Organophosphorus Compounds Poisoning: Picture in Rangpur Medical College Hospital, Bangladesh

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Abstract

Organophosphorus compounds (OPC) poisoning is a major public health problem in low and middle income countries. The incidence varies from country to country depending on easy availability of poison, socio-economic condition and educational background of the people.

This study aimed to determine the frequency, outcome and aetiological aspect of OPC poisoning patient admitted in Rangpur medical college hospital.

It was a cross sectional study carried out in the department of Medicine, Rangpur medical college hospital from 1st December 2011 to 30th November, 2012.

During the study period a total of 703 patients have been studied. The most of the patients were between the age of 18-40 years (91.9%), male (51.6%), married (71.3%) and from rural areas (67.8%). People of different occupations were involved in OPC poisoning, house-wives were the maximum (33.6%) followed by farmers (31.7%). 92% cases were suicidal and 8% accidental. Familial disharmony was the prime cause (92.3%) of suicidal motive. 88% of the patients were survived and 5% died.

OPC poisoning is an important health care problem in our country. Improved awareness, restricting availability and banning more toxic organophosphorus compounds will reduce the incidence of OPC poisoning.

Introduction

Acute poisoning is a major public health problem in low and middle income countries. The poisoning agents involved in our country are different because the social structure, economic status, educational level, awareness of our people and availability of drugs are different from developed countries. Bangladesh is a developing country. The society here is agricultural based. Eighty percent of population is dependent on agriculture directly or indirectly. Pesticides are very easily available here. One of them, organophosphorus compound are widely used as insecticides in agricultural sector by farmers for control of insect vectors.

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In China and South-east Asia pesticides account for about 300000 suicides each year[1]. Another study suggested that each year worldwide there is 3 million acute poisoning with 2,20,000 deaths.[2] Much of this burden is borne by developing countries where more than 80% of cases are fatal pesticide poisoning related hospitalization[3].Whole over the world acute poisoning is a very common medico-social problem. The agents vary from country to country depending on easy availability of poison, socio-economic condition and educational background of the people. In tropical countries organophosphorus compounds are the commonly used agent[4]. Among different types of poisoning, self poisoning is most common.

In Bangladesh poisoning is an important health problem causing around 2000 deaths per year[5]. Self poisoning constitutes more than half of the total poisoning cases admitted in hospital[6]. Most of poisoning have no strong reason for taking poison. Many have family disharmony, frustration, gain attention or get revenge. Mental illness is sometimes proposed for a background of poisoning. Although reducing accessibility to pesticides will decrease poisoning and deaths, socio-economic and cultural factors must also be addressed to make a real difference. OPC poisoning in a country like Bangladesh is not only a public health problem but also related to economics and culture. There is great need to enhance stress on prevention of poisoning. A coordinated and comprehensive response is needed to make any impact.

Materials And Methods

All cases of OPC patient aged 18 years and above from 1st December 2011 to 30th November, 2012, who was admitted in Rangpur medical college hospital, were included in this 12-month cross sectional study. Selection criteria for the patients consist of: (1) Physicians made clinical diagnosis of OPC poisoning (2) Age of 18 years or above and both sexes.

Statistical Analysis

Data was analyzed using SPSS 16 statistical package. A cross sectional analysis was done on all variables to obtain a frequency distribution. The mean±SD and ranges were calculated for quantitative variables. Continuous variables were compared by the Student *t* test. Proportions were analyzed with the chi-square test or 2-tailed Fisher's exact test as appropriate. A *P* value of 0.05 or less was considered statistically significant.

Results

During the study period a total of 703 patients of both sexes were studied, male was slightly more than the female (51.6% vs 48.4%). Minimum and maximum age of the study population was 18 years and 64 years respectively. Table I showing the socio-demographic characteristics of the study population.

Table I: Socio-demographic characteristics of the study population (n=703)

Variable	Frequency	Percent	P value *
Age			
18-40 years	646	91.9%	
41-60 years	50	7%	0.000[s]
>60 years	7	1%	
Sex			
Male	363	51.6%	
Female	257	48.4%	.332[ns]
Marital status			
Married	502	71.45%	
Unmarried	201	28.55%	0.000 [s]
Educational status			
Primary	251	35.7%	
Secondary	336	47.8%	
Higher secondary	76	10.8%	
Graduate and above	09	2.5%	0.000 [s]
Illiterate	31	5.75%	
Occupation			
Service	22	3.2%	
Farmer	223	31.7%	
Student	147	20.9%	
Housewife	236	33.6%	
Business	54	7.65%	0.000
Others	21	2.9%	
Residence			
Rural	477	67.8%	
Urban	226	32.2%	0.000

NS= not significant, S= significant

Analysis of all the variables have shown that <40 years age, married, male sex, people of rural area and educational level below secondary were more involve in OPC poisoning. People of different occupations presented with history of acute poisoning but housewives (33.6%) were the maximum.

Table II: Showing the motive of different OPC poisoning.

