



The Pattern of Poisoning and It's Management and Outcome in a Tertiary Care Hospital, Bangladesh: An Observational Study

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Abstract: *Introduction:* In 2020, during the epidemic of corona, this study was done to see the patterns of the cases of Poisoning, in a tertiary hospital in Dhaka city. Poisoning exposure in adults and teenagers are more often intentional (recreational or suicidal), may involve multiple agents, which are commonly pharmaceuticals, and may be delayed in diagnosis and treatment. *Objective:* To assess the pattern of cases of poisoning found in 2020 January to February 2021, management and outcome. *Methods:* This Observational study was performed at Square Hospital, Dhaka, exclusively over 40 poisoned patients. It included the cases of poisoning, admitted in 2020 January to 2021 February. The collected cases are of commuter poisoning, suicidal poisoning, methyl alcohol poisoning and poisoning with sedative agents by housemaids. All these cases were admitted initially in the ICU after the initial management given in the Department of emergency. *Results:* In total we managed 40 cases. Among the 22 cases of suicidal poisoning, sedative poisoning was 10, antidepressant were 4, anti-schizophrenic was 1, anticonvulsant were 2, paracetamol poisoning was 1, propranolol poisoning 1. We found 1 case of paracetamol poisoning, 1 case of mixed oral anti diabetic agents (dapagliflozin, sitagliptin, glimeperide, added with metformin) 1 case of unknown poisoning (as blood level of drugs revealed nothing may be because of late presentation). We also found 12 cases of methanol poisoning and 6 patients of unknown poisoning. Among them 3 patients was poisoned by housemaid, 3 patients were cases of street poisoning. Benzodiazepine was found in all these 6 cases. In other studies it is found that, street poisoning by sedative hypnotic drugs were the highest percentage (37%) and all were male. E. Most of the victims of street poisoning were business man (67.56%) rest were normal/domestic travelers (16.2%) and few were service holders (10.81%). E. There were financial loss (loss of money or expensive things) of the patients. In analysis of the causes behind suicidal poisoning in other studies it is also found that, 57% were due to familial disharmony, 23% were poverty related, 15% were due to failure in affairs, 11% were due to failure in the examination, 4% were due to sexual abuse and 5% due to chronic illness and unknown cause. E. *Conclusion:* In the year of 2020, January to December, it was observed that the cases of alcohol poisoning was reduced. But in 2021 January to February there was a rapid rise of cases (8 cases in 2 months, the number we found in whole year of 2020 was only 4).

Keywords: Poisoning, Suicidal Poisoning, Trend, Street Poisoning

1. Introduction

In 2020, during the epidemic of corona, this study was done to see the patterns of the cases of Poisoning, in a tertiary hospital in Dhaka city. Poisoning and drug overdose are important health problems in developing countries. The cases of poisoning a matter of serious public health concern. We found that, the cases of suicidal poisoning increased in 2020. Poisoning is associated with a high case fatality rate [1]. The year 2020 was the time of corona epidemic, when people were mostly in lockdown. Patients of psychiatric illness are very vulnerable and they need counseling according to their needs. Some of them needs frequent seating with their psychologist which is also obvious in this study. Deliberate self-harm is a major public health problem in many developing countries including Bangladesh. In rural areas pesticides is the common mode of suicidal poisoning but in urban area, pharmaceuticals are used. In developing countries the fatality rate is 15 times higher than in industrialized countries 4A [2]. Missing the schedule may result in significant deleterious effects such as deliberate self-harm. From this study, we can assume regarding methanol poisoning that, there was less availability of methanol in 2020, and that was the reason of reduced cases of methanol poisoning. But in 2021 January to February, there was rapid rise of methanol poisoning. In our hospital as well as in other hospitals, fatalities due to methanol poisoning was rising. In the year 2021 the people were living near normal life and to some people, illegal and non-standard alcoholic beverages became available. The important factors influencing outcome in patients with poisoning are severity of poisoning, type of poison, quantity consumed, time of event, time to present at hospital, duration of stay at hospital, stay in ICU, need for ventilation and complications during the stay at hospital. In acute case of poisoning, management is mostly by stomach wash, and using the agents to reduce toxin absorption (by activated charcoal), administration of specific antidote and most importantly provision of basic supportive care. Stomach wash is always avoided in corrosive poisoning [3, 4]. Gastric emptying only benefits the severely poisoned patients in whom it was started within 1 hour. In Paracetamol poisoning N acetyl cysteine (NAC) was the antidote used. Most of the barbiturate overdose were managed symptomatically. Forced alkaline diuresis as infusion was used in the patients, whose drug level was elevated. This study aims to review the incidence of poisoning and drug overdose in a tertiary care hospital and also the determinants and final outcome of patients with poisoning and drug overdose. Methanol is a toxic alcohol, which is widely used as a solvent and to denature ethanol [5]. Almost all cases of acute methanol toxicity result from ingestion [6]. Ingestion of as little as 30 ml of pure methanol has caused permanent blindness and 30 - 240 ml is potentially fatal B2. Methanol itself has a relatively low toxicity, but produces toxic metabolites as formaldehyde and formic acid [7, 8]. The acidosis appears to be caused by formic acid production and formic acid/formate is the

