Original Article

Pattern of suicidal poisoning in a tertiary care hospital

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ABSTRACT:

Introduction: *Poisoning is a global public health problem accounting for a significant proportion of emergency admission. It yields remarkable death toll in Bangladesh. Better outcome depends on type of poisons, early diagnosis and proper treatment. This study aims to identify the pattern, management, and outcome of suicidal poisoning in a tertiary care hospital.* ***Methods:*** *We conducted a cross-sectional study on 324 consecutive patients with poisoning aged 12 years and older in the Department of Medicine, Sheikh Sayera Khatun Medical College Hospital, Gopalganj, from January 2019 to June 2019.* ***Result:*** *We enrolled 324 patients with acute poisoning during our study period. The age of the patients varied from 13 to 75 years (mean 24.49, SD of 10.74) with 15 to 24 years age group accounted for 50.9% (n=165) of the cases. Females predominated (51.9%) over males. Most of the incidents (78%) was suicidal. Organophosphate pesticides (48.8%) and herbicides (21.42) were the two top ranked causative agents for suicidal intention, while sedatives and smokeless tobacco (gul) accounted for 61.9% and 19% of parasuicidal attempts respectively. We found statistically significant association between poisoning outcome and gastric lavage (P=0.013).* ***Conclusion:*** *Poisoning is common in our society. Suicidal poisoning is more common and it is more prevalent among females. Insecticides and herbicides are commonly implicated in suicidal poisoning.*

Keywords: *Insecticide, herbicide, poison, suicide, antidote*

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INTRODUCTION:

"Poisoning is a significant global public health problem."[1] It is one of the important causes of patient admission to emergency department and Intensive Care Units (ICU).[1] Poisoning is an important health problem in Bangladesh as well causing around 3, 00,000 episodes and around 2000 death per year.[2] The adverse consequences of poisoning are higher in underdeveloped and developing countries because of presence of weak health regulations and poor health care services.[3] Moreover, the holistic management of poisoning includes general or supportive measures, use of specific antidotes, and psychosocial intervention. The appropriate emergency management of poisoning requires accurate assessment and immediate therapy. A better prognosis can be expected with early diagnosis and proper treatment[4] In the absence of a poison information center in Bangladesh, hospital based toxico-vigilance can provide toxico-epidemiological information to design focused interventions.[5] In the past years, only few studies have investigated the pattern and outcome of poisoning cases. Hence, this study aims to identify the pattern, management, and outcome of suicidal poisoning in a tertiary care hospital of Bangladesh.

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METHODS AND MATERIALS:

We conducted an observational, cross-sectional study in the Department of Medicine, Sheikh Syera Khatun Medical College Hospital (SSKMCH), Gopalganj. Primary data collection was done from January 2019 to June 2019.

The inclusion criteria were:

- Consecutive patients with poisoning, aged 12 years and older

The exclusion criteria were:

- Patients with poisoning below 12 years
- Patients with diagnosis of snakebite and insect bite
- Patients with allergic drug reactions
- Patients with diagnosis of poisoning who were dead on arrival

We used pre- structured questionnaires for data collection. We also reviewed the medical records, and interviewed caregivers where required. Trained personnel were involved in the process of data collection.

Demographic data, type and time of poison intake, manner of poisoning, management, and treatment outcome were extracted and recorded. Diagnosis of poisoning was made on the basis of history of exposure or contact and characteristic features. It was not supported by measurement of plasma poison concentration or specimen analysis.

All of the data was analysed using the Statistical Package for Social Science (SPSS) version 25.0. Categorical variables were compared with Chi-square test or Fisher-exact test whichever was appropriate. P value less than 0.05 was considered statistically significant.

Ethical clearance was acquired from the Institutional Ethical Review Committee (IERC) of SSKMCH, Gopalganj. All patients or their legal guardians provided informed written or verbal consent.

RESULTS:

Over the study period of six months, 324 poisoning cases were enrolled. All poisoning cases were due to oral exposures.

Ages ranged from 13 years to 75 years (mean 24.49, SD of 10.74). Patients aged 15 to 24 years old accounted for 50.9% of the cases. Females comprised 51.9% of all intentional as well as unintentional poisoning cases (Figure 1). Rural patients (75%, n=243) outnumbered urban patients, while 62.96% (n=204) of the victims were married (Table 1).

Figure 1. Percentage of poisonings compared with age distribution and sex. The bar graph indicates the percentage of poisoning cases with their age and sex distribution (n = 324). The blue colour indicates the percentage of males and the red the percentage of females in each group.

Regarding level of education, patients of secondary education background were affected in 46.29% (n=150) of cases, while 28.7% (n=93) belonging to primary level of education. Occupation-wise, poisoning was commonly found among housewives (39.8%) followed by students (36.1%), businessmen (10.2%), farmers (7.4%) and service-holders (6.48%) (Table 1).

