A Study on Pattern of Poisoning Cases and their Outcome in a Tertiary Level Hospital in Cumilla, Bangladesh

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Abstract

Background: Poisoning is a major public health problem worldwide, with thousands of deaths occurring every year, mainly in the developing countries. It is a common medico-social problem in Bangladesh causing around 300,000 episodes and around 2000 deaths per year. The common patterns of poisoning in our country are suicidal, homicidal/criminal and accidental. This study was done to assess the clinico-epidemiological pattern of poisoning cases and their outcome in Cumilla Medical College Hospital.

Methods: It was a descriptive cross sectional study carried out in the Department of Medicine, Cumilla Medical College Hospital from June 2019 to December 2019 which included 860 poisoning casesadmitted to Medicine Units. All suspected cases of poisoning admitted through emergency and outdoor admission were initially screened by study physician, detailed history and clinical examination were done in all enrolled cases. Diagnosis was made on the basis of patients' statement, statement of the witness, smell of poisoning agents, brought specimen

Results: Among them approximately 61% patients were female and 39% were male. The age of the patients ranged from 13 to 95 years with a mean±SD age of 26.12±11.8 years. Almost identical representation of the study population from rural (80%) and urban (20%) areas was noted. Less than one-fourth of the patients were illiterate. There was a wide representation of various occupations among study population. Marital status shows that highest number 564 (65.58%) of the patients were married. Most of the affected people (77.09%) were between 15-30 years age group. The major types of poisonings included OPC (20.70%), sedatives (18.26%), drug overdose (11.51%), insecticides (9.77%), corrosives (8.95%), street poison (8.37%) and unknown poison (7.33). Some miscellaneous causes of poisonings were some chemical agents (Aluminium phosphide, Alcohol etc.), herbicides, pesticides, poisonous plants (Dhatura & Cannabis), antidepressant, acid, kerosene and tarpine oil. In this analysis, we had found that most cases (80.47%) were committed to suicidal intention due to family disharmony, whereas females were significantly (68.50%) more than males. Other cases were committed to suicidal intention due to breaking affair, economic loss and fail to pass exam. The mean hospital stay was 3.08±1.55 days. In case of majority of the cases the number of days stayed at the hospital was two or three days. Our study outcome reveals that 70.47% patients have been discharged after complete recovery from poisoning, whereas only 6.86% patients have been referred for better management. Only 2.21% patients died and the death of the patient was due to late admission to hospital after suicidal attempt. Some of the patients (2.44%) were discharged on risk bond (DORB) and some (11.98%) were discharged on request. Only a few patients (6.05%) absconded from hospital.

Conclusion: Poisoning is one of the most important reasons for emergency admission in the hospital. The pattern and magnitude of poisoning are thus multidimensional and demanding multi-sectoral approach for facing the problem.

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Introduction

Poisoning is a common medico-social problem nowadays all over the world. It consumes not only the valuable health service resources but also cause considerable morbidity and mortality.[1] Poisoning constitutes a major cause of hospitalization and mortality in developed as well as developing nations. The severity and outcome in such cases are determined by a number of factors such as chemical and physical properties of the poison, amount consumed, mode of poisoning and individual characteristics like the functional reserve of the individual or target organ, which is further influenced by age and pre-existing disease. Among the various causes of poisonings, pesticides are the most common cause of self-poisoning worldwide,[2,3,4] with the proportion ranging from 4% in the European region to over 50% in the Western Pacific region.[5] Approximately 258,000 fatal cases of pesticide self-poisoning are reported globally each year,[5] most from Asia, and the figure are greatly exceeded by the number of poisoned patients who seek treatment at health facilities. Data about the other kinds of poisonings are limited and are quite variable depending on the geographical area, socioeconomic factors and cultural diversity.[6,7,8,910]

