Original article

Drug abuse proprtion and pattern in Bangladesh: a laboratory based study

Lubna Naznin,[1] Susane Giti,[2] Arif Ahmed Khan,[3] Md Rafiqul Islam,[4] Md Arifuzzaman,[5] Md Jahangir Chowdhury[6]

[1]Classified Specialist in Pathology, Armed Forces Institute of Pathology (AFIP), Dhaka Cantonment, Dhaka, Bangladesh; [2]Commandant, Classified Specialist in Pathology, AFIP, Dhaka Cantonment, Dhaka, Bangladesh; [3]Classified Specialist in Pathology, AFIP, Dhaka Cantonment, Dhaka, Bangladesh; [4]Graded Specialist in Pathology, AFIP, Dhaka Cantonment, Dhaka, Bangladesh; [5]MD Resident of Psychiatry, National Institute of Mental Health, Dhaka, Bangladesh; [6]Professor, Department of Paediatrics, Marks Medical College and Hospital, Dhaka, Bangladesh.

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Correspondence
Lubna Naznin
Mobile: +8801552425281
E-mail: lubna101000@gmail.com

Summary

Drug addiction is now a great concern for Bangladesh because of its geographical location. It appears as a growing challenge for this developing country. The aim of the study was to find out the proprtion and pattern of drug abuse among the adults. This lab based cross sectional study was carried out on 4115 individuals at Armed Forces Institute of Pathology (AFIP) from July 2019 to June 2020 on both males and females, reporting for screening of drug abuse for employment, admission in educational institutes and suspects in working places. After justification of urine specimen by urinary creatinine level, qualitative screening test for 12 drugs of abuse was carried out by 'Abon' multi-drug one step multi-line screen test device. Screen positive samples were then confirmed with homogeneous enzyme immunoassay in Architect c 8000 analyzer of Abbott. The results showed that, 221 (5.37%) were positive for abuse of one or multiple drugs. Mostly the younger age group mean±SD, 24.69±6.52 years (IQR: 20-28 years) were the drug abusers. The most abused drugs was benzodiazepines (36.6%) next in order were marijuana or tetra-hydro cannabinoids (35.8%), amphetamine and methamphetamine (19.8%), opiates (4.7%) and methylene di-oxy methamphetamine (MDMA) or ecstasy (3.1%). The most of the abusers' used a single drug (85%). Marijuana or tetra-hydro cannabinoids was the commonest drug in use in case of multiple drug usage of different combinations. This study showed the pattern of abused drugs and highlighted that, the younger age groups were the most liable group. So, they need more attention from their parents, society and educational institutes to overcome the worrying situation.

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Introduction

As stated by the world health organization (WHO), substance abuse is persistent or sporadic drug use inconsistent with or unrelated to acceptable medical practice.[1] In drug abuse there is illicit consumption of a substance or drug in a quantity or in a method neither advised nor approved by medical professionals. Drug addiction is now a recognized global problem.[2] Laboratory receives a request for urine drug testing for the judgment of poisoning cases. Additionally, now urine drug testing is required as pre-requisite for employment in government, armed forces and also in non-government services in Bangladesh, in educational institutes e.g., for getting admission in different national or international institutes, legal purposes, athletics, in military service etc.[3] This test is also performed in drivers following road traffic accidents and pilots after air craft accidents. Besides, another recent trend is random testing for suspected ones in the working place. So, drug addiction is now a great concern in Bangladesh.

