

## Clinico-Epidemiological Study of Self-Poisoning by Different Pharmaceutical Agents

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### Abstract

**Background:** In Bangladesh self-poisoning cases are mostly of organophosphorous compound (OPC). It is documented that 14% of all deaths amongst 10 to 50 year old women in Bangladesh were due to poisoning, the majority following suicidal ingestion of pesticides. In tertiary level hospital, a large number of self-poisoning cases are of different pharmaceutical agents, mostly from urban areas and mostly of teenager group. So the trend of self-poisoning is different in urban area than that of rural area. These pharmaceutical agent self-poisoning cases admitted into the hospitals have different modalities of clinical features with variable outcomes and socioeconomic background. But there is no actual data of these self-poisoning by the different pharmaceutical agents. Therefore, this study was aimed to describe the pattern of self-poisoning by different pharmaceutical agents. **Methods:** A descriptive longitudinal study was conducted in five adult medicine units of a tertiary level hospital from January 2008 to June 2008. All self-poisoned patients with different pharmaceutical agents were included with their prior informed written consent. A pre-tested questionnaire was used for data collection. **Results:** A total of 281 patients were interviewed. Most of the patients were female (70.8%) with highest age range from 13 to 30 years (91.81%). Most of the patients were students (53%) and 40.9% were secondary school certificate pass. 60.1% patients were unmarried. Most of the patients were from urban area (84%). The commonest background for self-poisoning was family disharmony (74.46%). Most common offending pharmaceutical agents were benzodiazepines (44.10%), collected mostly from local dispensary without prescription (89.33%). Most of the patients consulted within 1 to 2 hours of poisoning (44.5%). Commonest consultation before admission was in a Government hospital (48.40%). Only 3 patients (1.10%) were known to have psychiatric illness. Five patients (1.80%) had previous history of self-poisoning. Most of the patients (89.3%) stayed in the hospital for 1 day with no mortality. **Conclusion:** Self poisoning by pharmaceutical agents is common especially in urban areas. Common offending pharmaceutical agents were benzodiazepines. The commonest background for self-poisoning was family disharmony. [J Shaheed Suhrawardy Med Coll 2016;8(1): 17-22]

**Keywords:** Self-poisoning, Different pharmaceutical agents.

### Introduction

A self-poisoning episode may be defined as the self exposure of an individual (by ingestion or inhalation) to an amount of substance associated with the significant potential to cause harm<sup>1</sup>. Self-harm has often been thought of as a problem particular to the industrialized world. Recent work has, however, begun to emphasize its importance in the developing world: the Global Burden of Disease study<sup>2,3</sup> reported that 593000 people killed themselves in the

developing world during 1990, 75% of the world-wide total of deaths from self-harm<sup>4</sup>.

Many studies have shown that deliberate self-poisoning has a far higher mortality than accidental poisoning<sup>5-8</sup>. It is clear from many studies that not all people who die following acts of self-harm actually wish to die<sup>9-12</sup>. Instead, the acts are used to express rage or hostility, or to gain revenge by causing distress to another person<sup>13</sup>. In some cultures, this may be seen as the only means with which to express one's

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anger with someone<sup>14,15</sup>. People who do want to kill themselves often do not succeed; in contrast, others with little or no suicidal intent die from their act<sup>16</sup>. Many factors affect the outcome, including the degree to which the poison's toxicity was understood, the speed with which the person comes to clinical attention, and the availability of effective medical treatment. It is often difficult to determine whether a person who died actually wished to do so<sup>13</sup>. The toxicity of available poisons<sup>17,18</sup> and the paucity of medical services in the developing world ensure that the mortality rate for deliberate self-poisoning is also high, at 10-20% far higher than the 0.5-1% commonly found in industrialized countries<sup>19-21</sup>.

Agrochemical pesticides are a major public health problem throughout the developing world<sup>22-27</sup>. Organophosphate (OP) pesticides were responsible for the majority of deaths in most series of self-poisoning cases, particularly those from rural areas.