In our country it causes around 300,000 episodes and around 2000 death per year.[1] In the United States of America exposure to xenobiotics results in over 5 million request for medical advice and treatment each year and is the fourth most common cause of accidental death with the reported mortality is over 5000 per year.[11, 12] In the United Kingdom it accounts for 13-20% of all medical emergency admission to hospital.[13] A world wide analysis of acute intoxications was attempted trying to weight their medical and economic burden and the toll for acute poisoning in terms of morbidity and mortality. The natural history of acute intoxications reveals two common patterns, such as the increase in number and the changing profile of acute poisoning.[14, 15] The number of poisoning cases is increasing in our country day by day. The common patterns of poisoning in our country are suicidal, homicidal / criminal and accidental. The incidence, nature, etiology, age group affected and the outcome of poisoning in our country is different from that of the western world. [14, 16]

The poisoning agents involved in our country are different because of the social structure, economic status, educational level, awareness of our people and availability of drugs are different from that of the western countries.[17] Few studies done previously in our country shown that, the causes of poisoning in our country are lack of education, frustration, familial disharmony, failure of love affairs, failure in the examination and the availability of the poison. Common poisoning in our country are organophosphorous compound and street poisoning with ultra short acting sedative-hypnotics.[18, 19]

However pattern of poisoning and motive behind poisoning might have changed over the years, which needs further study. Such will help management and prevent poisoning in our country. The huge burden of poisoning cases demand comprehensive strategies for reducing deaths. Hence, this prospective observational study was conducted with an aim to identify factors related to outcomes in such cases and to suggest strategies to reduce associated morbidity and mortality.

Methods

It was an observational cross sectional study carried on the Department of Medicine, Cumilla Medical College Hospital, Cumilla, Bangladesh from June 2019 to December 2019

Inclusion criteria:

1. All the suspected poisoning cases admitted in medicine units of Cumilla Medical College Hospital, Cumilla were included in this study. A total 860 cases were studied.
2. Age more than 13 years
3. Patient or patient's attendant who gave consent.

Exclusion criteria:

1. Snake bite, food poisoning and electrocution, near drowning, drug reaction are not included in this study.
2. Patients with co-morbid conditions including metabolic causes and structural brain related causes were excluded.
3. Unwilling to give informed consent by patient or patients relatives.

Patients admitted as suspected cases of poisoning through emergency and outdoor admission were initially screened by study physician. After doing the exclusion criteria detailed history and clinical examination were done in all enrolled cases. Diagnosis was made on the basis of patients' statement, statement of the witness, smell of poisoning agents, brought specimen and characteristic features of poisoning in majority of cases (clusters of syndrome). Relevant investigations like RBS, CBC, SGPT, Serum Bilirubin, Prothrombin time, Blood Urea, Serum Creatinine, X-ray Chest was done to exclude other possibilities and to see the prognosis. Those having relevant investigation confirming other metabolic or structural causes were not included in the study and not analyzed therefore. All the data collected in data sheet. Informed written consent from the patient when conscious and from attendant when unconscious were taken before enrollment.

Results

Over a period of 6 months, total 12783 Patients were admitted in the Medicine ward of Cumilla Medical College Hospital, among them 1112 patient were admitted due to poisoning which is about 8.6% 0f total admission. Out of 1112 cases, 860 cases were included in this study. Approximately 61% patients were female and 39% were male. The age of the patients ranged from 13 to 95 years with a mean±SD age of 26.12±11.8 years. Almost identical representation of the study population from urban and rural areas was noted. Less than one-fourth of the patients were illiterate. There was a wide representation of various occupations among study population. Marital status shows that highest number 564 (65.58%) of the patients were married (Table I).

Most of the affected people (77.09%) were between 15-30 years age group (Table II).

The distribution of various poisoning cases in the studied population is depicted in figure 1.

The major types of poisonings included OPC (20.70%), Sedatives (18.26%), drug overdose (11.51%), insecticides (9.77%), corrosives (8.95%), Street poison (8.37%) and unknown poison (7.33). Some miscellaneous causes of poisonings included some chemical agents (Alluminium phosphide, Alcohol etc.), herbicides, pesticides, poisonous plants (Datura& Cannabis), antidepressant, acid, kerosene and tarpine oil (figure 1).

