

Methamphetamine abuse in former opiates addicts currently in methadone maintenance treatment in Iran

Simasadat Noorbakhsh^{*1}, Mahdie Roohi², Hedio Farrahi³

¹ . M.Sc. Behavioral Sciences Research Center of Shahid Beheshti University of Medical Sciences, Tehran, Iran.
(Corresponding Author: Sima.nourbakhsh@gmail.com)

² . M.Sc. Behavioral Sciences Research Center of Shahid Beheshti University of Medical Sciences, Tehran, Iran.

³ . M.Sc. candidate. Islamic Azad University Central Tehran Branch, Tehran, Iran. Farrahihedie@gmail.com

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Abstract

Background: To measure suspected abuse of the methamphetamine (MA) among methadone maintenance treatment (MMT) patients in Tehran, we studied all 206 patients who were admitted to MMT program from 2009 to 2015 to Andishe-No addiction treatment clinic.

Methods: MA presence was screened in one of the random urine samples routinely taken for tests of other drugs.

Results: 70 (34.3%) patients were positive for MA. A logistic regression (multivariate analyses) demonstrated that the MA abusers were more likely to be opiate abusers and less likely to be married.

Conclusion: The high prevalence of MA abuse found in our patients which was rather higher than the rate of MA abuse before treatment entrance. The high rate of MA abuse in Iran needs future study

Declaration Interest: None.

Keywords: Methamphetamine Abuse, Opiates Addicts, Methadone Maintenance Treatment, Iran.

Introduction

Addiction has always been one of the major concerns of every country's health systems and different societies tried to resolve it in many ways, such as prison, execution, fighting with manufacture and trade illegal drugs, medical and non-medical treatments, etc. (1). Based on global estimation in 2008, 150-250 millions of people (3.5-5.7% of world population) had at least tried one illegal drug during life-long, among whom 16-38 million were "problem drug user" (2).

World Health Organization (WHO) and American Psychiatric Association (APA) defined addiction as a chronic disease and related problem with severe craving to drugs and tolerance (3).

Researches indicated that using multi drugs is a severe barrier to successful intervention Treatment process would be much more complicated if the patient uses two or more types of drugs (4, 5). Methamphetamine (MA) is the most popular drug after cannabis in the world (6).

During the last decade, health services in Iran have expanded methadone maintenance treatment (MMT) all over the country. As opiates had been the drug of choice of the vast majority of drug users in Iran, MMT program was successful and promising in the drug use treatment network (7). Before 2005, there was no available MA in Iranian drug market, although it has been used in many countries in the past 20 years (8). An increase was observed in MA use among MMT patients who were stimulant-naïve and passed a successful MMT period (9, 10). Some reasons were proposed for this problem such as side effects of methadone on mood and energy level, sexual dysfunction and physical activity. Then many patients prefer combination of methadone and MA. Using both drugs at the same time cause an increase in extracellular synaptic dopamine level which is much greater than only one drug (11). By MA abuse in patients during MMT, clinicians are faced a new, unknown situation

which can reduce the effectiveness of MMT program.

Cooperation level and maintenance of patients in long-term treatment plans such as MMT is one of the most vital challenges clinicians are faced with. One of the disturbing items during MMT is using MA in addition to methadone. In this state, it is important to know the rate of MA relapses during MMT in patients who mostly had no experience of stimulants use before starting MMT. Thus, the aim of this study is to evaluate the percentage of MA use during MMT in addicts.

We found that MA was abused among MMT patients in our addiction treatment clinic based on some of patients' self-reports and clinical assessment of symptoms. Since this may have severe clinical implications for the MMT program, we decided to assess the prevalence of MA abuse among all patients treated from 2011 to present in the Andishe-No MMT Clinic in Tehran (Iran).