Variable	Frequency	Percent	P value*
Suicidal	648	92.2%	
Accidental	55	7.8%	0.000[s]

Chisquare test was done to see the significance of difference.

S= significant

Accidental poisoning cases occurred during spraying in the field, contaminated pond water, household water and in some cases patient suffering from psychiatric illness accidently took the drugs.

Suicidal tendency was more in male (53.01%) than female (46.99%) and maximum (645) of them are 18-40 years age group.

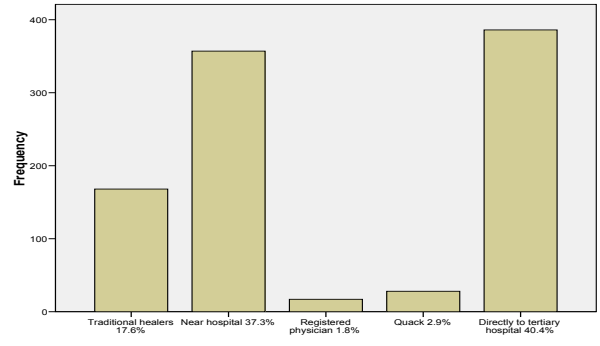
Table III: Showing the causes of suicidal attempt.

Variable	Frequency	Percent	P value*
Familial disharmony	778	92.3%	
Failed in examination	17	2.1%	0.000[s]
Economical loss	14	1.7%	
Chronic illness	31	3.7%	
Others	3	0.35%	

*Chisquare test was done to see the significance of difference.

S= significant

Pre-hospital treatments of the poisoning cases were attempted to induce vomiting by applying bitter or dirty things in mouth.



P value 0.000[s]

Figure: I showing pre-hospital management strategy after acute poisoning

Gastric lavage was given in the entire patient before admission into indoor. In hospital most of the patients received supportive treatments and OPC cases atropine and/ or pralidoxime was given. Total 51 (5.34%) patients died. Among the death cases 27 were male and 24 were female; 38 from rural areas and 13 from urban areas.

Discussion

OPC poisoning is an important medical emergency. Management of these critically ill patients will greatly improve if the common causes of poisoning are properly defined[7]. In this study male was slightly higher than the female1.064:1, Males dominated in a study done in tertiary care hospital in Karnataka, India where male to female[8] ratio was 3:1. However, some other studies have shown that males are marginally higher compared to females[9,10]. A similar picture was found in another study by Rahaman MM, Khan GK, et al. where male female ratio was 1.6:1. This high

proportion of poisoning among males might be due to change in the lifestyle and cultural patterns in this area. In this study, age of the majority of the poisoning cases was between 18-40 years (91.9%). In another study majority (61.7%) was between 12- and 29-year age group. Similar findings were observed in other studies[11]. Married people (71.3%) were observed more than unmarried in OPC poisoning in this study. A study on 2003 in rural India also showed that 63% victims of OPC poisoning were married[12]. By occupation housewife (33.6%) were the maximum followed by farmer (31.7%) and student (20.9%). This findings show similarities with findings of organophosphorus poisoning patients studied in Chittagong Medical College Hospital, where 25.8% were house wife, 14% farmers, 16.1% students [13].

Motive of poisoning in this study was suicidal (92.2%), in another study it was 78.78%. Maximum reported cause of suicidal attempt was familial disharmony (92.3%). Male sex, age group between18-40 and patients from rural area were more involve in suicidal attempt. The WHO reports that pesticides are now the most common method of suicide worldwide.[14] One study showed over half of all hospital admissions for self-harm to a General Hospital in Rio de Janeiro had taken pesticides[15]. Mortality rate was 5.3% and 5.2% leave hospital without permission and few cases (1.9%) were referred to higher center. This differs with different studies where mortality rate was high. A study has shown that, mortality rate with acute poisoning was 16.4% mainly due to organophosphorus compounds. Low mortality rate in this study probably was due to increased awareness of the people and reaching to hospital faster. Poisoning cases are neglected one, these patients are kept in floor and veranda of very busy medicine unit, and there is no separate unit for management of poisoning cases. As there was no support of mechanical ventilation, respiratory failure was tried to manage with endotracheal tube intubation and AMBU bag respiration by patient's relative. Lack of trained doctors, nurses and limited resources have a bad impact to manage the OPC poisoning patients. Hospitals facilities, logistics and staffs could not cope with such type of huge number patients.

OPC poisoning is an important health care problem in our country. The character of poisoning has been changed over time for different reasons. Though mortality rate is not so high, it has an impact on social and family environment. Death cases of organophosphorus poisoning were associated with severe symptoms and higher lethality. Poisoning patients are very much neglected. It is clear that in poisoning there is a specific reason behind this. So doctors, nurses, paramedics and other stuff should be empathetized to these patients and proper counseling is necessary along with treatment to prevent further occurrence. Measures like restricting availability and banning more toxic organophosphorus compounds and drugs may help to prevent poisoning. By increasing facilities of chemical identification of poisoning cases and availability of more effective and specific treatment, fatality of OPC poisoning may fall in hospital.

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