

Original Research Article

Prevalence of acute pancreatitis in organophosphate poisoning in correlation with elevated serum amylase and lipase level in a tertiary care hospital

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Abstract: The objective is to determine the prevalence of acute pancreatitis and elevated levels of serum amylase and lipase following organophosphate poisoning. This is cross sectional study conducted at medicine department SDM Medical College during period of one year from 2014-2015. Patients of both sexes and age above 14 years admitted with positive history of organophosphate poisoning (op) were included in this study. A proforma was designed and all the collected data containing basic information of the patients, past history, physical examination and relevant investigations like complete blood count, serum amylase and lipase, serum pseudo cholinesterase, alanine amino transferase(ALT), ultrasound abdomen, CT abdomen(where needed) were documented. Among 100 patients in our study group mean age are 40±9 years, most common OP intoxication is methyl parathion. Significant symptoms seen were muscarinic in the form of secretions (87%), pin point pupil (57%), respiratory failure (21%). Marked nicotinic symptoms seen were fasciculations (14%). Significantly elevated amylase (>300u/l) was seen in 36(36%) of patients out of which 11 patients (30.55%) had significantly elevated lipase (>150) levels, confirmation of acute pancreatitis was done by ultrasonography of abdomen. In the elevated serum amylase and lipase levels are more frequently seen in organophosphate poisoning and are associated with acute pancreatitis as a complication.

Keywords: organophosphate poisoning, acute pancreatitis, serum amylase, serum lipase

INTRODUCTION:

Acute organophosphate poisoning is one of the commonest poisoning and has reached epidemic proportions in most parts of the world especially in developing countries where its management is lacking leading to high fatality rate. According to WHO, worldwide estimate of pesticide poisoning is around 3 million each year, with around 2 million hospitalized from suicide attempt majority of which are actually intentional as it is readily available in every home [1, 2].

Organophosphate compounds are diverse group of chemicals used in domestic and industrial settings. The major effect of these agents is irreversible inhibition of acetyl cholinesterase, a neuro transmitter found in the central and peripheral nervous system which causes over stimulation of muscarinic and nicotinic receptors which results in wide spread clinical features like bradycardia, increased salivation, blurred vision, fasciculations etc. [3, 4]. Worldwide mortality studies report mortality rates of 3-25% from organophosphate poisoning[5]. Acute pancreatitis is one of the grave complications of this poisoning [5, 6, 7].

This potentially fatal complication can be overlooked in the absence of typical clinical features of acute pancreatitis [8, 9]. Although we come across large number of patients with this poisoning in our clinical practice, there is not much data available regarding the frequency of high amylase and lipase levels and grave complication of pancreatitis in pesticide poisoning. This is thought to occur from ductal hypertension and pancreatic parenchymal injury [10, 11]. This study was therefore conducted to determine the frequency of elevated amylase and lipase levels and acute pancreatitis in organophosphate poisoning in our set up and to reduce the mortality and hospital stay by its early detection.

METHODOLOGY

This hospital based study was carried out in SDM Medical College Dharwad which is tertiary care centre. Study was conducted over a period of one year 2014-2015. Total of 100 patients (75 males, 25 females) of poisoning with organophosphate insecticide were studied. All patients including both sexes and age >14 years with recent history of organophosphate ingestion, inhalation or cutaneous absorption with clinical

symptoms and signs of organophosphate poisoning were included in this study. Confirmation of poison was done by seeing the container bought by patients family members, composition printed on them and getting laboratory investigation of serum pseudocholinesterase levels which were very low in most of the patients, biochemical evidence of organophosphate poisoning.

Those patients with history of alcohol addiction or had history of gall stones/gastric ulcer in the past were excluded in this study. Patients who had history of drug intake like azathioprine, valproic acid..etc were not included in this study. Serum amylase and lipase levels were estimated using calorimetric assay. Serum amylase level between 0-96 u/l and serum lipase level between 0-60 u/l were accepted as normal. Patients with amylase levels between 100-300 u/l were accepted as possible pancreatitis, and only patients with concomitantly two fold elevated levels of lipase were diagnosed as acute pancreatitis. Ultrasound abdomen was performed in all patients with raised lipase levels to confirm diagnosis of acute pancreatitis. Stastical analysis was performed using SPSS 14.3 which involves paired and unpaired T-test. Mean value and standard deviation were calculated and compared with other studies. P value <0.05 was taken as statically significant.

RESULTS

During study period of one year 100 patients with ingestion of organophosphates were evaluated. Mean age was 40±9 years. Among 100 patients 75 were males 25 were females, male: female ratio is 3:1. Among 100 patients 98 patients were exposed to organophosphate compound through gastro intestinal route(98%), 2 patients via inhalation and none by cutaneous absorption. Most common organophosphate compound consumed was methyl-parathion in 30 cases followed by quinolphos, chlorpyrifos, and monochrotophos in 13 patients each. The most common clinical presentation was excessive salivation seen in 80 patients. Frequently observed clinical signs were pin point pupils seen in 57 patients followed fasciculation seen in 14 patients and respiratory failure in 21 patients. Among 100 patients 36 patients had 3 fold elevated amylase levels, of these 36 patients 11 patients had significantly raised lipase levels (as shown in table 1) suggestive of acute pancreatitis confirmed by ultrasound abdomen. Among these 11 patients 2 patients died due to pancreatitis without respiratory failiure. Serum pseudo cholinesterase was significantly low in most of these patients confirming organophosphate ingestion.

Table 1: Serum amylase levels in organophosphate poisoning

AMYLASE	NUMBERS
<90 U/L	64
90-300 U/L	NIL
>300 U/L	36

Out of 36 patients who had significantly elevated amylase 11 patients also showed significantly elevated levels of lipase >150 u/l.

DISCUSSION:

Cases with acute pancreatitis as a complication with organophosphate poisoning have been reported in literature [12]. Ahamd Arshia, *et al.*; conducted a descriptive study in Karachi for study period of 6 months with 90 patients. Elevated amylase levels were found in 28 patients, elevated lipase was seen in 9 patients which are comparable with our study [13].

S Singh , *et al.*; carried out a prospective study in PGI Chandigarh between 2001-2005 to find the incidence of acute pancreatitis with elevated levels of amylase and lipase in patients with organophosphate poisoning. Of the 79 patients studied, serum amyalse was found to be elevated (>200 S.U) in 37 patients (46.95” %). It has been concluded that mild elevation of serum amylase is common in patients with organophosphate poisoning, however acute pancreatitis is rare [14]. Of the 100 patients in our study 64 patients had normal serum amyalse level; 36 patients had significantly elevated (>300 u/l) serum amylase level which is very significant. Out of 36 patients, 11 patients had significantly elevated (>150 u/l) serum lipase level which is very significant, which was confirmed by ultrasonography of abdomen.

The bad bedside prognostic factors which correlated very well with serum amylase level and serum lipase are convulsion, severe secretion, CNS depression, fasciculation and respiratory failure. So from our study it is estimated that for every patient with organophosphate intoxication we have to do screening for pancreatitis with the help of serum amylase and serum lipase and for confirmation USG abdomen. Our study also shows that there was a significant correlation between markedly elevated serum amylase and serum lipase and respiratory failure and their outcome.

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