

# DEMOGRAPHIC CHARACTERISTICS AND PATTERN OF ACUTE POISONING IN RANGPUR MEDICAL COLLEGE HOSPITAL

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## Abstract:

**Background:** Acute poisoning is a major public health problem in low and middle income countries. The agents vary from country to country depending on easy availability of the poison, socio-economic condition and educational background of the people. The study was done to see the pattern, outcome and etiological aspect of different acute poisoning.

**Methods:** It was a descriptive and cross sectional study carried out in the department of Medicine, Rangpur medical college hospital from 1<sup>st</sup> December 2010 to 30<sup>th</sup> November, 2011.

**Results:** During the study period a total of 956 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 acute poisoning, house-wives were the maximum (33.6%) followed by farmers (31.7%) (P value 0.000). 89% cases were suicidal, 5% accidental, 5% stupefying and only 1% cases were homicidal (P value 0.000). Familial disharmony was the prime cause (92.3%) of suicidal motive. OPC was the most common agent (73.5%) that was used in acute poisoning. 88% of the patients were survived and 5% died.

**Conclusion:** Acute poisoning is an important health care problem in our country. Improved awareness, restricting availability of drugs without prescription and banning more toxic organophosphorus compounds will reduce the incidence of acute poisoning.

**Keywords:** acute poisoning, disharmony, stupefying, suicide

## Introduction:

Acute poisoning is exposure to a poison on one occasion or during a short period of time and has become a major public health problem worldwide, following the intensification of agriculture and the promotion of agrochemicals in low and middle income countries<sup>1</sup>. Acute poisoning in our country is common. Study showed poisoning is a common method of suicide, especially in the developing countries<sup>2</sup>. In China and South-east Asia pesticides account for about 300000 suicides each year<sup>3</sup>. Another study suggested that each year worldwide there is 3 million acute poisoning with 2, 20,000 deaths.<sup>4</sup> Much of this burden is borne by developing countries where more than 80% of cases are fatal pesticide poisoning related hospitalization<sup>5</sup>. 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<sup>6</sup>. Among different types of poisoning, self poisoning is most common. The nature of this poisoning may be suicidal, stupefying, accidental or as a manifestation of deliberate self harm<sup>7</sup>. In Bangladesh poisoning is an important health problem causing around 2000 deaths per year<sup>8</sup>. Self poisoning constitutes more than half of the total poisoning cases admitted in hospital<sup>9</sup>. In acute poisoning pesticide and herbicide are most commonly used. Other agents include rodenticides like rat killer poison, sedative and hypnotics drugs, common household chemicals like harpic, dettol, dishwashing liquid, cosmetics like hair remover, acid and caustic agents. Suicidal attempts is the most common cause.<sup>10, 11</sup> Acute poisoning is a potentially serious

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problem and sometimes disgusting for both hospital staff and family members. It causes considerable mortality and morbidity. As clinicians in hospital practice have to deal with this very common medical problem, a clear idea is needed regarding presentation, most common etiological agents background factors and outcome of these cases. The aim of this study is to focus on different etiological aspect of this very urgent medical emergency.

#### Materials and Methods:

It was a descriptive and cross sectional study carried out in the department of Medicine, Rangpur Medical College Hospital, Rangpur. Patients presented with history of acute poisoning were prospectively included in this study over one year (1<sup>st</sup> of December, 2010 to 30<sup>th</sup> November, 2011). Patients of both sexes and above 18 years were taken. Diagnoses were made on history and clinical syndrome of respective poisoning following national poisoning management guideline of Bangladesh. Data were collected using a structured questionnaire. To see the types of different acute poisoning, the outcome of different acute poisoning and aetiological aspect of acute poisoning was precisely observed

Patients were treated following national poisoning management guideline without any hamper for this study purpose. In case of seriously ill cases some information were collected from patient's attendant. The study was explained a head to the patients and informed written consent were taken from them or their legal guardian. Ethical permission was taken from local ethical committee of Rangpur Medical College. Data were analyzed using SPSS 15 software and descriptive statistics were presented using percentage and proportion. Level of significance (p value) was determined using chi square and independent sample t test. The level of significance is 0.05 and p-value <0.05 was considered significant. The study did not involve any additional investigation or procedures and significant risk or economic burden to the patients.

