

Addiction Disorders and Therapy

Original Article

Evaluation of abuse drugs tests variations in fresh biological samples of abusers

Majid Rezaei Basiri^{1,2,5*}, Mojgan Behshid^{2,3}, Ghazi-khansari⁴, Saleh Alilou⁵, Haniyeh Mohebbi-Kamali⁵, Valiyollah Watani⁵, Mehdi Pakdel-Samadi⁵, Ladan Aminzadeh⁵, Fatemeh Seyed Nejad⁵, Marziyeh Mokhtari⁵, Fatemeh Hosseindoust⁵, Ashraf Razavi⁵, Ligha Saadat⁵

¹Department of pharmacology and toxicology, School of Pharmacy, Tabriz University of medical sciences, Tabriz, Iran.

²Medical education research center, Tabriz University of Medical Sciences, Tabriz, Iran.

³Department of Medical Surgical, School of Nursing and Midwifery, Tabriz University of Medical Sciences, Tabriz, Iran.

⁴Pharmacology departments of medicine faculty, Tehran medical sciences university.

⁵Welfare organization of East Azarbayjan, Tabriz, Iran.

Corresponding author: Dr. Majid Rezaei Basiri, Bsc, Msc, PhD of Toxicology, Soleyman khater Avenue - Tabriz welfare organization of East Azarbayjan, Tabriz, Iran, Tel: +98 9354235863; Email: basiri@alumnus.tums.ac.ir

Received Date: 01-29-2019

Accepted Date: 02-06-2019

Published Date: 02-12-2019

Copyright: © 2019 Majid Rezaei Basiri

Abstract:

Background and Aim: In this study N=450 fresh blood and urine samples of male abusers were employed to distinguish abuse drugs and some treatment drugs. All of the study population were male and their age range was Mean \pm SD = 40 \pm 20. All study population filled satisfy form to participating in study.

Methods: Some of abuse drugs were distinguished in this study which were Heroin, Morphine, Cannabis, Methadone, Tramadol, Beprexin, Amphetamine, Metamphetamine, MethylenDioxy metamphetamine, Cocaine, Phencyclidine, Benzodiazepine, Three cyclic antidepressant, Phenobarbital... The diagnosis tests methods were determined by abusers' dependency on treatment conditions. All data were collected and analyzed by one-way ANOVA and t-test before and after detoxification.

Results: When comparing the test results p-value $0 \geq 0.05$ was considered as significance level. Treatment duration follow-up of all blood and urine samples of the abusers indicated negative results. The results of this study showed that the blood samples of abusers are suitable to indicating positive results.

Conclusion: According to the findings of the present investigation rapid strip tests were useful in blood samples and TLC was accessible confirmation method to abusers' urine samples. We purpose that this method will be suitable to distinguish of abuse drugs in other biological samples in future.

Keywords: Abusers; Fresh Biological Samples; Rapid Strip Tests; Detoxification; Thin Layer Chromatography

Introduction

Today, addiction epidemic has changed to serious social challenge and problem even in developed countries and in the poor societies social damages are consequences of increased addicted population. Statistical studies and appropriate treatment and diagnosis methods will be highly efficient in line with prevention of increasing addicted population. Scientific progress and advent of new sciences have resulted in production of new kinetic addictive substances in industrial communities. This is while during recent decades' addiction epidemic used to involved traditional substances such as opium. Different studies have been conducted in western and weak countries in line with diagnosis, treatment and prevention of traditional and industrial addictive substances and still they are conducted currently. It seems that fast and cost-effective methods are important in addiction control and inhibition process. Based on new studies, use of fresh biologic sample of the addicted people has been proposed [1,2,3]. Hence, employment of the above mentioned methods specially in developing and highly populated countries will be cost effective. Use of advanced experimental tools is essential in additives and abuse drugs diagnosis; however, they are not economically available all the times. Hence and according to what was mentioned earlier we propose use of initial facilities such as Immuno-chromatography diagnosis strips as effective in blood and urine samples and then layer chromatography as effective in urine samples diagnosis and then we develop the research procedure and framework based on them [1,2,3,4,5].