In Bangladesh, about 2.5 million people are estimated to be drug addicted. Among them 80% belong to 15 to 30 years age group.[4] Peer groups influence, frustration, depression, unemployment, curiosity, unrestricted media influence, lack of parents' proper monitoring and mentoring of children, family conflicts, psychological crises e.g., refusal of love, loneliness, social crises e.g., adaptation failure to surroundings & belonging society and easy availability or access of drugs of abuse etc. are the important reported causes of drug addiction.[4]

The major illicit drugs available in Bangladesh are opium (heroin, pethedine, cocaine), cannabis/marijuana (ganja, chorosh, bhang, hashish), stimulant (yaba, ecstasy, viagra), sleeping pills (diazepam, clonazepam etc.) and cough syrup (phensidyl, dexpotent etc.) and few others.[5-7] Urine, blood, hair, saliva,

sweat, nails and meconium are the biological specimens mostly used for drug testing.[8] Different specimens provide different levels of sensitivity, specificity, and accuracy. Urine is the most preferred specimen, because of ease of collection and longer detection window than that of serum. Early morning urine is the favored one, as most concentrated having a higher concentration of the drug of abuse or its metabolites.[8]

Drug abuse hinders the forward progression of any society. It has a direct and indirect detrimental impact on society with the rise of different patterns of criminal offenses. Only few laboratory based data are available in this regard. Hence, this study was carried out to evaluate the proportion and the pattern of drug of abuse in Bangladesh based on laboratory data. It might help in the further planning, research and effective move against drug addiction.

Materials and methods

This descriptive cross sectional study was carried out at Armed Forces Institute of Pathology (AFIP) from July 2019 to June 2020. The study population included individuals, who reported to AFIP for screening of drugs of abuse for employment in government and non-government services, for getting admission in different national or international educational institutes and suspected cases in working places. Supervised urine specimens were collected in clean and dry containers in the department of biochemistry of AFIP after appropriate identification of individuals through a set procedure. Validity of urine specimen was checked before performing dope test by measuring urine creatinine by the modified Jaffe kinetic method. Urine creatinine, 25-400 mg/dL, indicated the specimens were suitable for the dope test. Initial qualitative screening for 12 drugs of abuse was done by 'Abon' multi-drug one step multi-line screen test device based on lateral flow chromatographic competitive immunoassay. Each device test results were justified against the appearance of control lines in each device. A colored line in the control region but no line in the specific drug test region indicated a positive result for that specific drug. This rapid one step screening test was used for the simultaneous qualitative detection of multiple drugs and drug metabolites namely amphetamine, methamphetamine, barbiturates, benzodiazepines, cocaine, morphine and Opiates, phencyclidines, methylene di-oxy methamphetamine (MDMA), methadone, tricyclic antidepressants (TCAs), phencyclidine and tetra hydrocannabinoids (THC). Positive cases of TCAs were ignored in our study as it was found to be a frequently prescribed drug by physicians for different purposes. Each of the screen positive drugs or drug metabolites was then reconfirmed by homogeneous enzyme immunoassay in Architect c 8000 analyzers of Abbott. The detection was based on the competition between an enzyme-labeled drug and the drug from the urine for a fixed number of specific antibody binding sites. Test result beyond the specific cut-off value was reported positive. Total 4115 individuals, irrespective of age, sex and religion were screened for drugs of abuse to assess the prevalence and pattern of substance use. Data were analyzed by statistical package for social sciences (SPSS) version 20.

Results

The results showed that, among 4115 cases, 3985 were male and 130 were female. Among the all, 221 (5.37%) were confirmed as positive for drugs of abuse by enzyme immunoassay (Figure

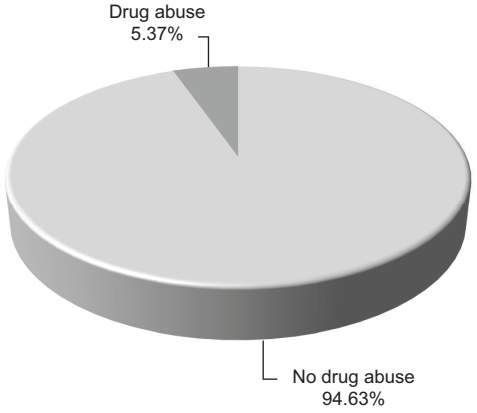

Figure 1: Proprtion of drug abuse (n=4115)

Mean age of positive drug abuse cases was 24.69±6.52 years. The minimum age was 14 years and maximum age was 54 years (Table 1).