Table 1. Demographic distribution of study population according to intention of poisoning

Demographic characteristics		Intention of poisoning					
		Suicidal (%)	Homicidal (%)	Parasuicidal (%)	Accidental (%)	Total (%)	P value*
Gender	Male	108 (33.3)	6 (1.85)	42 (12.96)	0 (0.00)	156 (47.85)	0.12
	Female	144 (44.44)	3 (0.92)	21 (6.48)	0 (0.00)	168 (51.85)	
Residence	Rural	213 (65.64)	0 (0)	30 (9.25)	0 (0.00)	243 (75.00)	<0.0001
	Urban	39 (12.03)	9 (2.77)	33 (10.18)	0 (0.00)	81 (25.00)	
Marital status	Married	177 (54.62)	6 (1.85)	21 (6.48)	0 (0.00)	204 (62.96)	0.007
	Unmarried	75 (23.14)	3 (0.92)	42 (12.96)	0 (0.00)	120 (37.04)	
Level of education	Illiterate	39 (12.03)	3 (0.92)	0 (0.00)	0 (0.00)	42 (12.96)	0.088
	Primary	78 (24.07)	0 (0.00)	15 (4.62)	0 (0.00)	93 (28.70)	
	Secondary	102 (31.48)	3 (0.92)	45 (13.88)	0 (0.00)	150 (46.29)	
	Higher	33 (10.18)	3 (0.92)	3(0.92)	0 (0.00)	39 (12.03)	
Occupation	Student	72 (22.22)	3 (0.92)	42 (12.96)	0 (0.00)	117 (36.11)	0.07
	Farmer	24 (7.40)	0 (0.00)	0 (0.00)	0 (0.00)	24 (7.40)	
	Housewife	111 (34.25)	3 (0.92)	15 (4.62)	0 (0.00)	129 (39.81)	
	Businessman	24 (7.40)	3 (0.92)	6 (1.85)	0 (0.00)	33 (10.81)	
	Service-holder	21 (6.48)	0 (0.00)	0 (0.00)	0 (0.00)	21 (6.48)	
Total		252 (77.78)	9 (2.77)	63 (19.44)	0 (0.00)	324 (100.0)	

*Chi-square

Approximately 78% (n=252) of the total number of cases included in this study were known to be suicidal. Among the subset of cases, females accounted for 57.14% (144/252) of these suicidal cases. The causative poison was documented in 93.5% (303/324) of cases. Ingestion of organophosphate (OP) pesticides, herbicide and sedatives accounted for 38.9% (126/324), 16.7% (54/324) and 15.7% (51/324) of cases, respectively. Other types of poisoning occurred using smokeless

tobacco (Gul), house-hold cleaners, kerosene, and unknown substances (Table 2). The median time interval between poisoning event and arrival at the health centre was 1.5 h (IQR: 1–3.7 h).

Table 2. Type of acute poisoning (n = 324).

Type of poison	Frequency	Percent
Organophosphate	126	38.9
Herbicide	54	16.7
Kerosene	9	2.8
Sedative	51	15.7
Smokeless tobacco (Gul)	27	8.3
Household cleaners	36	11.1
Unknown	21	6.5

Gastric lavage was performed in 55.6%(n=180) of the patients. In 29.62% (n=96) of cases gastric lavage was not given due to delayed presentation (>2 hours), while in 13.88% (n=45) of cases it was contraindicated. Regarding treatment and outcome, 120 (37%) received specific antidote, i.e., atropine, and pralidoximes for pesticide poisoning. The median duration of hospitalization was 4 days (IQR: 2–6 days). Among all recruited participants, 88.9% (n=288) improved, 2.8% developed complications and was referred, whereas 8.3% died. Favourable outcome was attained in poisoning cases treated with gastric lavage (Table 3).

Table 3. Treatment outcome in relation to gastric lavage.

	Outcome of treatment				
Gastric	Improved	Referred	Death	Total n (%)	P value
Given	174 (53.7)	3 (0.92)	3 (0.92	(55.5	0.013
Not given	114 (35.2)	6 (1.85)	24 (7.40	144 (44.4	
Total (%)	288 (88.80)	9 (2.77)	27 (8..33)	324 (100.0)	

*Chi-square

DISCUSSION:

In this cross-sectional study involving hospitalized patients with acute poisoning, we aimed to assess the socio-demographic factors, pattern of management and outcome of suicidal poisoning. Even in this short time frame, the burden of poisoning was high.

Female patients and young people of second and third decades accounted for the majority of the cases in our study. Predominance of women and young people were also reported in studies from Bangladesh, Sri Lanka and India.[6,7,8] This might be due to increase burden of factors among female that contribute to commit suicide in male dominant society in under developed countries. While in some studies either there was equal distribution of poisoning among gender or poisoning was common in male.[9, 10, 11]

We reported statistically significant association between rural residence and intention of poisoning. It has also been shown by the another study conducted in Sylhet, Bangladesh.[12] Suicidal poisoning occurred in 78% of our cases. This is in agreement with the findings of previous studies done in Bangladesh and Nepal.[13, 14] Organophosphates are responsible for the majority of deaths in most self-reported poisonings in Bangladesh.[15] Data derived from the present study revealed 38.9% (126/324) of cases were due to organophosphate when a cause was known, injuring predominantly women (52.38%). This was consistent with one previous study, but inconsistent with another in which males were more frequent abusers of organophosphates.[16] These results indicate that public health measures to improve prevention of self-harm could potentially reduce morbidity and mortality related to such chemicals, with opportunities to increase mental health support to reduce suicidal ingestions. Limiting the use of

insecticides and herbicides, and replacing them with the newer least toxic agents may also be useful in this aspect.

.In Bangladesh, mortality from poisoning cases was reported as 5.1%.[17] Mortality in the current series was 8.3% which is higher than in Khulna (7.36%), Rangpur (5.3%) and Sylhet (5.1%).[18,19] This higher mortality may be caused by delayed access to medical care, inadequate training of emergency care personnel regarding poisoning case management and lack of ICU support in the study hospital.

Our study has several limitations. First, we did not assess the socio-economic condition and risk factors of poisoning patients. Second, sample size was small and study period was short. Future large scale field studies may address these issues.

CONCLUSION:

Poisoning is common in our society having significant morbidity and mortality. Suicidal poisoning is more common and it is more prevalent among females. Organophosphate insecticides and herbicides are the commonly ingested poisons. Government regulations, educational awareness and poison information centres will help to decrease the growth of this public health problem.

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