 hrs	35(70%)	16(66.7%)	

Chi-Square= 0.084

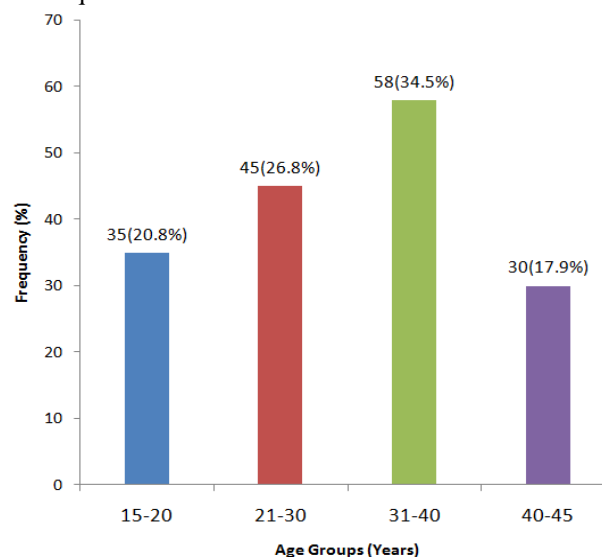


Figure No.1: Bar graphing showing age distribution of the patients n=168

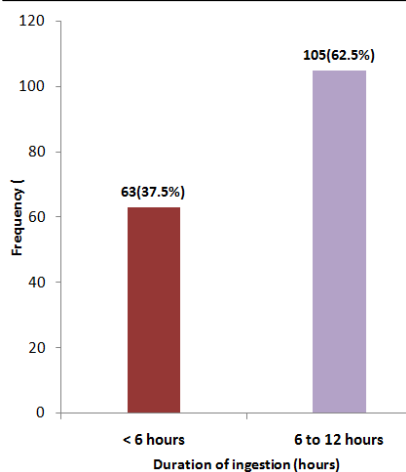


Figure No.2: Duration of ingestion of the patients n=168

DISCUSSION

In Pakistan, the prevalence of depression is high and suicidal tendencies are increasing¹⁴. Insecticide intake as a suicidal attempt has been seen very often in our society and in other developing countries as it is readily available in every home^{8,15,16}.

Ingestion of Organophosphates for suicidal purposes is a major problem, especially in developing countries. Ops (organophosphates) not only affect Acetylcholinesterase but also may alter the liver, kidney, pancreas and the other organ functions¹⁷.

In our study Frequency of hyperamylasemia in patients of organophosphate poisoning was 44% (74/168). Martin Rubi et al¹⁸ have reported only three patients with pancreatitis in a total number of 506 cases of organophosphate intoxication. The findings of hyperamylasemia was closely related to clinical severity and presence of shock. This makes a percentage of 5.66%. Sahina and others^{19,20} have reported acute pancreatitis in 6 patients among 47 making a percentage of 12.7%.

Dagli and Shaikh²¹ reported transient elevated amylase in 47 of 75 patients with malathion poisoning and three of their patients had hyperglycemia. Different scoring systems have been used to grade severity of poisoning^{22,23}.

In present study frequency of respiratory failure in hyperamylasemia in patients of organophosphate poisoning was observed in 68%. Frequency of respiratory failure was not significant in age groups while respiratory failure was significantly high in male than female (70% vs. 30%; p0.019). In Eddleston et al study²⁴ ninety of 376 patients (24%) required intubation, 52 (58%) within 2 hrs of admission while unconscious with cholinergic features. Twenty-nine (32%) were well on admission but then required intubation after 24 hrs while conscious and without cholinergic features.

Harputluoglu and Edleston have reported to acute pancreatitis on admission after an attempted suicide by the ingestion of excessive organophosphate in human. In these reports, leukocyte count and serum amylase levels were very high measured when compared to reference range^{24,25}.

CONCLUSION

Organophosphate compounds poisoning is a serious and lethal condition and needs early diagnosis and appropriate treatment. Hyper amylasemia is more frequently seen in organophosphate poisoning. In patients with respiratory failure the mortality is very high; therefore we recommended early diagnosis, careful monitoring and appropriate management of complications in reducing the mortality rate.