Table 1: Age distribution of positive drug abuse cases (n=221)

Age distribution	
Mean±SD (in years)	24.69±6.52
Median and interquartile range (in years)	23 (20-28.0)
Range (min-max) (in years)	40 (14-54)

The most frequent positive drug abuse cases were 108 (48.9%) in 21 to 30 years age group and the second common 83 (37.6%) were in 11-20 years age group. It was least frequent in 01 (0.5%) beyond 50 years age (Table 2).

Table 2: Distribution of age groups of positive drug abuse cases (n=221)

Age group (in years)	Frequency	Percentage
11- 20	83	37.6
21- 30	108	48.9
31- 40	23	10.4
41- 50	6	2.6
51- 60	1	0.5
Total	221	100

Among these positive drug abuse cases, 214 (97%) were male and 7 (3%) were female (Figure 2). In this study 214/3985 i.e., 5.37% of participant males and 7/130 i.e., 5.38% of participant

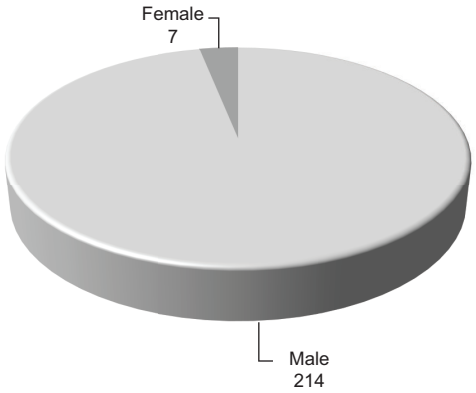

Figure 2: Gender distribution of positive drug abuse cases (n=221)

females were positive for drug abuse.

We found, most of the drug abusers 189 (85%) used a single drug, 28 (13%) used two drugs combination and 4 (2%) used more than two drugs (Figure 3). Among the single drug abusers, 80 (36.2%) used benzodiazepines, 68 (30.77%) used marijuana or tetra-hydro cannabinoids, 32 (14.48%) used amphetamine and methamphetamine, 8 (3.62%) used MDMA and 1 (0.45%) used opiates. Marijuana was the most chosen drug for all combinations in the case of drug abusers whereas amphetamine and methamphetamine was the second drug of choice for combination use in multiple drug usage (Table 3).

Total drug usage in single or in combination, benzodiazepine usage was the highest in frequency 94 (36.6%) where the second was marijuana or tetra-hydro cannabinoids 92 (35.8%) and third was amphetamine and methamphetamine 51 (19.8%). In all cases single drug was predominant than multiple drug usage. But, opiates was found more frequently to be used in

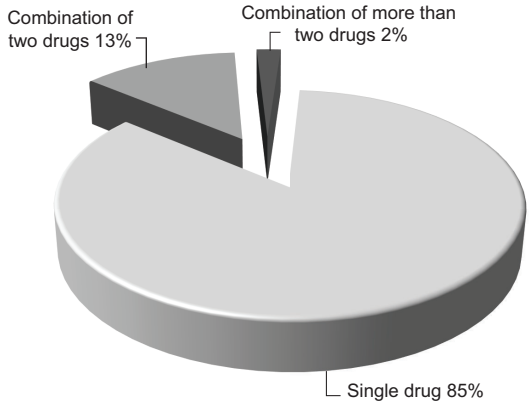

Figure 3: Distribution of single and combination drug abuse (n= 221)

Table 3: Pattern of drug use (n=221)

Pattern of used drug	Frequency	Percentage
Benzodiazepines	80	36.20
Marijuana or tetra-hydro cannabinoids	68	30.77
Amphetamine and methamphetamine	32	14.48
Methylene di-oxy methamphetamine (MDMA)	08	3.62
Amphetamine and methamphetamine + marijuana	08	3.62
Marijuana + opiates	07	3.17
Marijuana + benzodiazepines	05	2.26
Amphetamine and methamphetamine + benzodiazepines	05	2.26
Amphetamine and methamphetamine + marijuana + benzodiazepines	03	1.36
Amphetamine and methamphetamine + opiates	02	0.90
Opiates	01	0.45
Amphetamine and methamphetamine + marijuana + opiates	01	0.45
Opiates + benzodiazepines	01	0.45
Total	221	100

