

ORIGINAL ARTICLE

Cause and outcome of poisoning among admitted patients in a teaching hospital

SM Hossain¹, F Kabir², SM Kamal³, MN Islam⁴

Abstract

Background: Pesticide containing organophosphorous compound (OPC), copper sulphate (CuSO_4), harpic, savlon, are easily available allowing opportunities for easy source of poisoning in the southern part of Bangladesh.

Objective: This study was aimed to find out epidemiological characteristics of patient presenting with poisoning & the outcome of poisoning.

Methods: This hospital based prospective cross sectional study was conducted from July to December 2017 in medicine ward among poisoned males and female patients. Sample size was 150 and they were selected from the population by non probability sampling technique.

Results: Among 150 cases OPC are (70,46.66%) followed by sedative drug (21,14%), Harpic (19,12.66%) Street poison (15,10%) copper sulphate (12, 8%) Rat killer (3,2%) Kerosene (2,1.33%) Paracetamol (3,2%) Puffer fish (1,0.66%) Yaba (1,0.66%) other's (3,2%). In this study young age group 21-30 yrs was the most common (41%) victim of poisoning, female to male ratio was 1.32:1. Majority of the patients hailing from rural area (63%) and most of them (33,38.59%) had secondary level of education. Familial disharmony (45%) was the commonest background for poisoning. Study showed that 82% of the patients recovered completely during follow up and 7% patient developed complication. Mortality rate was 11%.

Conclusion: OPC poisoning is the commonest poisoning. Early hospitalization, severity assessment & prompt institution of appropriate therapy can make a favorable outcome.

Key words: Poisoning, Suicidal attempt, Outcome.

Introduction

Self poisoning is one of the commonest acute medical presentations in the tertiary level hospital of Bangladesh. Organophosphorus (OPC) poisoning is a major clinical and public health problem in many parts of the world.^{1,2} Estimated case load of poisoning in hospitals of Bangladesh is around 7% of total admission.³ Although most deaths occur in rural areas of developing countries; OPC poisoning is still a problem in the developed countries, where it may account for a significant proportion of death from self poisoning. The case fatality of self poisoning in developed countries is estimated as 10% but for OPC it may be as high as 30%.^{2,3} In Bangladesh poisoning is an important health problem causing around 2000 deaths per year.⁵

The time interval between the exposure to OPC poison and onset of symptoms varies with the route and degree of exposure. Following massive ingestions, the symptoms appear within minutes. However, in most instances symptoms appear within 30 minutes of exposure and almost always within 12 hours. Local effect on eyes and respiratory tract may appear within minutes. After ingestion of OPC, the initial symptoms are gastrointestinal and other symptoms depend on organs affected.^{1,4} Most patient die from Cardiorespiratory failure.⁶ Copper sulphate is very cheap and is used by farmer. It causes jaundice hepatic failure, renal failure. Sedative drug causes coma and cardiorespiratory depression. Harpic causes intense damage to the pharynx, oesophagus and stomach, often producing stricture, perforations.

1. Sk Moazzem Hossain FCPS, Asstt. Professor (Medicine), Khulna Medical College (E-mail: drmoazzemhossain72@gmail.com)

2. Farjana Kabir FCPS, Junior consultant (Medicine), RP (Medicine), Khulna Medical College Hospital

3. SM Kamal FCPS, Professor (Medicine), Khulna Medical College, Khulna

4. Nazrul Islam FCPS, Asstt. Professor (Medicine), Khulna Medical College

This paper was aimed at identifying the common poisons used in Bangladesh among male and female subject. Therefore the present study was conducted to explore the clinical feature & epidemiological characteristics of patient presenting with poisoning & the outcome of patient.