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Philips SM. Predicting the need for ventilatory support in organophosphate compound poisoning. Karnataka, Bangalore: Rajiv Gandhi University of Health Sciences; 2006.
2. Thung S, Sam K G, Khera K, Pandey S, Sagar SV. Evaluation of incidence, clinical characteristics and management in organophosphorus poisoning patients in a tertiary care hospital. J Toxicol Environmental Health Sci 2010;2:73-6.
3. Agarwal SB. A clinical, biochemical, neurobehavioural, and psychological study of 190 patients admitted to hospital as a result of acute organophosphate poisoning. Environ Res 1993;62: 63-70.
4. Ahmed A, Begum I, Aquil N, Atif S, Hussain T, Vohra EA. Hyperamylasemia and acute pancreatitis following organophosphate poisoning. Pak J Med Sci 2009;25:957-61.
5. Davies JOJ, M Eddleston, and Buckley NA. Predicting outcome in organophosphate poisoning with a poison severity score or the glasgow coma scale QJ Med 2008;101:371-79.
6. Karalliedde L. Medical Toxicology Unit, Guy's and St Thomas' Hospitals, UKoxicoology Unit. Anesthesia 1999;54:1073-88.
7. Moore M, James OF. Acute pancreatitis induced by organophosphate poisoning. Postgrad Med J 1981;57:660-62.
8. Farooqui AN, Tariq S, Asad F, Abid F, Tariq O. Epidemiological profile of suicidal poisoning at Abbasi Shaheed Hospital Kar. Med Dent Coll 2004;9:502-7.
9. Abbas S, Riaz MN, Akram S. Organophosphate poisoning. Emergency management in intensive care unit. Prof Med J 2003;10:308-14.

10. Ather NA, Jamal Ara, Khan EA, Abdul Sattar R, Durrani R. Acute organophosphate insecticide poisoning. *J Sug Pak* 2008;13:71-74.
11. Singh S, Bhardwaj U, Verma SK, Bhalla A, Gill A. Hyperamylasemia and acute pancreatitis following anticholinesterase poisoning. *Hum Exp Toxicol* 2007; 21: 467-72.
12. Lee WC, Yang CC, Deng JF, WU ML, GER J, Lin HC, et al. The clinical significance of hyperamylasemia in organophosphate poisoning. *J Toxicol Clin Toxicol* 1998;36: 673-81.
13. Sangur M, Guven M. Intensive care management of organophosphate insecticide poisoning. *Critical Care* 2008; 5: 211-15.
14. Ahmed Z, Ahmed A, Mubeen SM. An Audit of suicide in Karachi from 1995-2001. *Ann Abbasi Shaheed Hosp Kar Med Dent Coll* 2003;8:424-8.
15. Nadesan K. Pattern of suicide. A review of autopsies at the university hospital, Kuala Lumpur. *Malays J Pathol* 1999; 21: 95-9.
16. Birt C, Brahe BU, Cabecadas M, Chisti P. Suicide Mortality in European union. *Eur J Pub Heal* 2003; 13:108-114
17. Yurumez Y, Ikizceli I, Sozuer EM, Soyuer I, Yavuz Y, Avsarogulları L, et al. Effect of interleukin-10 on tissue damage caused by organophosphate poisoning. *Basic Clin Pharmacol Toxicol* 2007;100: 323-27.
18. Martin JC Yelamos RF, Laynez BF. Poisoning caused by organophosphate insecticides. Study of 506 cases. *Rev Clin Exp* 1996;196:145-49.
19. Sahin I, Onbasi K, Sahin H, Karakaya C, Ustun Y, Noyan T. The prevalence of pancreatitis in organophosphate poisoning. *Hum Exp Toxicol* 2002;21: 175-7.
19. Krupesh N, Chandrashekar TR, Ashok AC. Organophosphate poisoning – Still a challenging proposition. *Ind J Anaesth* 2002; 46: 40-3.
20. Dagli AJ, Shaikh WA. Pancreatic involvement in malathionanticholinesterase insecticide intoxication: A study of 75 cases. *Br J Clin Pract* 1983;37: 270-72.
21. Weizman Z, Sofar S. Acute pancreatitis in children with anticholinesterase insecticide intoxication. *Pediatrics* 1992;90:204-6.
22. Sungurtekin H, Gurses E, Balci C. Evaluation of several clinical scoring tools in organophosphate poisoned patients. *Clin Toxicol* 2006;44: 121-26
23. Eddleston M, Monmed F, Davies JOJ, Eyer P, Worek F, et al. Respiratory Failure in Acute Organophosphorus Pesticide Self-Poisoning. *QJM*. 2006; 99: 513-22.
24. Hacıoğlu M, Kantarceken B, Karıncaoğlu M, Aladağ M, Yıldız R, Ateş M, et al. Acute pancreatitis: an obscure complication of organophosphate intoxication. *Hum Exp Toxicol* 2003; 22: 341-43.

