

A Clinico-Epidemiological Study of Poisoning among Commuters: Is There any Substance Abuse?

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Abstract

Background: Poisoning among commuters is becoming a major health hazard day by day in Bangladesh. Few studies were done in Bangladesh regarding this problem. The study aims at describing the clinico-epidemiological features of patients with suspected intentional poisoning during travel for robbery.

Method: This was a prospective observational study, conducted in medicine department of Chittagong Medical College Hospital, Bangladesh during March 2010 to September 2010. 40 patients were selected. Out of whom, 15 who had GCS < 8 at presentation were selected for urine analysis by detection kits for a few substances in the urine. Detailed demographic data were collected from the informant in a structured case report form. Clinical examination of the patient was done at presentation and urine was collected in selected patients. Routine patient follow-ups were carried out and the outcome was recorded.

Results: Victims were males of 31.23 ± 7.6 years age, most of whom were married (80%), and businessmen (40%). Most of them were brought to hospital by their relatives (80%). Their financial loss by the incidence did not exceed 50,000 tk (i.e., 18937 Tk). They were mainly from middle class family, usually poisoned by beverage (55%), food (30%), and inhalation (5%). Most of them presented with unconsciousness (75%), having GCS 10 on average. Their pupils usually remained constricted bilaterally (75%) with intact light reflex in 35% of the cases. There was no papilledema, and cranial nerves were usually intact in those who could be examined (25%). Patients were usually depressed with absent planter reflex (70%) or flexor (30%). Within 2.5 days, most of them could walk without support and could be discharged. There was neither any case fatality reported or any long term disability recorded. Only 7.5% of the patients had substance examined by kit in their urine.

Conclusion: We can come to the conclusion that people who carried money on themselves were victimized by the miscreant and they usually used a substance which had a short onset of action and which could sedate people for a short time with depressive neurological findings.

Keywords: Commuter Poisoning; Epidemiology; Substance of Abuse

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INTRODUCTION

New insights in medicine and acceptable treatments necessitate an adjustment to the existing definition of clinical or forensic poisoning to: An individual's medical or social unacceptable condition as a consequence of being under influence of an exogenous substance in a dose too high for the person concerned (1).

Acute poisoning is an emerging health problem in both developed and developing countries. In developed countries, drug poisoning is more common but in agriculture-based developing countries pesticide poisoning is commonest. In

the United Kingdom, it accounts for 13-20% of all medical emergency admissions to hospital (2). Suicidal attempt in young population is the usual candidate for poisoning (3-5). Poisoning in the developing countries was with organophosphorus and other household substances in recent past (7).

Today, poisoning is increasing among the commuters and victims are getting admitted in hospital. Datura was initially used to stupefy for robbery; it was also used in India. But the pattern of poisoning is changed recently; culprits use benzodiazepine now (8).

In Bangladesh, acute poisoning related hospital admissions

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are not at a low rate either. Poisoning recorded with injury had the highest rate for admission in Upazila health complex (2,09,319, 19.49%), 2nd highest rate in district level hospital (93915, 12.8%), and the highest in medical college hospital (96201, 18.75%) in 2015 (9). Poisoning data are not available separately.

In our country, poisoning causes around 300,000 episodes and around 2,000 deaths per year. On average, 1-2 patients poisoned during journey got admitted in Bangladesh. A study conducted in Dhaka Medical College Hospital from Jan 2004 to July 2004 found that 172 patients were admitted due to poisoning which was 9.26% of total patients and 49.3% of poisoning patients (10). We do not get data about poisoning among the commuters from Chittagong Medical College Hospital as along with other poisonings it was labeled as an unknown poisoning. The total number of street poisonings at Unit I in 2008 was 240 (2.4% of total patients), and unknown poisoning in Unit 2 and 3 was 752 (3.7% of total patients). The incidence of this type of induced poisoning in cities like Dhaka, Chittagong, Rajshahi, and Khulna is increasing during religious festival time like Eidulfitr, Eidulazha, and Durga Puja. Some people sell herbal medicine and chocolate at crowds, bus stands and even religious gatherings like *ijtema*. They are part of the organized criminal core. Though mortality is not high due to such poisoning, relatives of the patients panic due to deep unconsciousness of the patient. Previous studies show that short acting benzodiazepine is widely practiced nowadays for making the patient sleepy during travel. They usually use lorazepam and nitrazepam, the metabolites of diazepam (11).