Materials & Methods

This hospital based prospective cross sectional study was conducted among poisoned adult males and females admitted in hospital. From July to December 2017. Sample was selected from the population by non probability sampling technique. Sample size was 150. Detail demographic, clinical data were collected from the informant and recorded in structured case report form. Diagnosis was made on the basis of patient's statement, statement of the witness, brought specimen and characteristic features of poisoning, clinical examination and available records. After fulfilling the inclusion and exclusion criteria, patient were enrolled with unique ID. Subjects were briefed about the objectives of the study, risk and benefits, freedom for participating in the study and confidentiality. Informed consent was obtained accordingly. Patient was managed according to the feature of corresponding aetiology. Relevant laboratory investigations were performed. The patient was kept under follow up daily until death or discharge from hospital. The prestructured Case Record Form (CRF) was filled up by the study physician. All the collected data questionnaire were checked very carefully to identify errors. Data was processed and analysed with the help of computer program Statistical Package for the Social Sciences (SPSS) and Microsoft excel. Quantitative data expressed as mean and standard deviation and qualitative data as frequency and percentage. Comparison was done by tabulation and graphical presentation in the form of tables, pie chart, graphs, bar diagrams, histogram & charts etc.

Result

According to the questionnaire, history of all the 150 cases were taken, the clinical examination was carried out meticulously. Regarding incidence of poisoning was highest 61(41%) in 21-30 years age group (Table 1). Females are more affected than Male. In my study 37% were male and 63% were female. Female to male ratio was 1.70:1.

Table I
Age and gender distribution of the poisoned patients

Age (years)	Number of patients (%)		Total
	Male	Female	
≤ 20	9(16.21)	41(42.85)	50
21-30	39(70.27)	22(23.80)	61
31-40	5(8.10)	17(19.04)	22
41-50	3(5.40)	9(9.52)	12
>50	0	5(4.76)	5

Females were significantly younger than males. Large number of female patients (41,42.85%) were in the age group <20 years.

Regarding education level of poisoned patients secondary and higher secondary were the most common group of poisoning patient. Twenty eight (28%) of them were secondary school education level and thirty one (31%) were higher secondary school status and nine (9%) were graduate students. In female patients majority (34,34.92%) were higher secondary level of education. In case of male patients majority were (22,40.54%) secondary level of education (Table II).

Table II
Educational level of patients

Education level	Number of patients (%)		Total
Primary	7(13.51)	14(14.28)	21
Secondary	22(40.54)	20(20.63)	42
Higher secondary	13 (24.32)	34(34.92)	47
Graduate	3(5.40)	10(11.11)	13
Above graduate	3(5.40)	2(1.58)	5
Others	5(8.10)	17(19.04)	22

Among the patients the poor class (45,61%) comprising the major percentage of the patients, which is followed by middle class (40,30%) and remaining are upper class (15,9%). Among the all poisoned substances Organophosphorus Compound (OPC) were the most commonly employed suicidal agents, and were ingested in 46.66% of cases. Next common is sedative drug poisoning. Another common is copper sulphate poisoning (8%) (Table III).

Table III
Types of poisonous substance

Substances	Number of patients	Percentage
Organophosphorus Compound (OPC)	70	46.66
sedative drug	21	14
Street poison	15	10
copper sulphate	12	8
Rat killer	3	2
Kerosene	2	1.33
Paracetamol	3	2
Puffer fish	1	.66
Yaba	1	.66
Mixed drug	3	2

Nearly half of the patients (43%) sought medical care within 2 hours, Nearly one fourth patients 34% within 4 hour, 16% patients within 1 hour and 5% patients within 4 to 6 hours. Only 2% asked for medical care 6 hours after poisoning. Delay beyond an hour indicated that the patients were at risk of having complications of poisoning. In all cases medical care was asked by their relatives or their guardians.

Table IV
Underlying causes of poisoning

Stressful events	Number of patients		Total	%
	Male	Female		
Familial disharmony	37	30	67	45%
Failure in love	6	36	42	27%
Misunderstanding with patients	3	12	15	10%
Education related	2	8	10	7%
Extramarital relation	1	5	6	4%
Chronic ill health	3	0	3	2%
Unknown	3	3	7	4%
Accidental poisoning	1	0	1	0.05%

Study shows family disharmony (45%) was the commonest background of poisoning (Table IV). Failure in love (27%) was the next common, Education related (7%), Misunderstanding with parent (10%), extramarital relation (4%), Out of the 150 patients, 2 patients (2%) were known to have psychiatric illness. On examination, 12% OPC poisoning patient are severely poisoned according to POP scale, 32% patient presented with neurological manifestation. (Table V).