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Rifled Fire-Arm: The Predominant Weapon in All Medico-Legal Deaths in Lahore

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ABSTRACT

Objective: The main objective of Medico-legal autopsy is to find out the cause of death but it also helps in finding the manner of death. From this we also find out the criminal behavior of the society and usage of different kinds of weapons related with the cause of death and particularly the types of fire-arm weapons which is more in concern with the present study. This study was especially conducted to find out the predominance of rifled fire-arms weapons amongst all fire-arm deaths.

Study Design: Observational / descriptive study.

Place and Duration of Study: This study was conducted at the Department of Forensic medicine & Toxicology K.E.M.U. Lahore during the period of 2006-2008.

Materials and Methods: This study includes 2979 medico-legal autopsies. The information was gathered from post-mortem reports, police documents and hospital records. Not only the kind of weapon was studied but all other parameters were taken into consideration like, cause & manner of death, sex, age, season and areas of injuries on the body.

Results: The analysis quite distinctly highlighted that amongst 2979 deaths, 1275 were because of fire-arms weapons (43.13%). Out of these 1192 (92%) deaths were by rifled weapons, whereas 103 (8%) were by smooth bored fire-arm weapons. Total number of male deaths by fire-arms was 1066 (82.95%), whereas females were 219 (17.05%). All homicidal cases were 788, 46 suicidal, 97 accidental and in 354 the manner remained un-determined. The manner amongst males was, 652 homicidal, 42 suicidal, 82 accidental and in 290 it was un-determined. And in females 136 were homicidal, 4 were suicidal, 15 accidental and in 64 the manner remained un-determined. The ratio of homicidal to suicidal was 17.1:1 and homicidal to accidental ratio was 8.1:1. In 92% cases the rifled fore-arms weapons was used and in 8% it was smooth bored. The rifled fire-arms injuries had multiple entry wounds in 52.9% of deaths and there was single entry wound in 47% death. While there was single entry wound in 66% deaths in smooth bored weapons and in 34% of cases multiple wounds were observed. The range of fire in (56.8%) homicidal deaths was distant, whereas in 30.4% it was close range. Close contact fire was seen in 1.4% of suicidal deaths. 16% cases showed blackening, 10.58% cases had tattooing and in 2.25% cases there was burning.

Conclusion: The fire-arms weapon is the most predominant mean of un-natural deaths. Amongst them the usage of rifled weapons is more than the smooth bored. So this needs formulation of effective law for control of these weapons.

Key Words: Kind of Weapon, Rifle, Smooth Bored, Manner of Death, Homicide, Suicide

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INTRODUCTION

The objectives of medico-legal autopsy are to find out the kind of weapon, whether blunt, sharp or fire-arm etc. and the nature of injury which may be ante-mortem or post-mortem. It also helps to find out not only the cause of death but also the medical cause of death.

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Which means it finds out the organic or systemic damage and the chain of events which is the mode of death. It also gives important information about the manner of death i.e., homicidal, suicidal or accidental.¹ The un-Natural deaths, either caused by physical damage or poisoning, must be thoroughly investigated². Any mark of injury raises a suspicion of foul play, so it must be thoroughly investigated. At times it becomes difficult to declare the injury as homicidal, suicidal or accidental, however the opinion can be framed by thorough investigation. This includes the autopsy findings and other relevant facts of the case under investigation. These facts include circumstantial evidence, crime scene investigation, all the details about injuries and kind of weapon also³.

Most of the medico-legal autopsies are homicidal, which reflects the criminal tendency of the society^{4,5}. Religion of Islam takes very strict notice of homicide,