Table 4: Pattern of drug use in total as single or combination usage (n=221)

The drug abused	Total Frequency (%)	Single usage Frequency (%)	Combination usage Frequency (%)
Benzodiazepines	94 (36.6%)	80 (31.1%)	14 (5.5%)
Marijuana or tetra-hydro cannabinoids	92 (35.8%)	68 (26.5%)	24 (9.3%)
Amphetamine and methamphetamine	51 (19.8%)	32 (12.4%)	19 (7.4%)
Opiates	12 (4.7%)	01 (0.4%)	11 (4.3%)
MDMA (or ecstasy)	08 (3.1%)	08 (3.1%)	0 (0%)

(As one respondant used more than one drug, so the frequency didn't correspond the total number)

combination to another drug. Interestingly, MDMA or ecstasy was used singly by the abusers of the study (Table 4).

Discussion

In this study, the overall proprtion of drug abuse was found to be 5.37%. It was close to the study carried out in the outpatient department of National Institute of Mental Health, which found 7.66% suffered from the substance-related disorder.[9] Whereas, a study conducted in a psychiatric clinic in Dhaka found about 29.6% of admitted patients were suffering from substance related disorder,[10] much higher than ours. It might be due to their study was conducted on high risk for drug abusal group rather than general population.

Most of the drug abusers belonged to the younger age group. Age group 11-30 years enclosed 86.5% drug abusers in our study was an alarming sign for society. Mean±SD age of drug abusers was 24.69±6.52 years (IQR: 20-28 years). Our study finding was also supported by drug addicts under treatment programs in Bangladesh (DNC, 2013), reported 88.38% belonged to 16 to 40 years age group. A study by Ahad et al. in a drug treatment and rehabilitation center of Sylhet on 42 respondents found 55% of the drug addicts were in the age group of 22 to 29 years[6] where Maruf et al. study in a de-addiction clinic revealed mean age of drug addicts was 28.8±8 years and 77.2% belonged to 21–40 year age group.[11] In our study, males were found to be more (97%) addicted than females. But, considering the percentage of positive drug abuse cases in respect of gender, participant males were 5.37% and participant females were 5.38% respectively were similar. Maruf et al. study found most of the addicted respondents were male (90.5%)[11] and ICDDR,B study highlighted that, in the capital, around 80% of the abusers were male and 20% were female.[12]

In our study, we found drug abusers mostly used single drugs (85%) rather than multiple combinations. Our finding contradicted with Maruf et al.[11] study showing the majority (91.4%) of drug addicted individuals were polysubstance users and most (27.6%) of them used three types of substances. It might be due to that, their study was carried out in a de-addiction clinic and included a small number of study subjects, whereas, our study subjects were from the general population and included more numbers of study subjects. Besides, their study also considered nicotine and alcohol as addictive substances were not considered in our study.

In our study, the most abused drugs in order were benzodiazepines(36.6%), marijuana or tetra-hydro cannabinoids (35.8%), amphetamine and methamphetamine (19.8%), opiates (4.7%) and MDMA or ecstasy (3.1%) in the study population. Cannabinoids was the commonest in use by multiple drug abusers. Amphetamine, methamphetamine and benzodiazepines were also used frequently in multiple drug combinations by significant number of abusers. Ahmed et al. in their interview based study carried out all over the Bangladesh from different strata found, the addicts mostly used multiple drugs and the drugs were phensedyl (37%), heroine (15%), yaba (29%) and ganja (19.%).[13] Another study by Zaman et al. among 300 drug abusers attending at the outpatient department of the Central Drug Addiction Treatment Centre, Tejgaon, Dhaka, Bangladesh found that, the mostly abused one was ganja or Tetra-hydro cannabinoids (77%), followed by heroin (69.3%), yaba (62%), phensidyl (52%), injectable drug like buprenorphine, pethedine, morphine (33%), sedatives (10%), danti (10%), shisha/hukka (8%) and cough syrup (17%).[5] Variation in our study findings from them might be due to our study population included mostly job seekers, students for admission or suspected cases in working place whereas their study population were from addiction treatment centers or addicts selected by snow ball sampling method.