#### Results:

During the study period a total of 956 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=956)*

Variable	Frequency	Percent	P value *
<b>Age</b>			
18-40 years	879	91.9%	0.000 <sup>s</sup>
41-60 years	67	7%	
>60 years	10	1%	
<b>Sex</b>			
Male	493	51.6%	.332 <sup>ns</sup>
Female	463	48.4%	
<b>Marital status</b>			
Married	682	71.45%	
Unmarried	274	28.55%	0.000 <sup>s</sup>
<b>Educational status</b>			
Primary	341	35.7%	
Secondary	457	47.8%	
Higher secondary	103	10.8%	0.000 <sup>s</sup>
Graduate and above	55	5.75%	
Illiterate	24	2.5%	
<b>Occupation</b>			
Service	31	3.2%	
Farmer	303	31.7%	
Student	200	20.9%	0.000
Housewife	321	33.6%	
Business	73	7.65%	
Others	28	2.9%	
<b>Residence</b>			
Rural	648	67.8%	
Urban	308	32.2%	0.000

\*Chi square test was done to see the significance of difference. (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 acute 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 acute poisoning.

**Table II**  
*Showing motive of acute poisoning (n=956)*

Variable	Frequency	Percent	P value*
Suicidal	843	88.17%	0.000 <sup>s</sup>
Homicidal	10	1.04%	
Stupefying	53	5.54%	
Accidental	50	5.2%	

\*Chisquare test was done to see the significance of difference. (S= significant)

Stupefying cases occurred while travelling and the poison was mixed with different foods, drinks etc. Accidental poisoning cases occurred during spraying in the field (50%), poison bottle mistakenly taken as the medicine syrup (30%), after using lice killer in hair (16%) and in some cases patient suffering from psychiatric illness accidentally took the drugs (4%). Suicidal tendency was more in male (53.01%) than female (46.99%) and maximum (811) of them are 18-40 years age group. Table III showing the causes of suicidal attempt.

**Table III**

*Showing causes of suicidal motive (n=843)*

Variable	Frequency	Percent	P value*
Familial disharmony	778	92.3%	0.000 <sup>s</sup>
Failed in examination	17	2.1%	
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)

OPC (73.5%) was the principal type of poison that the patients took for acute poisoning (Table IV), drugs (12.3%) was second to OPC; some corrosive (5.5%) agents like dettol, herpic, nitric acid, hair dye were used by some patient. Sedatives that were used include diazepam, bromazepam, midazolam and clonazepam. Among other drugs anti psychotics, TCA, paracetamol, cetirizine were taken by the patient.

**Table IV**

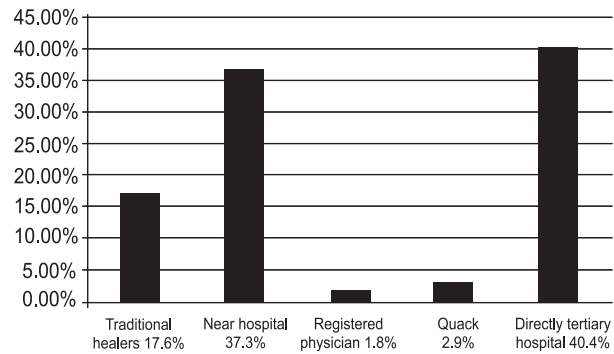
*Distribution of types of poison used in acute poisoning (n=956)*

Variable	Frequency	Percent	P value*
OPC	703	73.5%	0.000 <sup>s</sup>
Drugs	118	12.3%	
Unknown	72	7.5%	
Corrosive	53	5.5%	
Others	10	1%	

\*Chisquare test was done to see the significance of difference. (S= significant)

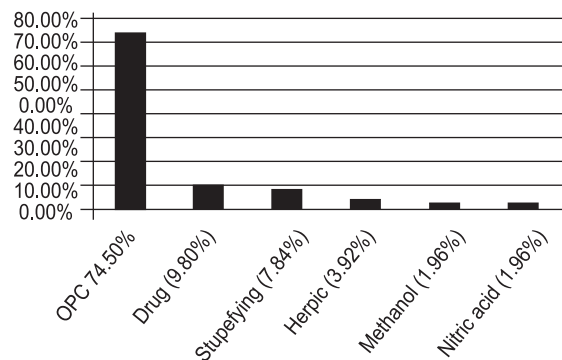
Pre-hospital treatments of the poisoning cases were attempted to induce vomiting by applying bitter or dirty things in mouth. Figure I showing management strategy before reaching tertiary hospital.