Being a border and port city, Chittagong serves as a transit route for drug smuggling. Heroin, ganja (Marijuana), yaba, and fensidylare are most abundant in Chittagong (12). Easy availability of drugs is the prime cause of the growing number of drug abusers in Bangladesh. Growing criminal activities, such as robbery, burglary, theft, mugging, extortion, forgery, family violence, sexual assault, and gang assault in Bangladesh are believed to be partly attributable to drug abuse (13). Some recent studies showed that drug facilitated crime is increasing and substances of abuse are being used. Also, they indicated that these types of drug are easily available to that group of people (11, 14, 15). In this study, a rapid immunochromatographic test kit was used to detect the presence of some substances of abuse in urine. This is a qualitative assay of substances such as d-amphetamine, secobarbital, oxazepam, d-methamphetamine, methadone, buprenorphine, morphine, monoacetyl-morphine, phencyclidine, imipramine, and THC 57.

METHODS

This was a prospective observational study conducted in Medicine Units of Chittagong Medical College Hospital, Bangladesh during March 2010 to September 2010. Patients admitted with a history of poisoning during travel within the last 24 hours were enrolled in the study. Patients were selected after informed written consent was received from their legal guardian when the patient was unconscious and from the patient when s/he became conscious. Patients unwilling to be part of the study were excluded. Detailed demographic and clinical data from the patient and their

attendant were recorded in a case record form. Patients with GCS < 8 were selected for urine examination by the kit (MAHSAN Diagnostika BENZO) for a few substances like d-amphetamine secobarbital, oxazepam, benzoylecgonine, methamphetamine, methadone, buprenorphine, EDDP, morphine, monoacetyl-morphine, phencyclidine, imipramine, and THC 57. Case record form and SPSS 12 were used for documentation and statistical analysis, respectively.

RESULTS

Among 40 patients, all were male (n = 40, 100%), with variable age mean of 31.23±7.6 years. Professional businessmen were predominating (n = 16, 40%). Most of the patients (60%, n = 24) came from middle income family. Public bus (n = 22, 55%) and baby taxi (n = 4, 10%) were the common vehicles used in these incidents. CNG fueled baby taxi was used in case of inhalation mediated poisoning (Table 1).

Among the patients, 80% (n = 32) were married. Relatives (n = 32, 80%) brought the victim to hospital in most cases. Monetary loss was usually by wallet and cell phone and the mean loss was 8,937 (SD±973) Tk. In most cases (n = 22, 55%), the miscreant offered a drink/beverage during the journey or at bus stand in the form of cold water, green coconut, and juice. Foods such as *jalmuri* and *chanachur* (type of snacks) were offered in 30% of the cases. In 5% (n = 2) of the cases, inhalation was used. This patient recalls that they smelt some odor before getting unconscious. 10% (n = 4) of the patients could not remember what had happened.

Table 1. Age, profession, initial rescuer and mode of transport during poisoning of the respondents

Variable	Number of patients (n)	Percentage (%)
Age (years)		
<16	0	0
16-30	16	40
31-45	18	45
46-60	4	10
>60	2	5
Profession		
Businessman	16	40
Student	6	15
Service holder	6	15
Farmer	4	5
Other	8	10
Socioeconomic condition		
High income family	4	10
Middle income family	24	60
Low income family	12	30
Mode of transport during poisoning		
Bus	22	55
Baby taxi	4	10
Train	2	5
Other transports	4	10
Not in transport	8	20

100% (n = 40) of the patients had no history of alcohol intake before the journey.

90% (n = 36) of the patients had a normal pulse (mean 80±11 bpm). 10% (n = 4) of the patients developed bradycardia, 70% (n = 28) had a normal blood pressure with systolic mean 112.25±14.97 mm of Hg, diastolic mean 72.63±9.7 mm of Hg, 30% (n = 12) had hypotension, 90% (n = 36) had normal respiratory rate with mean respiratory rate being 17(±1) bpm, and 10% (n = 4) had bradypnoea (respiratory rate < 8 /min). Breathing pattern was normal in 100% (n = 4) of the cases. Average GCS was 10 (SD±3).

There was no papilledema. Planter reflex was absent in 70% (n = 28) of the cases bilaterally. Sensory function was intact in 25% (n = 10) of the cases. The rest could not be examined due to unconsciousness. Gait was also normal in 25% (n = 10) of all the patients. The remaining ones could not be examined. Cranial nerves in those who could be examined were normal. Muscle power was reduced in 90% (n = 36) of the cases in all 4 limbs, and normal in 10% (n = 4) of the cases (Table 2). There was no abnormal voluntary movement, abnormal behavior and sign of meningeal irritation.

No patient was given gastric lavage at emergency or in ward. 65% (n = 26) of the patients were given antibiotic, and all of them were catheterized. 15% (n = 6) of the patients were absconded before formal discharge remaining was discharged; no patient died. The average hospital stay was 2.5 days.

7.5% (n = 3) of the patients' urine had kits positive where either of the substances was present in the patient's urine.