Methods and materials

In this research study a number of 450 male addicts who had addictive substances and drugs abuse such as opium, heroin, methadone and cannabis were selected and above mentioned substances abuse form along with research participation consent form were filled for them. Each addicted subject was asked to give a fresh sample of his blood and urine to the laboratory before detoxification. Blood samples were centrifuged (4000 prm) for four minutes and then the supernatant liquid (i.e. blood

serum) was isolated to do the tests. Some of abuse drugs were distinguished in this study were Heroin, Morphine, Cannabis, Methadone, Tramadol, Beprexin, Amphetamine, Metamphetamine, MethylenDioxy metamphetamine, cocaine, Phencyclidine, Benzodiazepine, Three cyclic antidepressant, Phenobarbital... The blood serums were tested by rapid strips, sensitivity of which is 300 Ng/ml to abuse drugs and then the results were recorded. In this study, some blood and all of the urine samples of addicts who were detoxified without using drug were tested after improvement using above-mentioned method and the results were recorded after treatment. Moreover, for detoxification confirmation all urine samples after treatment were tested by thin layer chromatography and their results were recorded, too. In this research, all male addicts participating in the study gave about 100cc urine sample and 100cc of fresh blood sample to the laboratory for being tested before and after treatment [1,2,3]. All of the addicts had smoking, alcohol, pain-relief and sedative medicines history. Majority of the addicts had relatively long history of using addictive substances or drugs for more than five years. Some biochemical tests such as liver enzymes experiments were conducted on the blood samples of the study additives and then their results were recorded. Moreover, some studies were also carried out to investigate anemia level of the addicts. Results of all above-mentioned tests have been shown in the table 4 [1,2,3,4,5,6,7].

Results

In this research all data were obtained from questioners and related tests results. Table 1 shows number of some of the drugs along with tested abuse drugs among the study addicts. As it can be seen in the table use of addictive substances such as heroin, opium and grass drugs is becoming prevalent. Table 2 shows number of positive and negative results of prevalence of addictive substances (e.g. heroin, opium and grass drugs...) based on the addicts age and use history before detoxification and after treatment among urine samples and according to the chromatography tests. Table 3 shows number of positive and negative results of prevalence of some drugs and addictive substances in

the addicts' blood samples before detoxification and after treatment among their blood samples based on rapid strip diagnosis tests. Table 4 shows confirmatory tests results and drug interventions in the urine samples of the addicts with heroin, glass and opium use after detoxification and treatment period based on doing thin layer chromatography. In this study after data collection, results were compared before and after detoxification periods and then one-way ANOVA and t-test statistical analyses were conducted on the data and finally $p \leq 0.05$ was considered as significant for all statistical population [6,8,9,10,11,12,13,14].

Discussion

According to these study abusers who chronically and persistently consume abuse drugs or other treatments so these substances and medications will found in their body biological fluids, and then the searching of these

drugs in their body fluids are often accessible. clinical situation and selection of drug treatment and distinguish methods are varied in different countries of the world [1,2,3,4,5,6,7,8,9,10,11,12]. According to clinical situation of abusers and facilities in different countries of middle east such as Iran, diagnostic and treatment in these regions are different. Because it might be in the abusers' urine samples positive and false negative results can be found so Using blood samples are suitable to diagnose and confirm the presence of addictive drugs. because Nowadays we need the alternative and rapid and cheap fecible methods to distinguishing of over dose drugs are in drug poisoning in drug abuse treatment clinics and other hospitals and forensic medicine [14,15,16,17,18,19]. This study recommends that without using other complicated instruments the detection and diagnosis of other medicinal or drugs poisoning with Rapid strip test kits with above 300 ng/mL sensitivity are usefulness in biological samples such as blood samples in

Table 1: Shows number of some of the abuse drugs along with tested between the study population.