Table V
Clinical manifestation and severity of poisoning

Para meter	Number of case	(%)	
Severity of poisoning (POP scale)	Mild	97	65
	Moderate	35	23
	Severe	18	12
Clinical manifestations (system)	Gastrointestinal	136	91
	Pupillary	135	90
	Glandular	117	78
	Respiratory	112	75
	Central nervous system	48	32
	Cardiovascular system	45	30
	Urinary	30	20

Study showed that 82%. of the patients completely recovered, 7% patient developed complication, Mortality rate 11% (Table VI). Complications are intermediate syndrome, delayed polyneuropathy. (OPIDN) and oesophageal ulcer, stricture (Harpic Poisoning).

Table VI
Outcome of Treatment

Outcome	Number of patients		Total	%	
	Male	Female			
Recovery	51	72	123	82	
Complication	3	7	10	7	
Expired	OPC	4	7	11	
	Harpic	1	2	3	
	Cuso4	0	1	3	11
	Sedative	0	1	1	
Street Poison	0	1	1		

Discussion

Study (carried out in four hospitals) of Chittagong Division observed OPC poisoning as leading cause of morbidity and mortality due to poisoning.^{3,4} In our study OPC poisoning (46.66%) was the most common, followed by sedative Poisoning (14%), street poisoning (10%), Copper sulphate poisoning (8%). The WHO reports that pesticides are now the most common method of suicide worldwide.¹⁶ All these findings correlates with other study in home and abroad. In our study, street poisoning patient

was found unconscious in bus station, launch station, and carried to hospital by public or police. Sign symptom are similar to sedative poisoning.

Young age group 21-30 yrs was the most common victim of poisoning worldwide.^{7,8} We found that maximum numbers of male patients 39(70.27%) were in age group between 21-30 years and females were significantly younger than males. Female patients 41(42.85%) were in the age group <20 years.

In our study, the significant majority of patients attempting self poisoning were female (63%) and female to male ratio was 1.7:1, which is nearly equal to a study conducted in Teaching Hospital Peradeniya, Sri Lanka¹¹, where 949 participants were included, of whom 44.2% were males.

In this study we observed that familial disharmony 67(45%) was the major causal factors for suicide or self harm. This findings quite differs from the study of carter G et al, which demonstrated that suicide has multiple risk factors and associated comorbidities, such as mood disorders, personality disorders, substance misuse and poor physical health.¹³ The dissimilarity of these findings in three culturally diverse locations led us to the suggestion that even relatively minor conflicts within the family environment can act as a trigger for suicide attempts, perhaps due to the emotional importance placed on these relationships. Suokas et al, demonstrated that previously identified risk factors for subsequent suicide following deliberate self harm include previous self harm, male gender, older age, psychiatric illness (particularly schizophrenia, depression, bipolar disorder and substance related disorders), medical illness and substance misuse.¹⁴

In this study, another leading reason for suicide attempts was found to be failure in love (27%). This would appear to be an issue particularly with young female person. As in this age, physical and sexual maturity occurs among these population which induces them to fall in love and affair. Other factors thought to influence suicide rates in students are substance abuse and cigarette smoking. In this study 2% of patients had history of chronic disease or psychiatric illness. This finding is similar to others findings.

In our study cause of 4% cases poisoning could not be identified. One patient presented with accidental poisoning of OPC during spraying of pesticide in crops.

Present study showed that 82% of the patients recovered completely, 7% developed complication and 11% died. Another study has shown that mortality rate with acute poisoning was 16.4% mainly with OPC.¹⁷ In Nepal Rehimans et al showed 14% patients died in OPC poisoning.¹⁵ This may be due to delay, in transporting patients across long distances to hospital, paucity of healthcare workers compared with the large number of patients, lack of training for the management of OPC poisoning, lack of logistic support, efficient manpower and ICU availability.