Demographic Characteristics and Pattern of Acute Poisoning



**Fig.-I:** showing prehospital management strategy after acute poisoning (P value 0.000<sup>s</sup>)

Gastric lavage was given in all the 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 52.94% were male and 47.05% were female; 74.50% from rural areas and 25.50% from urban areas. Maximum patient died due to OPC poisoning (74.50%) and minimum was methanol (1.96%) and nitric acid poisoning (1.96%) (Figure II), no patient died due to dettol, savlon, dish wash poisoning.



**Fig.-2:** showing distribution of different types of poison in death cases Hospital stay of 1-2 days was in 77.8%, only 1.7% patients remained admitted in hospital for >5 days.

**Discussion**

Acute poisoning is an important medical emergency. The nature of poison used varies in different parts of the world and may vary even in different parts of the same country depending on the socioeconomic factors and cultural diversity. Management of these critically ill patients will greatly improve if the common causes of poisoning are properly defined<sup>12</sup>. In this study male was slightly higher than the female 1.064:1, Males dominated in a study done in tertiary care hospital in Karnataka, India where male to female<sup>13</sup> ratio was 3:1. However, some other studies have shown that males are marginally higher compared to females.<sup>14,15</sup>

A similar picture was found in another study by Rahaman MM, Khan GK, et al. where male female ratio was 1.6:1<sup>9</sup>. 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<sup>13</sup>. Similar findings were observed in other studies.<sup>14, 16</sup> Married people (71.3%) were observed more than unmarried in acute poisoning in this study. A study on 2003 in rural India also showed that 63% victims of acute poisoning were married<sup>17</sup>. 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.<sup>18</sup>

Motive of poisoning in this study was suicidal (88.2%), in another study it was 78.78%<sup>9</sup>. Maximum reported cause of suicidal attempt was familial disharmony (92.3%). Male sex, age group between 18-40 and patients from rural area were more involve in suicidal attempt. OPC (73.5%) was the principal type of poison that the patients took for acute poisoning. The WHO reports that pesticides are now the most common method of suicide worldwide.<sup>19</sup> One study showed over half of all hospital admissions for self-harm to a General Hospital in Rio de Janeiro had taken pesticides.<sup>20</sup> Drugs was used in acute poisoning in 12.3% of cases, among the drugs diazepam, clonazepam, midazolam, paracetamol, amitriptylline and mixed drugs was taken. As drugs are cheap and easily available in the market without prescription from authorized person those were used in acute poisoning. Unknown agents used in street poisoning also found in 7.5% cases. Corrosives poisoning were in 5.5% cases and others were 1%. Another study showed that OPC were used in 82.45% of cases followed by diazepam 8.98%, datura 1.99%, acid 0.58% and others 2.43% cases<sup>11</sup>. Mortality rate was 5.3%, death were mostly due to OPC poisoning (38 cases) 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.<sup>11</sup> Low mortality rate in this study probably was due to increased awareness of the people, improvement of health facilities and treatment modalities. 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 acute poisoning patients. Hospitals facilities, logistics and staffs could not cope with such type of huge number patients.

### Recommendation

1. Pesticide regulatory policies should be reviewed.
2. Provide training in the safe handling of pesticides and identification and management of pesticide poisoning at different sectors and levels.
3. Develop or strengthen community programmes that minimize risks of intentional and unintentional pesticide poisoning.
4. An expert team of healthcare professionals including doctors, nurses and paramedics can be built up.
5. A specialized separate unit can be set up in medical college hospital for proper management of poisoning cases.
6. Acute poisoning cases should be managed with sympathy and health care professionals need to support them humanly.

**Limitations of the study:** Unable to detect serum level of different poisons and failed to determine the chemical nature of the stupefying or unknown poisons. Factors to determine the outcome of acute poisoning was not also observed in this study due to absence of long follow up in poisoning cases.

### Conclusion

Acute poisoning is an important health care problem in our country. OPC was the principal agent that was used in acute poisoning. To prevent stupefying poisoning people should be conscious during journey and in public gathering. If proper awareness develops among people about toxic substances and clearly labeling of poisons, accidental poisoning may prevent. Improved awareness, restricting availability of drugs without prescription and banning more toxic organophosphorus compounds will reduce the incidence of acute poisoning.

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## BJM Vol. 23 No. 2

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## Demographic Characteristics and Pattern of Acute Poisoning

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