No	Drug names Abuse drugs	Men Ages Mean Mean±SD	Consumption history month or year	Abuser numbers N
1	Herion	55	2yr	n=450
2	Metamphetamine	44	3 yr	n=450
3	Opium	41	2 yr	n=450
4	Methadone	40	1yr	n=450
5	THC	40	4 yr	n=450
6	Bupernorphine	30	1yr	n=450
7	Codein	60	5yr	n=450
8	BNZ	59	5yr	n=450
9	TCA	32	10month	n=450
10	BAR	31	2yr	n=450
11	AMP	35	1yr	n=450
12	TML	58	4yr	n=450

Ages mean>20,N=450,BNZ:Bezodiazepines,TCA:Three cyclic antidepressants,BAR:Barbiturates,AMP:Amphetamine,TML:Thramadol

Table 2: Urine rapid strip test results during the period of before and after detoxification in population study of men groups.

No	Men	Men	Con- sumption history month or year	Before detox- ification	After detoxi- fication
				>300ng/ml	<300ng/ml
1	60	60	20yr	+	-
2	59	59	30yr	+	-
3	58	58	20 yr	+	-
4	57	57	18yr	+	-
5	55	55	24 yr	+	-
6	50	50	19yr	+	-
7	49	49	15yr	+	-
8	44	44	13yr	+	-
9	41	41	14yr	+	-
10	44	44	20yr	+	-
11	40	40	16yr	+	-
12	39	39	44yr	+	-
13	58	58	15yr	+	-
14	42	42	15yr	+	-
15	39	39	11yr	+	-
16	30	30	9yr	+	-
17	31	31	16yr	+	-
18	33	33	13yr	+	-
19	39	39	18yr	+	-
20	30	30	9yr	+	-
21	35	35	18yr	+	-
22	35	35	13yr	+	-
23	30	30	18yr	+	-
24	45	45	9yr	+	-
25	45	45	18yr	+	-
26	43	43	14yr	+	-
27	44	44	7yr	+	-
28	56	56	3yr	+	-
29	31	31	5yr	+	-
30	31	31	22yr	+	-
31	32	32	20yr	+	-
32	60	60	15yr	+	-
33	55	55	10yr	+	-
34	46	46			
35	46	46			

>300ng/ml: positive results (+), <300ng/ml: Negative results (-) N=450, Rapid strip test, Abuser drugs(AM, MA, Methadon, Canabinoid, tramadol, opioums,...) detection in men abusers Urine samples. Anowa two way, p=0.0001

Table 3: Rapid strip tests results of Blood samples during before and after detoxification

No	Men	Con- sump- tion history month or year	Before detoxi- fication	After detoxifi- cation
	Age		>300ng/ml	<300ng/ml
1	60	20yr	+	-
2	46	30yr	+	-
3	45	20 yr	+	-
4	41	18yr	+	-
5	39	24 yr	+	-
6	30	19yr	+	-
7	37	15yr	+	-
8	38	13yr	+	-
9	32	14yr	+	-
10	30	20yr	+	-
11	31	16yr	+	-
12	36	44yr	+	-
13	39	15yr	+	-
14	40	11yr	+	-
15	42	9yr	+	-
16	40	16yr	+	-
17	45	13yr	+	-
18	49	18yr	+	-
19	50	9yr	+	-
20	37	18yr	+	-
21	39	14yr	+	-
22	36	7yr	+	-
23	32	3yr	+	-
24	35	5yr	+	-
25	35	22yr	+	-
26	39	20yr	+	-
27	38	15yr	+	-
28	30	10yr	+	-
29	30	13yr	+	-
30	59	17yr	+	-

>300ng/ml: positive results (+), <300ng/ml: Negative results (-) N=450, Rapid strip test, opiod (Heroin, opium, Methadone, Codein, cannabis, Metamphetamine) detection in abusers Blood samples. Anowa one way, p=0.0001

Table 4: Urine test results have shown drug interaction after detoxification process of some cases.

