

A Comparison of the Efficacy of Different Forensic Methods in Detection of Narcotic Substances from Blood and Urine Samples by Rapid Antigen Test Kit

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Abstract

Original Research Article

Introduction: Bangladesh is the most vulnerable country for narcotic drug addiction which is rising at alarming rate and spreading all over the country. These drugs cause serious health injuries to our young generation and child abusers. Our society is facing adverse effects due to drug addiction such as killing, hijacking, raping, western party celebrations etc. Department of narcotic drug control agency seized them every month which includes Heroin, Phensedyl (Codeine preparations), intravenous Morphine, Pethidine, Diazepam, Bromazepam, Yaba (Methamphetamine, Amphetamine with caffeine) and energy drinks containing sildenafil citrate and tadalafil citrate substances. Most of the addicted people are multiple drug users. So these substances should be detected by a rapid, reliable and cost effective method. The aim of the study was to understand the cause and risk factors of drug abuse. **Methods:** This cross-sectional analytical study was conducted at the outpatient department of Rajshahi Medical College Hospital, Rajshahi, Bangladesh during the period from July 2019 to July 2020 with a responsive sample size of 36. Data was analyzed using Microsoft Excel. During study the ethical clearance was obtained from proper authority. Clearance regarding handling of narcotic samples was also taken from the Ministry of Home Affairs. **Result:** This study was conducted with a responsive sample size of 36. Of the total 36 samples, 34 were cases and 2 were controls. Post analysis of the used drugs pattern showed that 8.33% of cases used Benzodiazepine+Opioid+PCP, 8.33% of cases used Cocaine+Opioid+THC, 25% of the cases used Opioid+THC, 8.33% cases used BZD+Cocaine+Opioid+THC, 25% cases used BZD+Opioid+THC, 8.33% of cases used Cocaine+Opioid and the rest 16.67% were control and tested negative at the time of data collection. **Conclusion:** Sources at the department of narcotics control intelligence wing also said that around 10,000 cases are filed and 9,000 people are arrested every year in connection with drug-related violence and crimes. In the present, people are using multiple drugs rather than a single substance. For the rapid detection of drug of abuse the method of priority should be rapid blood sample test by kit to avoid unwanted tempering and a reliable result.

Keywords: Rapid drug test, Drug of abuse; Strip test; Rapid blood detection; Blood test kit.

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INTRODUCTION

Drug addiction is not a recent issue in Bangladesh. Although the department of narcotics and liquor was established in 1989 primarily for tax collection from domestically produced narcotics, it was converted into a narcotics control department in 1990 to combat drug abuse, smuggling, creating mass awareness, treatment and rehabilitation of affected people. In 2019 police seized 1379 kg of heroin, 2015 bottles of codeine (phensedyl), 15023 kg of cannabis and 21470 pieces of yaba [1]. Multiple drug use has aggravated the overall

situation affecting our personal, economic, social life and impairing health status. It is estimated that near about 6 million people in Bangladesh are drug addicted and about 80 percent of the drug addicts are adolescents and young men of 15 to 30 years of age [2]. The Drugs (Control) Ordinance, 1982 is an ordinance, which was declared in order to control, manufacture, import, distribute and sell drugs [3]. Recently, the Narcotics Control Bill, 2018 has been passed in parliament. This bill has been passed with a provision of death sentence or life imprisonment as punishment for producing, trading and using 200 grams or more 'yaba' or more than 25

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grams of 'heroin' and 'cocaine'. If a person carries, trades, stores or processes 'yaba' weighing less than five grams, he or she could be sentenced to five years in jail and fined. One could be sentenced to death for carrying, trading, storing or processing 'yaba' weighing over five grams according to this bill. People in possession of less than 25 grams of 'heroin' and 'cocaine' could be punished with two to ten years' imprisonment. If they have more than 25 grams, the punishment could be death or life imprisonment. In the existing law, there is no provision for death sentence or life imprisonment for offenses related to heroin and cocaine. The maximum punishment is 15 years [4]. The commonly used drugs included Barbiturate/sedatives 32(56.14%), Yaba-28(49.12%) and Toluene/aica 22(38.59%), Most of the drug addicts (84.21%) used oral route. Place of drug addiction included dance bar/club house 18(31.58%), isolated room/mess 14(24.56%), open field 12(21.05%), railway/bus station 9(15.79%) and other place 4(7.02%). Drug abuse is a dreadful threat in the society with biological, social, financial, psychological and security effect on the individuals, families and the community [5].

OBJECTIVE

General Objective

- To determine the cause of drug abuse.
- To determine the risk factors for drug abuse.

Specific Objectives

- To observe the pattern of test results obtained from urine and blood samples.