Medicines are used in cities throughout the developing world for self-harm; outside of the cities they are relatively uncommon, their prominence being replaced by pesticides. In general, they cause few deaths, particularly when compared to pesticides. However, chloroquine is an important and common exception to this rule<sup>13</sup>. CNS-acting drug is the commonest medicines used for self-harm throughout the developing world's cities. While there are few case series of antiepileptics, benzodiazepines or antidepressants<sup>28,29</sup>, barbiturates were an extremely common means of self-poisoning during the 1970s, and large series exist from this time<sup>28, 29-32</sup>.

In Bangladesh self-poisoning cases are mostly by organophosphorous compound (OPC). A study demonstrated that 14% of all deaths amongst 10-50-year-old women in Bangladesh were due to poisoning, the majority following suicidal ingestion of pesticides<sup>33</sup>. The majority of these cases are from rural area. In tertiary level hospital a large number of self-poisoning cases are of different pharmaceutical agents, mostly from urban areas and mostly of teenager group.

So, the trend of self-poisoning is different in urban area than that of rural area. These cases of pharmaceutical agent self-poisoning admitted into the hospitals have different modalities of clinical features with variable outcome and socioeconomic background. But there is no actual data of these self-poisoning by the different pharmaceutical agents.

Therefore reducing morbidity, mortality and future handicaps over familial, social and national economic condition, require to reduce the incidence of harmful behavior and to improve medical management of acute poisoning.

So this study was aimed to identify the common pharmaceutical agents used for self harm with their clinico-epidemiological background.

**Materials and Methods**

Place of study: Five adult medicine units of Dhaka Medical College Hospital, Dhaka.

Type of study: It was a longitudinal study and descriptive in nature.

Period of study: From January 2008 to June 2008.

Selection of subjects: Patients with history of self-poisoning by different pharmaceutical agents admitted in five adult medicine units of DMCH was evaluated.

Inclusion criteria:

1. Adult patients admitted in medicine units of Dhaka Medical College Hospital through emergency or outpatient department with a history of self-poisoning by pharmaceutical agent/agents.

Exclusion criteria:

1. Diagnosis of other causes of poisoning except self-poisoning by different pharmaceutical agents

2. Presence of any other previous organic cause of altered consciousness or coma.

3. Unwilling to give informed consent by patients or patients' relatives.

Data collection:

All data was collected in individual case record form.

Data analysis:

Data was analyzed using statistical program SPSS 11.0 Results was described as percentages. Some of the baseline characteristics of the cases were expressed as means and others as percentages.

Procedure:

There were five medicine units in Dhaka Medical College Hospital. All patients including patients of self-poisoning were get admitted in Medicine in patient departments in a twenty four hour basis. After obtaining written informed consent from the self-poisoned patient himself/ herself or from the patient's guardian, data was recorded in a pre-tested questioner.

**Results:**

During the period of 6 (Six) months, from January 2008 to June 2008, a total of 11747 patients were admitted in 5 (Five) adult Medicine units of Dhaka Medical College Hospital. Out of total admitted cases, 1649 (14.03%) were poisoning cases and out of total poisoning cases, self-poisoning by different pharmaceutical agents were 281 (17.04%); of them there is no death.

**Table-I: Admission due to poisoning in five adult Medicine units of DMCH from January 2008 to June 2008.**

Hospital admission profile in five adult Medicine units	Number	Percentage
Number of patients admitted	11747	-----
Total poisoning cases (n= 11747)	1649	14.03%
Self-poisoning cases by different pharmaceutical agents (n= 1649)	281	17.04%

**Table-II: Socio-demographic features of self-poisoning cases (n=281) by different pharmaceutical agents.**

	Socio-demographic features	Number	%
Age (years)	13-20	130	46.26
	21-30	128	45.55
	31-40	18	6.40
	41-50	3	1.07
	51-60	2	0.71
Sex	Male	82	29.2
	Female	199	70.8
Marital status	Married	109	38.8
	Unmarried	169	60.1
	Separated	3	1.1
Occupation	Service holder	33	11.7
	Farmer	3	1.1
	Student	149	53
	House wife	70	24.9
	Business men	8	2.8
	Others	18	6.4
Education	Primary	22	7.8
	Secondary school certificate	115	40.9
	Higher secondary school certificate	93	33.1
	Graduate	46	16.4
	Above graduate	1	0.4
Residence	Urban	236	84
	Rural	45	16
Religion	Islam	262	93.2
	Hindu	18	6.4
	Christian	1	0.4
	Others	00	00
Monthly family income (Tk)	< 5,000	54	19.21
	5,000 - < 10,000	128	45.55
	10,000 - < 15,000	89	31.67
	>15,000	10	3.57