No	Women	Women	Consumption	Drug interac-
	Age	Age	history	tions
			month or	>300ng/ml
			year	
1	49	55	2yr	±
2	48	44	3 yr	±
3	46	41	2 yr	±
4	44	40	1yr	±
5	41	40	4 yr	±
6	25	30	1yr	±
7	49	60	5yr	±
8	50	59	5yr	±
9	21	32	10month	±
10	22	31	2yr	±
11	24	35	1yr	±
12	50	58	4yr	±

Age>35yr, N=12, Drug interactions have after detoxification through TLC (Thin layer chromatography) method.

hospitals and forensic medicines. Table3 clearly showed importance of rapid strip tests results in blood samples of abusers in this investigation [1,3,7,8]. However according to these study findings the use of TLC (thin layer chromatography) is very suitable to confirm of drug interactions in urine samples of abusers. Some of these studies demonstrate useful results for long-term treatment of methadone and buprexin and other medications such alcohol, opiates, methamphetamine... in abusers. In the all of clinical diagnostic laboratory centers such as addiction rehab centers undervision of welfare organization and addiction clinics and psychiatric hospitals, clinical laboratories, pharmaceutical laboratories of toxicology and forensic departments routinely use from liquid phase and solid phase extraction techniques to distinguish drugs abuse such as opioids in urine samples by the thin layer chromatography (TLC), and serum titers of some other blood parameters showed normal or dysfunction of all abusers liver and their renals's through application of clinical laboratory tests methods in Iran [14,18,19,20,21,22].

Conclusions

Depending on the strategy for the treatment of abusers' buprenorphine and methadone maintenance therapy are used. Always blood and urine tests will be positive for these substances duration of MMT course and so their abuse conditions or their detoxifications. We conclude that between all drugs progressive analytical methods the cheapest and easiest tests of opioids and other drugs in urine and blood samples is strip test for rapid diagnosis and TLC (thin-layer chromatography) is accessible method to drugs abuse detection, also doing test on blood samples have importance to immediate distinguishing of drugs abuse and other drugs poisoning in clinical laboratories. The essential function of Rapid strip test kits is Immunochromatography. They are made and accessible and cheaper than other methods in Iran [3,18]. According to background of this study, which will be recommended that to detection and diagnosis of other medicinal or drugs poisoning using of blood samples and rapid strip test kits with sensitivity above 300 ng/mL are available [11,13,14,17].

Acknowledgment

We acknowledge that all abusers to participation of them in this investigation. We have special thanks of from all clinics that work undervision of welfare organization. We are grateful from Tabriz/Iran welfare organization to financial support of this study.