METHODS

This descriptive cross sectional study was performed at the outpatient department of Rajshahi Medical College Hospital during July 2019 to July 2020 under the close supervision of Institute of Biological Sciences, Rajshahi University. Initially 30 people were enrolled but 12 people participated in the sample collection. So the response rate is 40%. A total of 20 samples from 10 habitual drug addicted young people aged 15 to 35 years and 4 samples from 2 controls were collected by a purposive and convenient method of sampling. The primary urine and blood samples were collected by repeated visits to hospital and face to face interview with addicts and their family members using a pretested semi structured questionnaire containing both closed and open ended query. Collected samples were tested by a rapid urine test kit and analyzed.

RESULTS

This study was conducted with a sample size of 36. Of the total 36 samples, 34 were cases and 2 were controls.

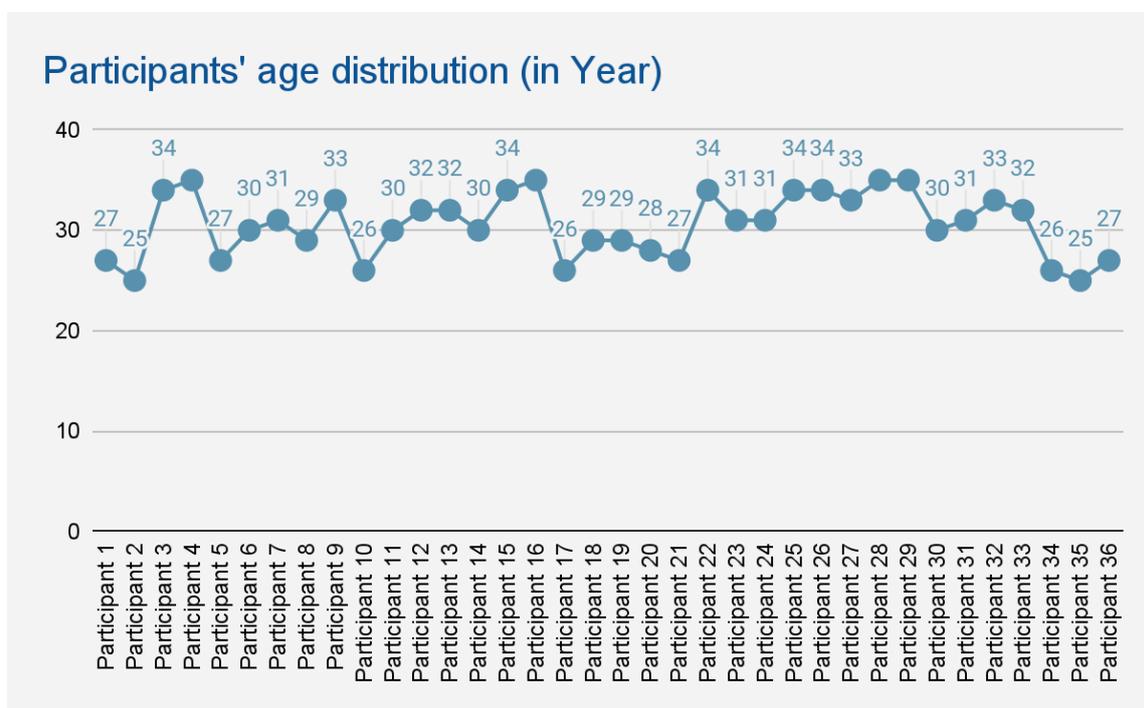


Chart 1: Age distribution of the study population

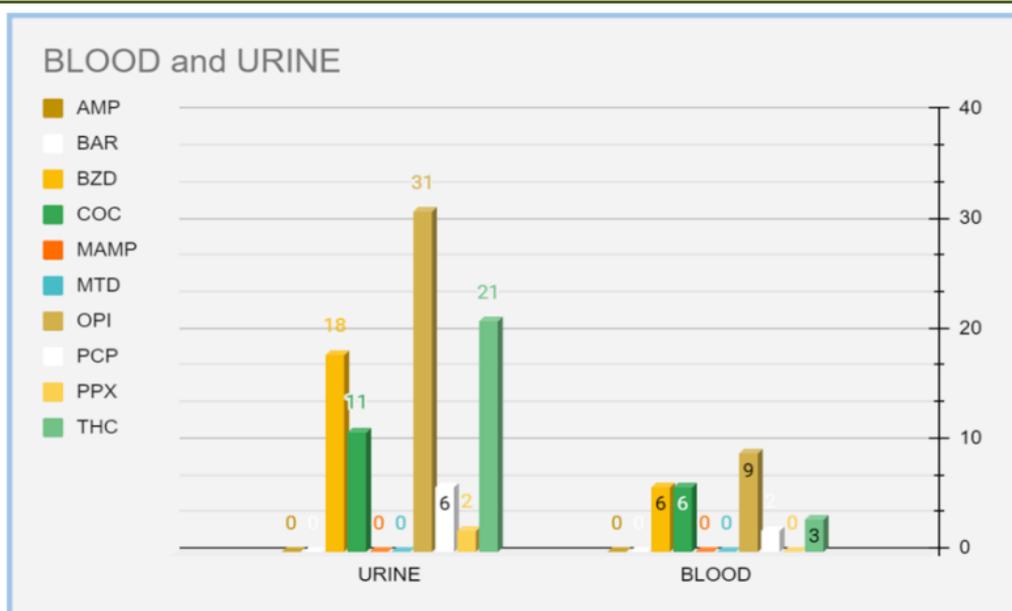


Chart 2: Pattern of the used substances

Post analysis of the used drugs pattern showed that 8.33% of cases used Benzodiazepine+Opioid+PCP, 8.33% of cases used Cocaine+Opioid+THC, 25% of the cases used Opioid+THC, 8.33% cases used BZD+Cocaine+Opioid+THC, 25% cases used BZD+Opioid+THC, 8.33% of cases used Cocaine+Opioid and the rest 16.67% were control and tested negative at the time of data collection.

Table 1: Pattern of single drug use

Sample	Positive	Negative	Total
URINE	33	3	36
BLOOD	21	15	36

Table 2: Pattern of the samples that are tested positive

Sample type	n=36	Positive	(N %)
Blood	36	18	50%
Urine	36	30	83.33%

After the data collection was conducted, 50% of the blood samples were tested positive while 83.33% of the urine samples found positive.

Table 3: Single substance and multiple substance use pattern in the study population

Criteria	n=36	(N %)
Single substance use	0	0%
Multiple substance use	30	83.33%
No substance use	6	16.67%

Single and multiple substance use were determined. Looking at the available data to determine anything more about the pattern of drug use, we can see that 83.33% of the cases had multiple drug use history. 16.67% had no history of addiction. But not a single case was found who used a single drug only.

DISCUSSION

Bangladesh, though not a drug producing country has now become a victim of drugs. The international narcotics producing zone, Golden Crescent, consisting Pakistan, Afghanistan and Iran is located in its north-west of our country and the Golden Triangle consisting of Myanmar, Laos and Thailand is located at its south-east corner. The experts in this field consider this geographical location, close proximity of drug producing zones, in-transit use of the country for international drug trafficking. Rapid urbanization, increase of population, vast development and use of internet and IT, lack of social awareness etc are also responsible for the increase of drug problem in Bangladesh [6]. It is estimated that over Tk 70 million every day are spent on illegal narcotics [7]. Male get involved in drug addiction due to the employment crisis, frustration and failure in