Table (II) shows that majority(46.26%) of self-poisoning cases by pharmaceutical agents were between 13 to 20 years old. Next age grouped involved 21 to 30 years (45.55%). Female (70.8%) were predominant over male (20.2%). Female to male ratio was 2.43:1. Out of them 60.1% were unmarried and 1.1% were separated. Most of them were students (53%). 40.9% cases were secondary school certificate pass. Only 1 case (0.4%) was above graduate level. Most of the poisoning cases were from urban area (84%). Muslims were predominant (93.2%). Majority (45.55%) family monthly income was 5,000 taka to less than 10,000 taka.

**Table-III: Circumstances of poisoning**

Circumstances of poisoning	Frequency of circumstances of poisoning
Family disharmony	70.46%
Fail to pass exam	6.05%
Economical loss	3.20%
Breaking affairs	10.67%
Others	9.61%

Figure (III) shows most of the circumstances of poisoning were due to family disharmony (70.46%). Fail to pass exam (6.05%), economical loss (3.20%) and breaking affairs (10.67%) were also contributing factors.

**Table-IV: Drugs used for self-poisoning**

Name of drugs	Frequency of poisoning
Benzodiazepines (BDZ)	44.10%
Mixed drugs	16.70%
Tricyclic antidepressant agents	7.80%
Other sedatives	9.60%
Paracetamol	4.60%
Others drugs	11%
NSAIDs	1.40%
Unknown drugs	4.60%

Figure (IV) shows, drugs used for self-poisoning majority were benzodiazepines (44.10%). Next to the BDZ, common drugs were mixed drugs (16.70%), tricyclic anti-depressant agents (7.80%), other sedatives (9.60%), paracetamol (4.60%), others drugs (11%) and NSAIDs (1.40%). 4.60% drugs could not be identified.

**Table-V: Source of drug collection**

Source of drug collection	Frequency of source
Dispensary	89.33%
House hold members' using drugs	7.47%
Others	3.2%

Table (V) shows, most of the offending drugs were collected from dispensary (89.33%). 7.47% drugs were collected from house hold members' using drugs.

**Table-VI: Number of occasions in collecting drugs**

Number of occasions in collecting drugs	Frequency of occasions in collecting drug
At a time	93.95%
At multiple occasions	6.05%

Table (VI) shows most of the drugs were collected at a time (93.95%) and rest of them collected in multiple occasions (6.05%).

**Table-VII: Time interval between poisoning & treatment seeking**

Time interval between poisoning & treatment seeking	Frequency of interval
0-1 hour	30.20%
1-2 hour	44.50%
2-4 hour	19.20%
4-6 hour	5.7%
More than 6 hour	0.40%

Table (VII) shows nearly half of the patients (44.50%) sought medical care within 1 to 2 hours. Nearly one third patients (30.20%) within 1 hour, 19.20% patients within 2 to 4 hours and 5.70% patients within 4 to 6 hours. Only 1 patient (0.40%) asked for medical care 6 hours after poisoning.

**Table-VIII: Previous known psychiatric illness**

Previous known psychiatric illness	Frequency
Yes	1.10%
No	98.90%

Table (VIII) shows only 3 patients (1.10%) were known to have psychiatric illness.

**Table-IX: Known previous history of self-poisoning**

Known previous history of self-poisoning	Frequency
Yes	1.80%
No	98.20%

Table (IX) shows only 5 patients (1.80%) had previous history of self-poisoning.

**Table-X: Treatment received prior to hospital admission**

Treatment received prior to hospital admission	Frequency
Yes	77.94%
No	22.06%

Table (X) shows majority of the patients (77.94%) received treatment prior to hospital admission.

**Table-XI: Treatment providing body before hospitalization**

Treatment providing body before hospitalization	Frequency
Govt. hospital	48.40%
Private clinic	32.40%
Private physician	10.96%
Traditional healer	8.22%

Table (XI) shows nearly half of the patients (48.40%), who sought medical care before hospital admission, received medical care from govt. hospital. Rest of them consulted in private clinic (32.42%), private physician (10.96%) traditional healer (8.22%).