Conclusions

OPC poisoning is the commonest poisoning and familial disharmony is the prime cause of poisoning. So urgent government initiative for controlled use of pesticide is needed. However a multicentre nationwide study could address the study objective in a meaningful way. Early hospitalization and prompt institution of appropriate therapy can make a favourable outcome in poisoning patient.

References

1. Roberts DM, Karunarathna A, Buckley NA, Manuweera G, Sheriff MH. Influence of pesticide regulation on acute poisoning deaths i Sri Lanka. Bull World Health Organ 2003; 81: 789-98
2. Gunnel D, Eddleston M. Suicide by intentional ingestion of pesticide: a continuing tragedy in developing countries. IntJ Epidemiol 2003; 32: 902-09
3. Roberts DM, Aaron CK Management of Acute organophosphorus pesticide poisoning. BMJ 2007; 334: 629-34
4. Peter jv, mORAN jl, Graham P. Oxime therapy and ojutcornes in human OPC poisoning an evaluatio using meta analytic techniques. Crit Care Med 2006; 34: 502-10
5. Baloach GH. khan AH. Madhudas C. Dmajani BE et al. Outcome of acute organophosphorus poisoning at Liaquat University Hospital Hyderabad, Pakistan. World ACP Sci J 2011; 13: 266-288
6. Davies JOJ Eddleston M,. Buckley Na Predicting Outcome in actue organophosphorus Poisoning with a poison severity score of the Glasgow coma scle OJM 2008; 101: 371-379
7. Kumar SV Fareedullah K Sudhakar Y, Venkateswarln B. Cerrent review on organophophorus, poisoning. Archives of applied science research 2010; 2: 199-205

8. Gunnell D, Fernando R, Hewagama M, Priyangika WDD, Konradsen F, Eddleston M, The Impact of Pesticide regulation of suicide in Srilanka; *International Journal of Epidemiology* 2007; 36: 1235-1242
9. Buckley NA, Roberts D, Eddleston M. Overcoming apathy in research on organophosphate poisoning. *BMJ* 2004; 329: 1231-3
10. Chowdhury FR, Rahman AU, Mohammed FR, Chowdhury A, Ahasan HA, Bakar MA. Acute poisoning in southern part of Bangladesh the case load is decreasing. *Bangladesh Med Res Counc Bull* 2011; 37: 61-5
11. Rajapakse T, Griffiths KM, Christensen H, Cotton S. A comparison of non fatal self poisoning among males and females, in Sri Lanka. *BMC Psychiatry* 2014; 14: 221
12. Dewan G. Analysis of recent situation of pesticide poisoning in Bangladesh; is there a proper estimate? *Asia pacific Journal of Medical Toxicology* 2014; 3: 76-83
13. Carter G, David M, Reith DM, Whyte M, Pherson M. Repeated self poisoning: increasing severity of self harm as a predictor of subsequent suicide. *The British Journal of Psychiatry* 2005; 186: 253-257
14. Suokas J., Suominen K, Isometsa E., et al Long term risk factors for suicide mortality after attempted suicide findings of a 14 year follow up study. *Acta Psychiatrica Scandinavica* 2001; 404: 117-121
15. Rehiman S, Lohani SP, Bhattarai MD Correlation of serum cholin esterase level, clinical score at presentation and severity of organophosphorus poisoning *Nepal Med Assoc* 2008; 147: 47-52
16. Bertolote JM, Fleischmann A Butchart A, Besbili N: Suicide, Suicide attempts and pesticides: a major hidden public health problem. *Bull World Health Organ* 2006; 84: 260
17. Munga G, Sam KG, Khera K, Pandey Set al. Evaluation of incidence, clinical characteristics and management in organophosphorus poisoning patients in a tertiary care hospital. *J Toxicol Environ Health Sci* 2010; 2: 73-76