

## ORIGINAL ARTICLE

# CLINICAL PROFILE AND IN-HOSPITAL OUTCOME OF ACUTE HOUSEHOLD SUBSTANCES POISONING IN A TERTIARY CARE HOSPITAL

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### Abstract

**Background:** Poisoning is an acute medical emergency. Among the thousands of harmless products available for household, very few are hazardous. Still, self-poisoning with these substances is one of the commonest mode of poisoning. This study was carried out to get information related to clinical profile and inhospital outcome of household substances poisoning in a particular area of Bangladesh.

**Methods:** This cross-sectional type of descriptive study was carried out in the department of Medicine, Sylhet M.A.G. Osmani Medical College Hospital, Sylhet, Bangladesh during the period of June 2022 to November 2022. Purposive convenient sampling was applied to recruit sample from study population. Calculated sample size was 64. Detailed history including nature of poisoning (unintentional/intentional), route of poisoning, type of poison, symptoms and signs with relevant laboratory findings were documented in a structured data collection sheet through interview from the patient or their guardians after obtaining informed written consent. In-hospital outcome in terms of survival (discharged, discharge without advice/absconded) and mortality were recorded. **Results:** Among 64 participants majority 65.63% (n=42) were female and most 56.25% (n=36) were of 18-20 years age group. Regarding educational status 96.87% (n=62) participants were educated. All of the poisoning were intentional and by oral route. Harpic was the most common agents 59.38% (n=38) used by the victims. Vomiting was the most common 81.25% (n=52) symptom and oral ulcer was the commonest 40.63% (n=26) sign. No significant abnormality of vital signs and laboratory investigations were found. Majority of the respondents 43.75% (n=28) stayed 2 days in hospital for treatment purpose. Total 85.94% (n=55) respondents were discharged with advice and 14.06% (n=9) respondents left hospital without medical advice. No death was documented in this study. **Conclusion:** Young teenaged female patients were the majority of victims in our study reflecting the degree of powerlessness and hopelessness of young, educated people with unemployment and difficulties in coping with life stressors.

**Keywords:** Clinical profile, Acute Poisoning, Household substances, In-hospital outcome.

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### Introduction:

The pattern of poisoning varies from country to country and region to region depending on factors like geography, availability or accessibility of poison, socio-economic conditions, cultural and religious influences.<sup>1</sup> Among the thousands of harmless products available

as household, very few are hazardous. Still, poisoning with these substances is one of the common modes of poisoning all around the world as well as in South Asia.<sup>2</sup> Some commonly encountered poisonous substance in household are detergents (bleaching agents, floor cleaner, laundry detergents), solvents

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(kerosene, thinner), automotive products (petrol, brake fluid, battery water), cosmetics and personal care (soaps, shampoo, nail polish) as well as other household products (mothball, button battery) etc.<sup>3</sup>

The pathology of poisoning depends on the route of exposure and absorption of the poison into the body. Most cases of household poisoning occur through oral ingestion leading to corrosive effects in the alimentary system along with systemic toxicity.<sup>4</sup> Direct contact to the skin or eye may cause damage to the contact area. Mortality is most often caused by tracheal necrosis and perforation of the esophagus or stomach, followed by mediastinitis or peritonitis.<sup>5</sup> Baseline survey in Bangladesh showed household products are responsible for around 20.6% acute poisoning cases.<sup>6</sup> Patil et al. found household products as the most common agent of poisoning in an urban setting of India.<sup>2</sup> A study done in Dhaka medical college by Khokan et al. showed 7.76% of poisoning was due to household substances.<sup>7</sup> But meta-analysis of global data on household poisoning is still missing, though there are a considerable number of regional evidence.

Self-poisoning is one of the commonest acute medical presentations. It is therefore vital that poison prevention authorities are well informed regarding patterns of poisoning, clinical profiles of poisons and outcome of several household poisons to plan effective preventive strategies and treatment modalities.<sup>8</sup> So, knowledge regarding clinical features, complications and geographical variations of different poison is necessary to treat the patient, specifically household substances poisoning. This study was carried out to get information related to clinical profile and pattern of household substances poisoning in a particular area of Bangladesh.