**Table-XII: Stomach washes of patients of poisoning**

Stomach wash of patients of poisoning	Frequency
Yes	91.50%
No	8.50%

Table (XII) shows most of the patients (91.50%) were undergone stomach wash.

**Table-XIII: Clinical features of self-poisoning cases by different pharmaceutical agents**

Clinical features	Number	%
Abdominal pain	32	11.39
Vomiting	08	2.85
Diarrhea	00	00
Bleeding manifestations	00	00
Respiratory distress	24	8.54
Scanty micturation / ceasation of micturation	00	00
<b>Symptoms</b>		
Restless	58	20.64
Drowsiness	178	63.35
Convulsion	00	00
Unconscious	10	3.56
Anaemia	45	16.01
Cyanosis	00	00
Jaundice	00	00
<b>Signs</b>		
Pulse		
Normal	114	40.57
Tachycardia	154	54.80
Bradycardia	13	4.63
Blood pressure		
Normal	253	90.03
Hypotension	28	9.97
Hypertension	00	00
Respiratory rate		
Normal	242	86.12
Hypopnoea	05	1.78
Tychnpnoea	34	12.10
Heart		
Normal heart sound	281	100
Added sound	00	00
Lungs		
Normal breath sound	272	96.80
Crepitation	08	2.85
Wheeze	01	0.36
Temperature		
Normal temp	263	93.60
Fever	18	6.40
Hypothermia	00	00
GCS		
>13	258	98.81
10-13	16	5.70
<10	07	2.50
Pupils		
Normal	259	92.20
Constricted	19	6.70
Dilated	03	1.10

Table (XIII) shows, the most common symptom was drowsiness (63.35%), followed by restlessness (20.64%), abdominal pain (11.39%), respiratory distress (2.54%), vomiting in only 8 patients (2.85%) and none of them had unconsciousness or convulsion. 45 patients (16.01%) had anaemia. Tachycardia was present in 54.8% patients. 28 patients had hypotension (9.97%). Crepitation was present in 8 patients (2.85%). 18 patients had fever (6.40%). Most of the

patients (98.81%) had GCS was > 13. 16 patients had GCS in between 10 to 13 and 7 patients had GCS below 10. 19 patients (6.70%) had constricted pupils and only 3 patients had dilated pupils.

**Table-XIV: Duration of hospital stay**

Duration of hospital stay	Frequency
1 day	89.30%
2-3 days	9.30%
>3 days	1.50%

Table (XIV) shows most of the patients (89.30%) stayed hospital only for 1 day. 9.30% patients stayed for 2 to 3 days. Only 4 patients (1.50%) stayed more than 3 days.

**Table-XV: Outcome of self-poisoning cases by pharmaceutical agents**

Outcome of self-poisoning cases by pharmaceutical agents	Frequency
Complete recovery	72.24%
Absconded	27.76%
Death	0.0%

Table (XV) shows 72.24% patients had complete recovery, 27.76% patients were absconded. None of the patients died.

## Discussion

During the period of 6 (six) months, from January 2008 to June 2008, total number of admission cases in 5 (Five) adult Medicine units of Dhaka Medical College Hospital were 11747. Of them, 1649 cases (14.05%) were due to poisoning. Out of total poisoning cases, 281 cases (17.04%) were due to self-poisoning by different pharmaceutical agents. This contributes 2.40% of total admission in all Medicine units during 6 (six) months period, which is consistent with another study<sup>34</sup> (2.60% of total admission cases). Common age groups involved in poisoning were in between 13 years to 30 years (91.81%), which is consistent with another study conducted in Francistown and Gaborone<sup>35</sup>.

Females were predominant over males (70.80% Vs 29.20%) and female to male ratio was 2.42:1 which is nearly equal to a study conducted in Piraeus, Greece, where females were 65.8% and female to male ratio was 1.92:1<sup>36</sup>. But differ with another study<sup>35</sup>, where male to female ratio was approximately equal (58:50).

Regarding marital status, 38.80% poisoning cases were married, 60.10% were unmarried and only 3 persons (1.10%) were separated. This figure is also consistent with the above mentioned study<sup>35</sup>.