academic performance. The numbers of female drug users are also increasing in our country. It is shown that the rate of female drug addicts is increasing due to family feud, frustration caused by failure in love and jobs, bad company and curious female students are taking drugs out of fantasy when they are engaged in gossiping with their friends on the college or university campuses. According to government and non-government sources at least 1 lakh and 50 thousands women are drug addicted, 90 percent of them are young people between ages of 18 to 25 years [8]. The drug addicts are considered as a burden to the family. The young population drops out from school/college or university education. The service holder loses his job because of irregularities, less attentiveness to office work and antisocial behavior. The Multi-Drug Test Kit is an immunoassay based on the principle of competitive binding. Each drug test panel is designed to a sensitivity level known as a cut-off point. This means that if the result is negative, it could indicate no drugs are present or the drug concentration is below the cut-off point.

Please also note that a number of factors could influence the results, for example the individual's drug absorption rate, metabolism rate, distribution in the body, excretion rate, drug quantity and drug quality. To detect drugs in the urine, it must be absorbed, circulated in the blood and deposited in the bladder. This process takes a few hours for most drugs. Thus, an individual who was tested just 15 or 20 minutes after using drugs would probably get a negative result unless they were a frequent user with drug residue in his/her urine. Frequent users of marijuana, for example, may test positive for marijuana several months after use [9]. Detection of Narcotic drugs from centrifuged blood samples could improve the state of the entire justice system. Establishment of drug of abuse (DOA) kits as a potential technique for the detection of narcotic drug substances obtained from blood and urine samples will be a reliable, robust and cost effective technique.

LIMITATIONS OF THE STUDY

The study was conducted in a single hospital with a small sample size. So, the results may not represent the whole community.

FUNDING

No funding sources.

CONFLICT OF INTEREST

None declared.

ETHICAL APPROVAL

The study was approved by the Institutional Ethics Committee.

RECOMMENDATION

The dangers of drug addiction have affected all class populations of our country. Urine samples are more convenient to acquire but it may exert false positive results. Though the blood sample collection requires a trained person, its reliability is more. Preventive measures for drug smuggling and addiction are needed to be taken. More drug addiction treatment and rehabilitation centers are required to combat the present situation.

CONCLUSION

The study shows that 50% of the blood samples were tested positive while 83.33% of the urine samples found positive by Rapid antigen test kit. Apparently it seems that urine samples have higher positive detection rate than that of blood samples. It should be confirmed by the Liquid Chromatography Mass Spectroscopic analysis (LP-MS).

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