Ahad et al. study reported that the commonest addiction were to cannabis (95.24%) followed by yaba (61.9%), barbiturates and tranquilizers (50%), alcohol (47.62%), phensedyl (42.33%), opiate (injection pethidine /morphine) (19.05%), costly cocaine (7.14%), opium (2.38%) and others (2.38%).[6] Our findings were almost similar to their study findings except we did not include alcohol as a substance disorder and our study population wasn't detected for abuse of phensedyl and cocaine. This lab based study did not consider the history of drug abuse by the study subjects was a limitation of this study.

Conclusion

This lab based study found most of the abusers were young individuals, who represented the future generation of society, was a warning sign for us. Abusing illicit drugs by the young generation will cause remarkable loss in physical, psychological, moral and social integrity that demands immediate attention. Parents, educational institutes, health professionals particularly psychiatrists, state rules and concerned departments have to take care more stringently to protect our future builders and to get rid of drug trafficking and abuse. Healthy recreation facilities, quality time to children by the parents, mental health follow up in academic institutes, social awareness against the addiction and more research related to drug addiction and its abolition are now the demand of the time.

References

1. World Health Organization Lexicon of alcohol and drug terms. Geneva: World Health organization; 1994.
2. Gupta S, Sarpal SS, Kumar D. Prevalence, pattern and familial effects of substance use among the male college students- A north Indian study. J Clin Diagn Res 2013;7(8):1632-6.

3. Dope test made mandatory for govt jobs [Online]. 2018 Dec 9 [cited 2019 Aug 20]; Available from: https://www.dhakatribune.com/bangladesh/government-affairs/2018/12/09/dope-test-made-mandatory-for-govt-jobs
4. Shazzad MN, Abdal SJ, Majumder MSM, Sohel JUA, Ali SMM, Ahmed S. Drug Addiction in Bangladesh and its Effect. Medicine Today 2013;25(2):84-9
5. Zaman B, Ahmed SM, Hossain MM, Kamal MM. Psychosocial illness among the drug abusers undergoing detoxification in Dhaka, Bangladesh. South East Asia J Public Health 2014;4:36-41.
6. Ahad MA, Chowdhury DM, Islam MB, Alam MF. Socioeconomic Status of Young Drug Addicts in Sylhet City, Bangladesh. IOSR J Humanit Soc Sci 2017;22: 84-91.
7. Kamal M, Huq N, Mali B, Akter H, Arafat SMY. Epidemiology of Substance Abuse in Bangladesh: A Narrative Review. J Ment Disord Treat 2018;4:165.
8. Moeller KE, Kissack JC, Atayee RS, Lee KC. Clinical Interpretation of Urine Drug Tests: What Clinicians Need to Know About Urine Drug Screens. Mayo Clin Proc 2017;92(5):774-96
9. Mohit MA. Diagnosis of patients attending outpatient department (OPD) of NIMH. Bang J Psychiatry 2001;15(1):5-12.
10. Fahmida A, Wahab MA, Rahman MM. Pattern of psychiatric morbidity among the patients admitted in a private psychiatric clinic. Bang J Med Science 2009;8(1):23-8.
11. Maruf MM, Khan MZR, Jahan N. Pattern of Substance Use: Study in a De-addiction Clinic. Oman Med J 2016;31:327-31.
12. Mohiuddin AK. Drug Addiction in Bangladesh: A Consequence of Social Demoralization Rather than Individual Flaws. ARC Journal of Addiction 2019;4(1): 19-26
13. Ahmed F, Ahmed S. The Impact of Drug Addiction Among the Students of Tertiary Level in Bangladesh. Journal of Education and Practice 2019;10(7):17-21.