Majority of the cases were students (53%), followed by house wives (24.90%), service holder (11.70%), business men (2.8%) and farmers (1.1%). The high incidence among the students reflects that they are emotionally vulnerable group and among the housewives indicates that familial instability is the underlying cause. This result differs from the study<sup>36</sup> mentioned above, where students were 14.60%, house wives were 40.60% and service holders were 15.60%.

Regarding education, those who received secondary school certificate education were more common (40.90%),

followed by those who received higher secondary school certificate education (33.10%). This result is also consistent with the study<sup>36</sup> mentioned above.

Most of the poisoning cases were from urban area (urban 84% Vs rural 16%), which is different from that of other type of poisoning<sup>33</sup>. Muslims were predominant (93.20%). Majority of the family's monthly income was between 5,000Tk to 10,000Tk.

Family disharmony (70.46%) was common background for self-poisoning. Breaking affairs (10.67%) was the next common circumstance. This differs from a study conducted in Hong Kong<sup>37</sup>.

Different drugs were used for self-poisoning. Benzodiazepines were the commonest drugs (44.10%). Next to the BDZ, common drugs were mixed drugs (16.70%), tricyclic anti-depressant agents (7.80%), other sedatives (9.60%), paracetamol (4.60%), others drugs (11%) and NSAIDs (1.40%). 4.60% drugs could not be identified. This result differs from the study<sup>34</sup> mentioned above, where barbiturates were the commonest drugs (51%) and benzodiazepines were the next common drugs (49%) used for self-poisoning.

Most of the offending drugs were collected from dispensary (89.33%). 7.47% drugs were collected from house hold members' using drugs. And most of the drugs were collected at a time (93.95%) and rest of them collected in multiple occasions (6.05%), which might indicate pre planned self-poisoning.

Nearly half of the patients (44.50%) sought medical care within 1 to 2 hours. Nearly one third patients (30.20%) within 1 hour, 19.20% patients within 2 to 4 hours and 5.70% patients within 4 to 6 hours. Only 1 patient (0.40%) asked for medical care 6 hours after poisoning.

Out of the 281 patients, only 3 patients (1.10%) were known to have psychiatric illness, which differs from the study<sup>36</sup> mentioned above, where known psychiatric illness was present in 38.3%. This may be due to low incidence of psychiatric illness or under diagnosis in our country.

Majority of the patients (77.94%) received treatment prior to hospital admission. And nearly half of the patients (48.40%), who sought medical care before hospital admission, received medical care from govt. hospital. Rest of them consulted in private clinic (32.42%), private physician (10.96%) co based practitioner (8.22%). Most of the patients (91.50%) were undergone stomach wash.

Regarding clinical feature, the most common symptom was drowsiness (63.35%), followed by restlessness (20.64%), abdominal pain (11.39%), respiratory distress (2.54%), vomiting (2.85%) and none of them had unconsciousness or convulsion. 45 patients (16.01%) had anaemia. Tachycardia was present in 54.8% patients. 28 patients had hypotension (9.97%). Crepitation was present in 8 patients (2.85%). 18 patients had fever (6.40%). Most of the patients had GCS was >13, 16 patients had GCS in between 10 to 13 and 7 patients had GCS below 10. Only 19 patients (6.70%) had constricted pupils and only 3 patients had dilated pupils.

Most of the patients (89.30%) stayed hospital only for 1 day. 9.30% patients stayed for 2 to 3 days. Only 4 patients (1.50%) stayed more than 3 days. Out of total patients, 72.24% patients had complete recovery, 27.76% patients were absconded. None of the patients died.

### Limitation of study

This was a descriptive study conducted only a period of six months. If it was conducted for long time i.e. 12 months, more patients would be included and result would be more authentic to describe the epidemiology of self-poisoning by different pharmaceutical agents. A significant number of patients were absconded. Their exact final outcome was not known. A large proportion of drugs used for self-poisoning were not recognized. Their identification might have valuable information regarding drugs used for self-poisoning. Finally, most of the patients did not undergo psychiatric evaluation. That's why this study did not ascertained exact circumstances of poisoning.

### Conclusion

In urban area, a large portion of this poisoning cases occurred by ingestion of drugs. Most of the affected cases were below 30 years old. The most important circumstances of poisoning were family disharmony and breaking of affairs. Most of the drugs were collected from dispensary without prescription.

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