DISCUSSION

40 patients were enrolled in the study fulfilling the inclusion criteria. All (100%) of them were male, similar to the _____

Table 2. Neurological features of the patients

Variable	Number (n)	Percentage (%)
Consciousness		
Unconscious	30	75
Drowsy	10	25
Condition of the pupil in both eyes		
Constricted	10	25
Mid dilated	30	75
Dilated	0	0
Light reaction		
Intact	26	65
Impaired	14	35
Muscle power		
Normal	4	10
Reduced	36	90
Deep tendon jerks		
Normal	10	25
Decreased	30	75

findings of Amin MR et al. (100%), and Mojumdar MMA et al. (98%) (8, 10). Males were predominant possibly because of the outdoor nature of their occupation. Males are financially an important group and they usually carry money. Traditionally, females rarely go out to public places while carrying money. So, males are easy targets of miscreants for robbery. Moreover, religious background of Chittagong is highly conservative and Muslim females are not used to chat with unknown people during journey. Mean age at presentation was 31.23 (SD ±7.6) years; mostly within 16-45 years (85%) especially within 31-45 years (45%), slightly higher than Mojumder MMA et al. (28.8 ±2.5) and Howlader et al. (40% of the patients were 36-49 years) (10, 16). Persons of young age group were targeted as they are economically productive. Most of them were married (80%).

Amin MR et al. showed that the police were the initial rescuer in most of the cases (83.87%), but in this study we got a totally different picture (8). Patients' relatives were informed before the patients arrived to hospital in most of the cases (80%). In most cases, someone (co-passenger, transport vehicle staff or passerby got identification note, e.g., phone book, card, etc. and contacted the family, relatives or a friend. They usually accompany while the patient is admitted in hospital. These sorts of awareness among the common people to keep an identity with him had changed the picture of the total scenario. Patients were more cared and a more authentic history was taken with greater confidence. The loss was on an average 18,937 (SD±9,739) Tk ranging from no loss to 40,000 takas. In most cases, the victim lost his wallet and cell phone. Only one patient in the study had a large amount of cash who was going to buy oxen from market. It was diverse in Mojumder MMA et al., varying from 0 to \$500 (10). Most of the patients were businessmen (40%); the rest were farmers (10%), and students (15%). Howlader et al. found 67.5% businessmen in his study while Mojumder MMA found 34.5% farmers/day laborer with 13.7% businessmen (10, 16). Chittagong is the port city of the country and business is the main profession in this region.

This finding differs from that of Mozumzdar et al. (10). Bus (55%) was the commonest vehicle like other studies (76% in Mojumder MMA et al.) (10). Bus service is still popular for common people. Those who are usually young use bus for longer routes of journey. In most cases (55%), the miscreant offers a drink/beverage during journey or at bus stand in the form of cold water, green coconut, and juice. Foods such as *jalmuri* and *chanachur* were offered in 30% of the cases. In 5% of the cases, inhalation was used. This patient recalls that they smelt some sweet odor before getting unconscious. 10% of the patients cannot remember what has happened. The result was similar to that of Mojumder MMA et al. (71% drinks, 10% traditional drug during canvass), Amin et al., and Jain A et al., 2000 (8, 10, 17). The offer was made after starting a chat. The thirsty victim was easily victimized with the offer of taking drinks or "dub water (green coconut water)", juice, cold water, etc. Miscreants usually appeared in front of the victim from mobile venders like rickshaw van, howker and drink simultaneously with victims. There is usually an organized group to make this crime in public places. _____

Recently, one of the group leaders, who had the experience of cheating at least 400 people in this way, was arrested in *ijtema* (religious gathering of Muslims in Dhaka). 60% of the patients came from middle class family, 30% came from lower class family, and 10% from higher class family. Middle class family members usually use public transports like bus, train or baby taxi in regular traveling.

Most of the patients were hemodynamically stable at presentation. 90% of the patients had a normal pulse (mean 80 ± 11 bpm). 10% of the patients developed bradycardia, 70% had normal blood pressure with systolic mean 112.25 ($SD \pm 14.97$) mm of Hg, diastolic mean 72.63 ($SD \pm 9.7$ mm) of Hg, 30% had hypotension but no other feature of peripheral hypo perfusion or shock that urges immediate resuscitation. 90% had normal respiratory rate with mean respiratory rate 17 ($SD \pm 1$) bpm, 10% had bradypnoea (respiratory rate < 8 /min). Breathing pattern was normal in 100% of the cases. In the study of Mojumder MMA et al., 17% of the patients had bradycardia and 26% had hypotension (10).

Most of the patients were presented with unconsciousness (75%). Average GCS was 10 ($SD \pm 3.1$). The duration of unconsciousness was short term and without any sequel. Mojumder MMA et al. found patients with low GCS (GCS 11-14 74% and GCS 4-10 were 15%) (10). No specific management was required for gaining consciousness. This gives us the impression that miscreants use short acting substances which make the person temporarily sleepy or unconscious. Pupil was initially constricted in 75% of the cases with intact light reflex in 65% of the cases. There was no papilledema or cranial nerve involvement. Jerks were usually depressed.