Table I: Demographic profile of the patients presenting with Poisoning

Demographic Profile	
Age, mean ± SD	26.12±11.8
Male/female, n (%)	337 (39.19)/523 (60.81)
Married/Unmarried, n (%)	564 (65.58)/296 (34.42)
Residence, n (%)	
Rural	688 (80)
Urban	172 (20)
Qualification, n (%)	
Illiterate	106 (12.33)
Primary	126 (14.65)
High School	375 (43.60)
Intermediate	214 (24.88)
Graduate	39 (4.54)
Occupation, n (%)	
Business	52 (6.05)
Farmer	64 (7.44)
Garments worker	15 (1.74)
Government employee	4 (0.47)
Housewife	346 (40.23)
Laborer	32 (3.72)
Others	92 (10.70)
Student	255 (29.65)

SD: standard deviation

Table II: Age distribution of poisoning

Age distribution of poisoning		
Age range in years	Number of patients	%
15-30	663	77.09
31-45	129	15
46-60	57	6.62
61-75	9	1.05
76-90	1	0.12
91-105	1	0.12

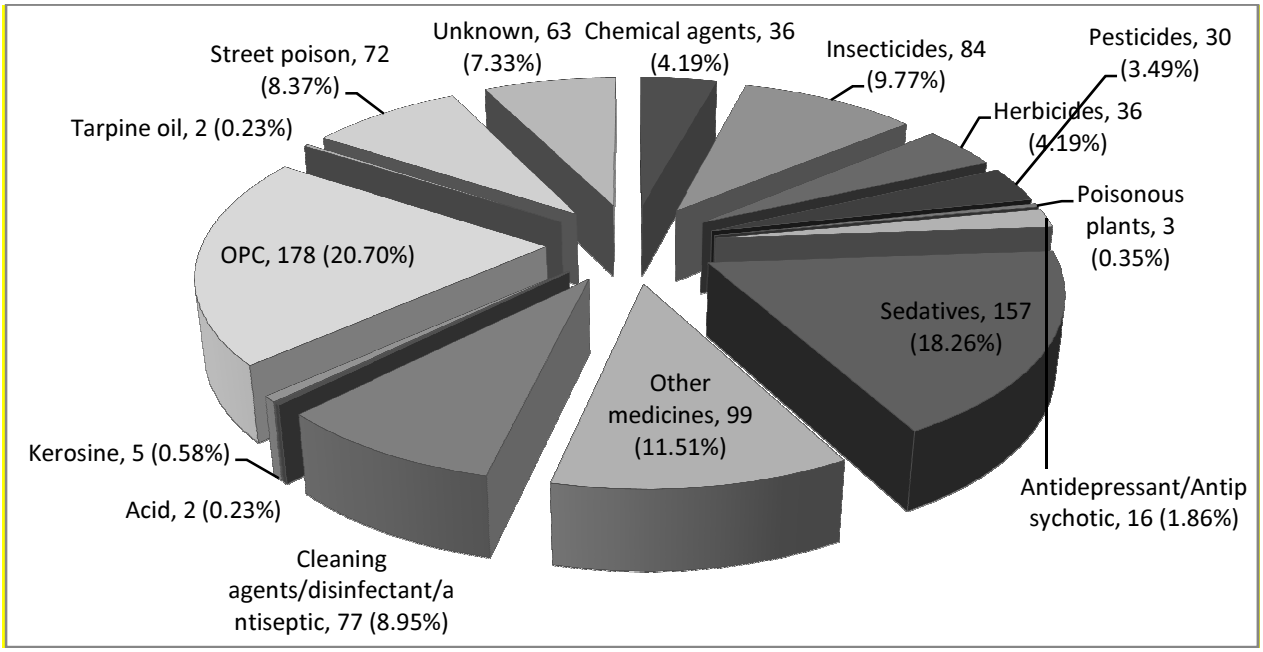

Figure 1. Types of poisoning cases

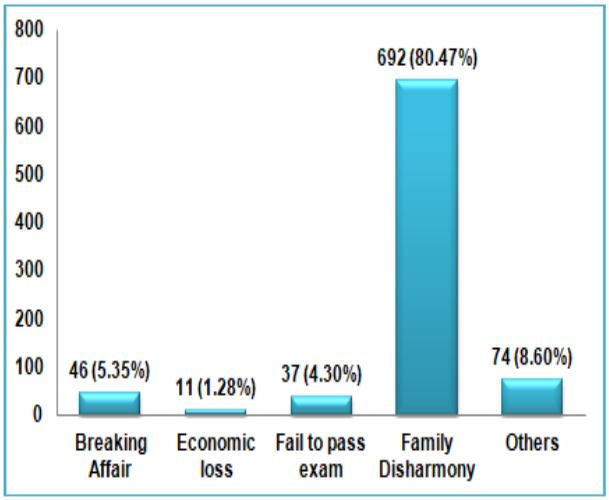

Figure 2. Intention of poisoning