principal cause of ocular toxicity. B2. As methanol is cheap and easily accessible, it has been used in the production of imitated spirits and wine, so cause the mortality and morbidity in many people [7]. In our hospital we received 12 patients with severe toxicity and after initial resuscitation and investigations they were admitted in the ICU. They were managed with mechanical ventilation, Hemodialysis, intravenous sodium bi carbonate, Follinic acid and specific antidote ethanol. The role of the study was to assess the clinical manifestations and outcome in methanol intoxication. The mode of street poisoning is usually food or beverages with mixed benzodiazepine preparation. In the year 2000, the diagnosed cases of depression, anxiety, schizophrenia suffered a lot. There was less communication and counseling of patients who missed their regular visits with psychiatrist and psychologist. So, the diagnosed cases of depression, generalized anxiety disorder, personality disorder and schizophrenia had developed suicidal tendency and cases of suicidal poisoning increased due to other social circumstances.

2. Materials and Methods

The study was an observational, retrospective study, conducted for a duration of 14 months carried out at a tertiary care center, Square Hospital, with special services well equipped with modern diagnostic and treatment facilities. Though most of the private hospitals don't deal with these cases probably due to medico legal issues, Square Hospital couldn't refuse to give service considering the necessity of immediate management to these patients whose lives can be saved. RTPCR for COVID 19 was sent for all patients. They were initially admitted as suspected cases of CORONA ICU (yellow zone). When report was available and the report of RTPCR for COVID 19 was negative, the patients were transferred to CORONA negative ICU (green zone). All the patients were RTPCR negative for COVID 19. Only 1 patient had history of Corona infection 1 month back and he had post COVID fibrosis of lungs.

Data were collected from medical records of all adult patients admitted to the emergency medicine department with a primary diagnosis of poisoning and drug overdose after approval from hospital authorities. We collected the information regarding gender, age, sign and symptoms of intoxication, laboratory findings, therapeutic interventions, duration of hospitalization and outcome. Data were kept confidential in all stages of the study. In all cases, consent was taken from the patients or their attendants, while collecting the data. At that time the patients with suicidal poisoning were seen by psychiatrist and counseled by clinical psychologist when they were fully receptive to the advice. Some of the cases were diagnosed cases of depression, generalized anxiety disorder, personality disorder and schizophrenia who missed their counseling and follow up visits with their consultants during the period of pandemic.

3. Results

In our study we found 22 patients of suicidal poisoning. All attempted cases were by pharmaceutical agents. In our retrospective observational study, we collected the data of 12 patients of methanol poisoning. All patient underwent immediate hemodialysis. 10 patients (83%) recovered after HD without any neurological complications. Only 1 patient developed blindness as he refused to give consent for dialysis and it was delayed. 2 victims (17%) who presented with less than 6.8 pH, expired despite dialysis. These 2 patients who died, were referred from another hospital and we couldn't save possibly due to late presentation and failure to detect early signs in previous hospital. An awareness program can be started among health care personnel to save young lives. Out of the 12 cases, 8 cases needed single session. 4 needed 2 sessions of dialysis.

Table 1. Pattern of poisoning.

Pattern of poisoning	N (%)
Paracetamol	1 (4.5%)
Antschizophrenic	1 (4.5%)
OHA	1 (4.5%)
Corrosive	1 (4.5%)
Antidepressant	4 (18%)
Unknown	1 (4.5%)
Propranolol	1 (4.5%)
Antiepileptic	2 (9%)
Sedative	10 (45%)
Mixed (among 22 cases)	7 (31%)

Table 2. Previous psychiatric condition.

Previous psychiatric condition	Frequency
Major depressive illness (1 patient had h/o previous suicidal attempt)	2
Bipolar disorder	1
Alcoholic and substance abuse.	3
Generalized anxiety disorder	2
Personality disorder	1

Table 3. Characteristic poisoning.