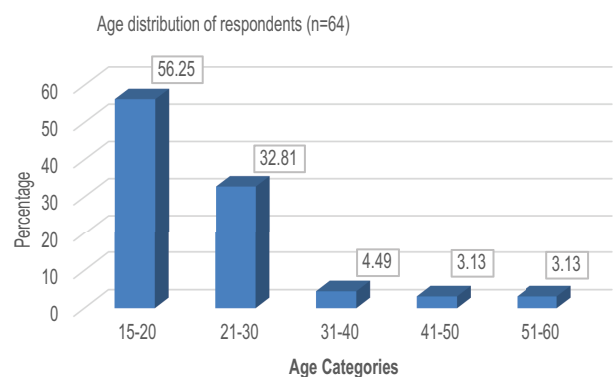
#### Methods:

This cross-sectional type of descriptive study was carried out on admitted patients with acute household substance poisoning in the department of Medicine, Sylhet M.A.G. Osmani Medical College Hospital, Sylhet, Bangladesh during the period of June 2022 to November 2022. Those who fulfilled the inclusion criteria and did not have exclusion criteria were recruited as the study sample. Purposive convenient sampling was applied to recruit sample. Sample size was calculated using Cochran's formula considering 95% level of significance and 10% precision level (marginal error). Calculated sample size was 64. The subjects were thoroughly informed about the aims, objectives and detail procedure of the study before enrolment. An informed written consent was taken from each participants or their guardians. Detailed history including nature of poisoning (unintentional/

intentional), route of poisoning, type of poison, symptoms and signs with relevant laboratory findings were documented in a structured data collection sheet through interview of the patient or their guardians. In-hospital outcome in terms of survival (discharged, discharge without advice/absconded) and mortality were recorded. All respondents got standard hospital care after diagnosis of the particular poisoning. Data entry and analysis was done using Microsoft excel and SPSS for windows version 22.0 respectively. Data were presented as the proportion of valid cases for discrete variables and as means  $\pm$  standard deviations. Differences in baseline characteristics were compared using the student t-test. A 'p' value less than 0.05 was considered significant.

#### Results:

Among 64 participants majority were female 65.63% (n=42) followed by male 34.38% (n=22). Mean age of female and male were  $21.83 \pm 6.31$  and  $26.95 \pm 10.83$  respectively (p value=0.0197). Of the participants 43.75% (n=28) were married, 53.13% (n=34) were unmarried, 1.56% (n=1) was separated and 1.56% (n=1) was divorced. Regarding educational status most of the respondents were below SSC 40.63% (n=26), followed by SSC passed 32.81% (n=21), HSC passed 20.31% (n=13), graduate 3.13% (n=2), and illiterate 3.13% (n=2). Most of the participants were unemployed 37.50% (n=24), followed by housewife 32.81% (n=21), non-government employee 12.50% (n=8) and businessman 4.69% (n=3). The majority 84.38% (n=54) of the respondents lived in rural areas and rest 15.66% (n=10) were found to be living in urban areas. Among all participants 87.50% (n=56) had no co-morbidity but Pregnancy, Bronchial asthma, Hypertension, COPD, Diabetes mellitus were found in 4.69% (n=3), 3.13% (n=2), 1.56% (n=1), 1.56% (n=1) and 1.56% (n=1) patients respectively. Regarding mode of poisoning all 100% (n=64) cases were intentional and route was oral. Results are shown in diagram-1 and table: I-VII.



**Diagram-1** : Age distribution of respondents (n=64)

**Table-I**  
*Type of poisoning (n=64)*

Causes Of Poisoning	Number of Respondents	Percentage (%)
Rodenticides (aluminium phosphide, zinc phosphide)	10	15.63
Ant killer (Dimethyl parathion)	1	1.56
Oleander seeds	1	1.56
Harpic	38	59.38
Mosquito repellents(Pyrethroids)	3	4.69
Terpene oil	2	3.13
Soap	1	1.56
Corrosive other than harpic	6	9.36
Kerosene	2	3.13
Total	n=64	100%

**Table-II**  
*Interval between poisoning and presentation (hours) (n=64)*

Interval between poisoning and presentation	Number of Respondents	Percentage (%)
0-1 hour	6	9.38
1-2 hours	21	32.81
2-3 hours	13	20.31
4-6 hours	14	21.88
More than 6 hours	10	15.63
Total	n=64	100%