The hospital stay of the admitted patients with poisoning ranged from one to ten days. The mean hospital stay was 3.08±1.55 days. In case of majority of the cases the number of days stayed at the hospital was two or three days (figure 2).

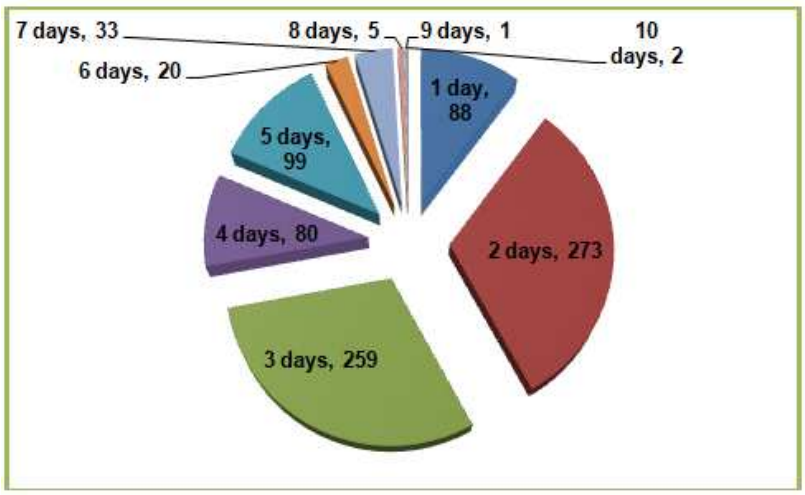

Figure 3. Distribution of the cases on the basis of number of days stayed at the hospital.

Our study outcome reveals that 70.47% patients have been discharged after complete recovery from poisoning, whereas only 6.86% patients have been referred for better management to Dhaka Medical College Hospital. Only 2.21% patients died and the death of the patient was due to late admission to hospital after suicidal attempt with. Some of the patients (2.44%) were discharged on risk bond (DORB) and some (11.98%) were discharged on request. Only a few patients (6.05%) absconded from hospital. (Table 4)

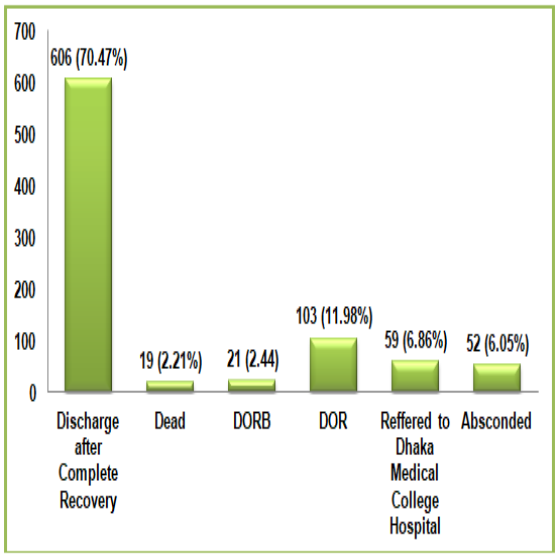

Figure 4. Outcome of poisoning cases

Discussion:

Poisoning is one of the most common causes of emergency hospital admission, whereas the patients with minor symptoms and asymptomatic cases may not seek the Health care service from the hospital and they might be missed in the statistics. In Bangladesh, all the poisoning patients are remarked as a police case during their admission in the government hospital. So, the poisoning patients from the affluent family may seek their necessary treatment from the private health care settings. Therefore, the exact incidence of acute poisoning may not be found. This study intended to look into the factors which may be modified to improve outcomes and duration of hospital stay in poisoning. In poisoning cases, we noticed a trend for better survival chances in patients who had received first aid at home and some outside treatment before reaching hospital. The receipt of outside treatment, however, significantly decreased the duration of hospitalization in poisoning cases, thereby implying the need and importance of early treatment in these cases. The duration of hospital stay also had a direct correlation with lag time in reaching the hospital. Hence, there

is a need to strengthen the importance of first aid and develop adequate strategies to improve the quality of treatment prior to referral to higher centre. Early access to treatment, increasing community health awareness and counseling can prove to be useful steps in this direction.

Poisoning was more frequently observed in younger age groups (15-30) than older age groups. This shows that young adults are more vulnerable to this health problem which might be due to emotional and social disharmony, occupational problems and risk taking behaviors at these ages. The mean age of the cases was observed to be 26.12±11.8 years. Poisoning was found to be predominant in females (60.81%) compared with males (39.19%) in our study.There was preponderance of females presenting with poison exposure in a study conducted in Singapore enrolling 635 patients which was done by Chiu et al., (2011). Majority of the patients were married and from rural population. Housewife and students were dominant among the cases. Among the type of poisonings observed in this study the major types of poisonings included organophosphorous compounds (20.70%), Sedatives (18.26%), drug overdose (11.51%), insecticides (9.77%), corrosives (8.95%), Street poison (8.37%) and unknown poison (7.33). Some miscellaneous causes of poisonings included Alluminium phosphide, Alcohol, herbicides, pesticides, Datura, Cannabis, antidepressant, acid, kerosene and tarpine oil. The study done by Acharya et al., (2014) showed similar findings where OPC poisoning accounted for 58% of cases, corrosives 25%, rat poison 6%, drugs 5% and unknown 6%.This pattern relates to the easy availability of the above compounds. Bangladesh being an agricultural based country, OPC pesticide remains the main agent for crop protection and pest control. It is therefore likely to have adverse effects on farmers who are accidently over exposed while handling these pesticides. However, because of low cost and easy availability, it has also become an agent of choice for self poisoning. The common motive of poisoning in our study is due to suicidal intention which constituted 91.40%. The same result of suicidal intention in the poisoning has been reported by a study conducted in Kathmandu, Nepal.[20] The mean hospital stay was 3.08±1.55 days. In case of majority of the cases the number of days stayed at the hospital was two or three days. In our study 70.47% patients completely recovered from poisoning, whereas only 6.86% patients have been referred for better management. Only 2.21% patients died and the death of the patient was due to late admission to hospital after suicidal attempt with. Some of the patients (2.44%) were discharged on risk bond (DORB) and some (11.98%) were discharged on request. Only a few patients (6.05%) absconded from hospital.

Conclusion

Poisoning with various substances is a global problem. It is one of the most important reasons for emergency admission in the hospital. Educational programs with more emphasis on preventive measures are necessary to create awareness among the general public. The pattern and magnitude of poisoning are thus multidimensional and demanding multi-sectoral approach for facing the problem. The comprehensive patient care can improve the poisoning case management in our country. In an agro-based country like Bangladesh, it's very difficult to reduce the poisoning cases and mortality. As OPC is the most common form of deliberating self-harm poisoning for suicidal motive, we recommend limiting its use with caution. Familial Disharmony is the main cause of suicidal attempt in our study; we suggest improving the familial bondage to check the critical emotion. People involved in medical practice

must be aware of pattern of the common poisoning agents as well as their management. Prospectively designed multi-centered studies are needed to reflect the epidemiological properties of poisonings throughout Bangladesh and would be very valuable for the determination of preventive measures.

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