References

- [1] Cone EJ, Dickerson S, Paul BD, et al. Forensic Drug Testing for Opiates. IV. Analytical Sensitivity, Specificity, and Accuracy of Commercial Urine Opiate Immunoassays. *J Anal Toxicol* 1992; 16 (2): 72-78.
- [2] Rezaei-Basiri M, Ghazi-Khansari M, Faghieh A, et al. Screening of Morphine and Codeine in Urine of Opioid Abusers by Rapid and TLC Analysis *EJGM* 2011; 242-246.
- [3] Rezaei-Basiri M, Rezazadeh H, Asvadi-Kermani I, et al. Antimutagenic Effects of Vitamin E on Oncology and Non Oncology Hospital Nurses by Comet Assay. *Drug Res* 2014; 64(7): 337-342.
- [4] Rezaei Basiri M, Ghazi-Khansari M, Behshid M, et al. Distinguishing of Abuse Drugs in Urine and Blood Samples of Abusers in Iran. *Journal of Pharmacy and Pharmacology* 2015; 385-390.
- [5] Pergolizzi J, Pappagallo M, Stauffer J. The Role of Urine Drug Testing for Patients on Opioid Therapy. *Pain Pract* 2010; 10(6): 497-507.
- [6] Majid RB, Rezazadeh H, Asvadi-Kermani I, et al. Effect of Vitamin E on Uroepithelial Cells and Changes of Urinary Sediments in Oncology Hospital Nursing Personnel. *J Clin Diagn Res* 2013; 7(11): 2570-2572.
- [7] Al-Saffar Y, Stephanson NN, Beck O. Multicomponent LC-MS/MS screening method for detection of new psychoactive drugs, legal highs, in urine—Experience from the Swedish population. *J Chromatogr B Analyt Technol Biomed Life Sci* 2013; 930: 112-120.
- [8] Grönholm M, Lillsunde P. A Comparison between on-site Immunoassay Drug-Testing Devices and Laboratory Results. *Forensic Sci Int* 2001; 121(1-2): 37-46.
- [9] Pragst F, Balikova MA. State of the Art in Hair Analysis for Detection of Drug and Alcohol Abuse. *Clin Chim Acta* 2006; 370(1-2): 17-49.
- [10] Verstraete AG. Detection Times of Drugs of Abuse in Blood, Urine, and Oral Fluid. *Ther Drug Monit* 2004; 26(2): 200-205.
- [11] Dettmeyer R, Friedrich K, Schmidt P, et al. Heroin-associated myocardial damages--conventional and immunohistochemical investigations. *Forensic Sci Int* 2009; 187(1-3): 42-46.
- [12] Baj J, Radzikowska E, Maciejewski M, et al. Prediction of acute pancreatitis in the earliest stages - role of biochemical parameters and histopathological changes. *Pol Przegl Chir* 2017; 89(2): 31-38.
- [13] Bosker WM, Huestis MA. Oral Fluid Testing for Drugs of Abuse. *Clinical Chemistry* 2009; 55(11): 1910-1931.
- [14] Hackett LP, Dusci LJ, Ilett KF. Optimizing the Hydrolysis of Codeine and Morphine Glucuronides in Urine. *Ther Drug Monit* 2002; 24(5): 652-657.
- [15] Wille SM, Raes E, Lillsunde P, et al. Relationship between Oral Fluid and Blood Concentrations of Drugs of Abuse in Drivers Suspected of Driving under the Influence of Drugs. *Ther Drug Monit* 2009; 31(4): 511-519.
- [16] Boelaert M, Bhattacharya S, Chappuis F, et al. Evaluation of Rapid Diagnostic Tests: Visceral Leishmaniasis. *Nature Reviews Microbiology* 2007; 30-39.
- [17] Moeller KE, Lee KC, Kissack JC. Urine Drug Screening: Practical Guide for Clinicians. *Mayo Clin Proc* 2008; 83(1): 66-76.
- [18] Brown LR, Edelman E, Tseng D. Extraction through the Skin or Hair Using a 2-Pyrrolidone in a Carrier; Drugs of Abuse, Caffeine, Prescription Drugs, eg. Acetaminophen, Metabolic Analytes, eg., Blood Glucose and Heavy Metals, eg. lead, lithium, copper and iron, US Patent 6492180 B2, filed Jun 24, 1999, and issued Dec 10, 2002.
- [19] Mokri A. Brief overview of the status of drug abuse in Iran. *Arch Iranian Med* 2002; 184-190.
- [20] Juhascik MP, Jenkins AJ. Comparison of liquid/liquid and solid-phase extraction for alkaline drugs. *J Chromatogr Sci* 2009; 47(7): 553-557.
- [21] Dolan K, Rouen D, Kimber J. An overview of the use of urine, hair, sweat and saliva to detect drug use. *Drug Alcohol Rev* 2004; 23(2): 213-217.
- [22] Jelkmann W. Regulation of erythropoietin production. *J*

Physiol 2011; 589(6): 1251-1258.

behaviors and drug abuse: impulsivity and its assessment.

[23] Dougherty DM, Mathias CW, Marsh DM, et al. Suicidal

Drug Alcohol Depend 2004; 76: 93-105.