**Table-III**  
*Clinical symptoms and signs of poisoning patient (n=64)*

Clinical Presentations	Number of Respondents	Percentage (%)
Vomiting	52	81.25
Salivation	8	12.50
Diarrhoea	6	9.38
Abdominal Pain	5	7.81
Cough	1	1.56
Fever	1	1.56
Oral Sore	26	40.63
Dysphagia	23	35.94
Palpitation	1	1.56
Mydriasis	1	1.56
Crepitations of lungs	4	6.25
Tachypnea	4	6.25
Fever	1	1.56
Oral ulcer	26	40.63

**Table-IV**  
*Distribution of vital signs (n=64)*

Clinical characteristics	Mean ± SD	Min	Max
Pulse (bpm)	88.25 10.56	60	112
SpO2 (%)	98.22 1.44	93	100
Respiratory rate (breaths/min)	14.62 2.82	12	26
Temperature (°F)	98.23 2.12	96	102
Systolic blood pressure	112.97 15.4	80	160
Diastolic blood pressure	72.39 9.4	50	100

**Table-V**  
*Investigations results of the respondents (n=64)*

Investigation Name	Number of investigations done (n=64)	Result of investigations	
		Normal	Abnormal
CBC	52	52	0
Blood Sugar (Random)	62	62	0
Urine R/M/E	52	52	0
S. Electrolytes	41	41	0
S. Creatinine	41	41	0
Chest X-Ray	50	50	0
ECG	62	62	0
SGPT	10	10	0

**Table-VI**  
*Duration of hospital stay (days) (n=64)*

Duration of hospital stay (days)	Frequency (Number of respondents)	Percentage (%)	Mean ± SD (Duration of hospital stay)
1	25	39.06	1.875 ± 0.968
2	28	43.75	
3	7	10.94	
4	3	4.69	
6	1	1.56	
Total	n=64	100%	

**Table-VII**  
*Distribution of outcome (n=64)*

Outcomes	Number of Respondents	Percentage (%)
Survival	55	85.94
Discharged without advice	9	14.06
Death	0	0%
Total	n=64	100%

### Discussion:

We enrolled 64 patients of household substances poisoning admitted in medicine department of Sylhet MAG Osmani medical college hospital from June 2022 to November 2022. Total 88 patients were admitted with the complaints of poisoning with different household substances during study period, among whom 64 patients were enrolled and remaining excluded according to criteria. It was found that the most common age group to attempt household substances poisoning is the young age group that is between 18-20 years 56.25% (n=36), followed by 21-30 years 32.81% (n=21) (Diagram-1). This result was similar to a previous study from other parts of Bangladesh.<sup>9</sup>In another Bangladeshi study it was shown that 68.2% respondent's age were between 16-28 years.<sup>10</sup> Another study done in India showed that nearly 65% of the study population were in the age group of 15-25 years, while 25% of the study population was in the age group of 26-44 years.<sup>11</sup>High rate of poisoning with household substances in this economically active age group would have direct and indirect effects on the family as well as in the community both socially and economically.

Females attempted more with household substances poisoning 65.63% (n=42) when compared with the males 34.37% (n=22) and female to male ratio was 1.9:1 (p value= 0.0197). Unmarried cases were leading

53.13% (n=34) followed by married cases 43.75% (n=28). These findings were also consistent with other studies.<sup>10</sup>This might reflect the lack of cope up ability of this group to social stress.

Significant proportion of the respondents were unemployed 37.50% (n=24) followed by housewife 32.81% (n=21), non-government employee 12.50% (n=8) and businessman 4.69% (n=3). The high incidence of household substances poisoning among the unemployed people reflects that they are financially unstable group and among the housewife indicates that familial instability is the underlying cause.<sup>12</sup>

Regarding educational status, most of the respondents were below SSC 40.63% (n=26) followed by SSC passed 32.81% (n=21). HSC passed respondents was 20.31% (n=13), graduate and above were 3.13% (n=2). But illiteracy was found in only 3.13% (n=2) respondent. So, poisoning with household substances are increasing in teenage group who are studying in high school and college. These group of people are emotionally vulnerable. This is similar to study by Camidge et al.<sup>13</sup> This finding is also consistent with the study of Ahmed et al where suicidal and homicidal poisoning were common in educated group and accidental poisoning was common in non-educated group.<sup>14</sup>

The majority of the respondents 84.38% (n=54) were from rural areas and rest 15.66% (n=10) were from urban areas. Similar result were observed in many other studies done in Bangladesh and in south Asia.<sup>14,15</sup> But this is not similar to a study done in Dhaka Medical College Hospital by Khokon et al.<sup>7</sup>This may be due to the fact that household substances used for self-poisoning are widely available both at rural and urban areas of Bangladesh.