All the neurological findings were consistent with depression of nervous system; all were transient and recovered. The findings were consistent with those of Mojumdar MMA et al. and Amin et al. (8, 10).

Urine examination with rapid immunochromatographic test kits was to detect some substances of abuse in urine. 7.5% of the patients were kits positive. Any one of the substances might be present in patients' urine. There was no chance to detect lorazepam which was the principal substance found by Mozumader et al. in the kits (10). Within 2 days, most of them could walk without support and were discharged; 15% were absconded though.

LIMITATIONS

There was a variable difference between patients in duration, incidence and hospitalization. Clinical features may differ from patient to patient for this. The diagnostic kit was not specific. Either of the substances can be present in urine in patients who were "Kits Positive." Study time and sample size were small. We cannot get the whole picture from this study. Larger study with large number of samples and multicenter involvement is required to conclude the situation.

CONCLUSION

The study aimed to detect an epidemiological picture of the victims who lost their social security during travel and admitted helplessly to Chittagong Medical College Hospital

and if possible to get an idea whether any substance of abuse is related to the poisoning. Huge number of patients were admitted in the hospital but only this group of people reflect the lack of our social security. They are not sick; their economic loss may not be too high; no significant mortality or physical morbidity is there except loss of working days, but it is painful to confess that our state should give the assurance that one should not be hospitalized for such bad things. We hope and pray that we will not be among victims.

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REFERENCES

1. Uges DR. What is the definition of a poisoning? *J Clin Forensic Med* 2001;8:30-3.
2. Sarkar ZM, Khan RK. Acute poisoning— scenario at a district hospital. *Bangladesh J Med* 2002;13:51.
3. Batman N. The epidemiology of poisoning. *Med* 2007;359:537-9.
4. Malangu N. Acute poisoning at two hospitals in Kampala— Uganda. *J Forensic Leg Med* 2008;15:489-92.
5. Senanayake N, Karalliedde L. Pattern of acute poisoning in a medical unit in central Sri Lanka. *Forensic Sci Int* 1988;36:101-4.
6. Thomas M, Anandan S, Kuruvilla PJ, Singh PR, David S. Profile of hospital admissions following acute poisoning— experiences from a major teaching hospital in south India. *Adverse Drug React Toxicol Rev* 2000;19:313-7.
7. Srivastava A, Peshin SS, Kaleekal T, Gupta SK. An epidemiological study of poisoning cases reported to the National Poisons Information Centre, All India Institute of Medical, Sciences, New Delhi. *Hum Exp Toxicol* 2005;24: 279.
8. Amin MR, Awal A, Sattar MA, Hasan R, Islam R, Jalil MA et al. Pilot survey on cases of poisoning and its outcome in different category of hospitals in Bangladesh. *J Med* 2009;10:15-7.
9. Ministry of Health and Family Welfare. Bangladesh Health Bulletin. Dhaka, Bangladesh: Ministry of Health and Family Welfare ;2016.
10. Majumder MMA, Basher A, Faiz MA, Kuch U, Pogoda W, Kauert GF et al. Criminal poisoning of commuters in Bangladesh: Prospective and retrospective study. *Forensic Sci Int* 2008;180:10–6.
11. Beynon CM, McVeigh C, McVeigh J, Leavey C, Bellis MA. The involvement of drugs and alcohol in drug-facilitated sexual assault: a systematic review of the evidence. *Trauma Violence Abuse* 2008;9:178-88.
12. Drugs flow freely from Burma to Bangladesh. *Burma News International*. 2009 July.
13. Rahman M, Uz-Zaman MS, Sakamoto J, Fukui T. How much do drug abusers pay for drugs in Bangladesh? *J Health Popul Nutr* 2004;22:98-9.
14. McGregor MJ, Ericksen J, Ronald LA, Janssen PA, Van Vliet A, Schulzer M. Rising incidence of hospital-reported drug-facilitated sexual assault in a large urban community in Canada, Retrospective population-based study. *Can J Public Health* 2004;95:441-5.
15. Hall JA, Moore CB. Drug facilitated sexual assault—a review. *J Forensic Leg Med* 2008;15:291-7.
16. Howlader MR, Sarder MH, Amin MR, Morshed MG, Islam MS, Uddin MZ et al. Clinico-epidemiological pattern of poisoning in a tertiary level hospital. *J Dhaka Med Coll* 2008;17:111-5.
17. Jain A, Bhatnagar MK. Changing trends of poisoning at railway stations. *J Assoc Physicians India* 2000;48:1036.