Characteristic poisoning	N (%)
Men	10 (45%)
Women	12 (54%)
Unmarried	12 (54%)
Married	10 (45%)

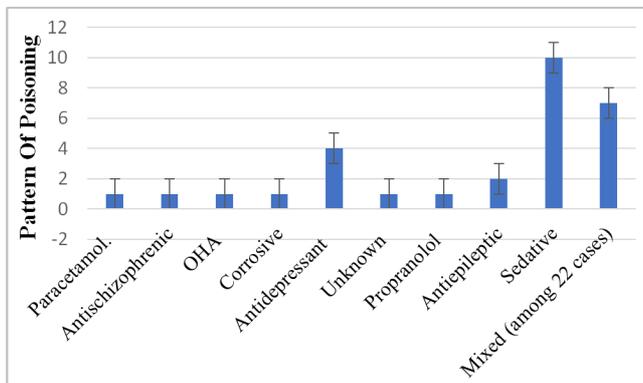


Figure 1. Pattern of poisoning.

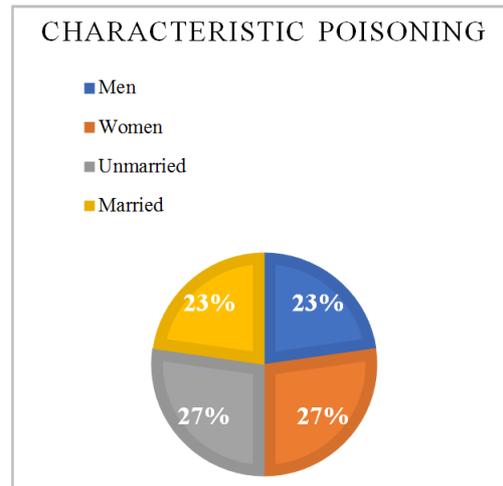


Figure 2. Characteristic poisoning.

Table 4. Causes of Dispute.

Causes of dispute	N (%)
Argument with brother	1 (4.5%)
With parents	1 (4.5%)
Familial disharmony	10 (45%)
With colleague	1 (4.5%)
Disappointment in job.	1 (4.5%)
With girlfriend	1 (4.5%)
Unknown causes	3 (13.6%)
Trouble with friends	4 (18%)

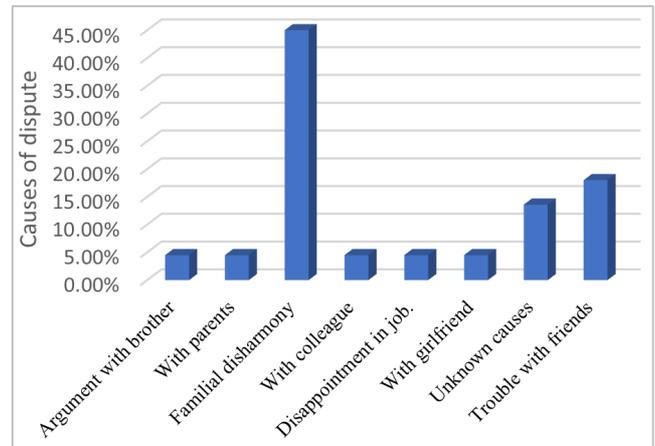


Figure 3. Causes of Dispute.

Benzodiazepine was found in all these 6 cases. In other studies it is found that, street poisoning by sedative hypnotic drugs were the highest percentage (37%) and all were male. E. Transport related poisoning was caused by benzodiazepine and in our study we also found that. Most of the victims of street poisoning were business man (67.56%) rest were normal/domestic travelers (16.2%) and few were service holders (10.81%). E. There were financial loss (loss of money or expensive things) of the patients. In analysis of the causes behind suicidal poisoning in other studies it is also found that, 57% were due to familial disharmony, 23% were poverty related, 15% were due to failure in affairs, 11% were due to failure in the examination, 4% were due to sexual abuse and 5% due to chronic illness and unknown cause. E.

Table 5. Duration of hospital stay.

Duration of hospital stay	
Less than 3 days	7 (31.8%)
1 week	9 (40.9%)
2 weeks	6 (27%)

Table 6. Following table shows their diagnosis and number of sessions.