Regarding mode of poisoning in our study subjects all were by oral route and all were intentional. Harpic is a common household cleaning staff mainly composed

of 10% Hydrochloric acid with a pH of 0.5 and it is commonly abused by women.<sup>15</sup> According to our study findings toilet cleaning agent (Harpic) ingestion was the most common household product used for poisoning accounting for 59.38% (n=38) of all cases (n=64). Rodenticides were the second leading type 15.63% (n=10), followed by corrosives other than Harpic 9.36% (n=6), Mosquito repellents-Pyrethroids 4.69% (n=3), Kerosene 3.13% (n=2), Terpene oil 3.13% (n=2), Ant killer (dimethyl parathion) 1.56% (n=1), Oleander seeds 1.56% (n=1) and Soap 1.56% (n=1) (Table-I). Similar pattern were also observed in studies of other developing countries.<sup>16,17</sup>

Most of the patient presented with history of vomiting 81.25% (n=52), followed by oral ulcer 40.63% (n=26), dysphagia 35.9% (n=23), salivation 12.50% (n=8), abdominal pain 7.81% (n=5), diarrhea 9.38% (n=6), fever 1.56% (n=1), cough 1.56% (n=1) and palpitation 1.56% (n=1) (Table-III). No patient suffered from aspiration pneumonia, respiratory distress, ARDS, shock, acidosis, coma or with seizure in presentation in our study. So gastrointestinal symptoms were the predominant symptoms in our study. But Khokan et al. found 6 patient of 128 patient presenting with respiratory distress.<sup>7</sup> Chan TYK et al. found serious complication like aspiration pneumonia, ARDS due to aspiration of Dettol directly or following gastric lavage into airway.<sup>18</sup>

In acute household substances poisoning duration of hospital stay is low in comparison to other pesticides and pharmaceuticals poisoning. In this study the mean duration of hospital stay was  $1.88 \pm 0.96$  days. Highest 6 days of hospital stay was found in 1.56% (n=1) respondents. Most of the patient got discharge from hospital within 24-48 hours of their admission (Table-VI). This finding is similar with previous studies.<sup>19</sup>

Most of the patients in this study was found to be in younger age group. Co-morbid conditions like HTN, DM, COPD etc. are less common in young age. So most of the respondents in our study were without any such co-morbid conditions. Complications with household substances depends upon type and amount of poison intake in both healthy and co-morbid patients.<sup>20</sup> But in our study 4.69% (n=3) patients were pregnant where no major complications were seen during hospital stay. This may be due to less amount intake of corrosive and other household substances poisons.

Regarding outcome, during the study period no death was found in hospital. Most of the respondents 85.94% (n=55), were discharged with medical advice and 14.06% (n=9) respondents left hospital without medical advice or absconded (Table-VII). These findings correlate with the study done by TYK Chan et al. where

hospital mortality were found low in comparison to other type of poisoning.<sup>14</sup> In Bangladesh similar findings were found in a study of Dhaka Medical College Hospital.<sup>7</sup>

#### **Conclusion:**

Attempted suicide or accidental poisoning with household substances is a major public health problem to be addressed like any other medical condition. Household substances poisoning has an increasing trend as these are easily available. It commonly affects the young productive age group most of whom are unemployed and dependent on other family members. This seems to reflect the degree of powerlessness and hopelessness of young, educated people with unemployment and difficulties in coping with life stressors. Harpic followed by Rodenticides were found to be the most common household agent used for self-poisoning. For this reason gastrointestinal symptoms and signs were predominant at presentation. Early recognition of the clinical features with prompt action to poisoning patient can save catastrophic complications. As there is no national guideline regarding management of household substances poisoning, so management varies with individual to institutes. People should be aware regarding poisoning prevention, first aid measurement and early hospital admission of poisoned patient.

#### **Limitations of the study:**

This was a cross-sectional and single centered hospital-based study, so the actual magnitude of the problem may not be reflected in the results. Toxicological analysis could not be performed due to lack of facility and nature of the study. Another major limitation of the study is the lack of follow-up of the subjects after their discharge from the hospital.

#### **Conflict of interest:**

The authors stated that there is no conflict of interest in this study.

#### **Funding:**

No specific funding was received for this study.

#### **Ethical consideration:**

The study was conducted after approval from institutional ethical review committee. The confidentiality and anonymity of the participants were maintained.

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