After 1 year we discussed with our clinical psychologist about our patients, their current condition and whether they improved or still require consultation with them. The following table shows their diagnosis and number of sessions.	
Major problem	Number of sessions
Depressive disorder	2
Bipolar disorder and familial disharmony	2
Generalized anxiety disorder	1
Conversion dissociative disorder with family problems	6 and continuing
Personality disorder	4
Major depressive disorder	4
Narcissistic personality disorder	3 and F/up after 3 months
Personality disorder with depression	7 and continuing
Depression	1
Depressive disorder	2
Depressive disorder with familial disharmony	2
Depression	4 and continuing

Table 7. Methanol poisoning.

Methanol poisoning	Year
4	2020 (Jan-Dec)
8	2021 (Jan-Feb)

Table 8. Survivor and Non-survivor patients' age.

Age	Survivor	Non-survivor
(15-52 Years)	10	2

4. Discussion

In a study on patterns of suicidal poisoning and drug overdose in India it was found that – organophosphorus (OP) (32.5), pyrethroid (17.2) and organocarbamates (12.2) were the commonly used poisons [3]. Sedative and anti-epileptics (21 each) were the common drugs for drug overdose A. In that study of India, sedative and anti-epileptic drugs were the most common, with 21% each, followed by antidepressant and paracetamol, in the pattern of drug overdose A. [4]. Sedative hypnotic drug was the most widely used drug (45%), found in our study. The second most common drug was the antidepressant (18%). Mixed drug poisoning being 31%. In our study we observed, age distribution of suicidal poisoning was mostly of 20-30 years of age. We found patients admitted of 20 yrs to be the lowest age and 63 years to be the highest age. In the study of India drug overdose was found to be 42.7% (91/213) of the study population, of which female patients accounted for 75% of the cases [3]. Young women in the age group of 21-30 years accounted for 39.5% of the drug overdose cases with nearly 50% being married, and were from an urban background [5]. Outcome parameters of hospital and ventilator requirement were significant. There was a significantly greater need for assisted ventilation in patients with poisoning as compared with drug overdose. The overall case fatality rate was 2.4%. A. The

number of male patients with poisoning were significantly greater than the number of women with poisoning. A. But we found the reverse. Among patients with poisoning, 67% required intensive care, and the duration of stay in the intensive care unit was 4.43 ± 2.80 days. Of those patients in the ICU, 21.9% needed assisted ventilation for a period of 6.05 ± 3.42 days. A. In a study of street poisoning, it was observed that, 98% of patients remembered buying or accepting food or drinks before losing consciousness. Direct financial damage (missing property) was diverse and frequently existential. D. Among 94 urine sample analyzed by FPIA, 74% tested positive for benzodiazepine. Among 15 urine samples analyzed by LC-TOF MS, lorazepam was detected in all; five also contained diazepam or metabolites; nitrazepam was present in three. D. The study show the medico social emergency of travel-related poisoning in Bangladesh, which is a drug-facilitated organized crime and benzodiazepine drugs are used to commit these crimes, suggesting modifications to the local emergency management of the victims of this type of poisoning. They also highlight the need for more research in the neglected field of acute poisoning in Bangladesh, and for criminal investigations of the use of benzodiazepine drugs in this country. D. [9]. In the patients of methanol poisoning, most of the patients (60%) had leukocytosis, and in others the numbers of white blood cells (WBC) were within normal range [7, 9]. The median number of WBC was 13400/microliter with the range of 6000-26409/microliter. B. 40% of the patients showed hyperkalemia and in others the level of potassium was in the normal range. B. Hyperglycemia was also observed in 70% of the patients. B. Most of the patients were treated with oral ethanol solution 10% as an antidote [10]. In 46% of patient hemodialysis was performed. 30% of the patients died while 2 of the remaining survivors became blind. B.

5. Conclusion

Poisoning is a medical emergency and so, initial treatment should be started within first hour. We received all the cases of suicidal poisoning at late evening, night and late night. All of them residing in the city of Dhaka. It is observed that, diagnosed cases of psychiatric illness are most vulnerable for taking the suicidal attempts. Their appointment with their doctor should not be missed. And all the cases should not leave hospital without consulting a psychiatrist and clinical psychologist for the prevention of further attempts. According to the result of the study, it could be concluded that coma, respiratory depression, PaCO₂ and hyperglycemia are strong predictors of poor outcome of methanol poisoning. B. Early diagnosis, high clinical suspicion and early intervention can save lives and prevent blindness. Caution should be taken while traveling in bus even in intercity transport. No request for taking food or drinks should be accepted. People should be aware in keeping house maids. Prolonged sleep or drowsiness should be suspected as some kind of poisoning and should be taken to hospital as early as possible. Our study population is small. It should be studied further for few more years.

Conflict of Interest

The authors have no conflict of interest on this manuscript.

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