Methods

This analysis was approved by the Ethical Review Board of the Behavioral Sciences Research Center of Shahid Beheshti University of Medical Sciences (ref: 1392-1-91-12607-1). The Andishe-No addiction treatment center, admitted 206 patients from 2009 who met criteria for entering methadone maintenance treatment (DSM-IV criteria of dependence with multiple self-administrations of opiates per day for at least one year).

Patients in MMT undergo repeated observed urine tests throughout the entire length of their treatment. For the purposes of this study, MA was determined for each patient (methamphetamine [MET]) that are taken during one month randomly for morphine (MOP) and cannabis (THC). A positive result was defined by at least one of the urine samples testing positive for the substance.

A modified addiction severity index (ASI) and other demographic details were retrieved from the patients.

The patients included in the study were chosen among those who were in treatment in the Andishe-No clinic admitted from 2009 to 2015.

1. A DSM-IV-TR diagnosis for narcotics dependence;

2. Being in methadone maintenance treatment; and
3. Patient did not refuse to give urine for test.

The sample consisted of 206 patients. Their mean age was 45 years (range 18-72). The majority was male (199, 96%); married (115, 56%), had relatively medium educational levels (11 yrs.), and were employed (176, 81%). At the time of the study the mean of treatment duration was over 2 years. For 61 (30%), this episode was their first treatment attempt.

All patients entering treatment have an assessment performed, which includes socio-demographic data, addiction history, medical, and psychosocial related variables by Addiction Severity Index (ISI).

A modified Addiction Severity Index (ASI) and other socio-demographic details were retrieved from the patients' records that are part of the routine intake upon entry to the clinic, including lifetime psychiatric diagnoses, drug abuse history, etc.

1) Addiction Severity Index: ASI is a semi-structured interview for substance abuse assessment and treatment planning (12). The ASI was the first standardized assessment tool of its kind to measure the multiple dimensions of substance abuse. It has three categories: 1) socio-demographic: gender, age, years of education, and main source of income; 2) consumption: main substance, type of treatments, years of consumption; and 3) severity of dependency. Overall, studies typically conclude that the Addiction Severity Index is a consistent and accurate tool for assessing clients and their substance abuse issues. The ASI is able to successfully identify the client's problem area in which they are experiencing the greatest difficulties, such as alcohol or drug addiction, or legal or familial problems. Once a client's psycho-social issues are identified, an appropriate course of treatment may be administered.

Severity ratings are based on the following 10 point scale (0-9):

- 0-1 No real problem, treatment not indicated
- 2-3 Slight problems, treatment probably not necessary
- 4-5 Moderate problem, some treatment indicated
- 6-7 Considerable problems, treatment necessary

8-9 Extreme problems, treatment absolutely necessary

The severity ratings scale allows for the interviewer to determine the seriousness of a client's problem. The higher the score is, the greater the need for treatment in each area or immediate intervention. The ASI scores can be used to profile a client's problem areas and then plan an effective course of treatment (13).

Data analyzes were done using the SPSS-21 software. Results were compared using the Chi-square or Fisher's Exact test in categorical variables and one-way analysis of variance (ANOVA) in continuous variables. Logistic regression model for positive urine of MA was done with all variables that were found to be significant ($p < 0.05$) in the univariate analyses.

Results

Prevalence of MA

The percentage of MA use before and after treatment is as presented below.

Table 1. Prevalence of used drugs before treatment

Drug	Frequency	Percent
Narcotic	140	68.6
Methamphetamine	63	30.9
Others (alcohol, THC, etc)	2	0.5
Total	206	100

Table 2. The percentage of MA positive and negative urine tests

Drug	Frequency	Percent
MA positive test	70	34.3
MA negative test	115	56.4
missing	21	9.3
Total	206	100

A total of 70 (34.3%) of the 206 study participants were tested positive for MA in Tehran, which was 30.9 before starting treatment.

MA abusers and non-abusers

Patients with urine tests positive or negative for MA did not differ in age (38 years vs. 49, years, respectively, $P = 0.06$), duration of MMT (37 months vs. 23 months, $P = 0.79$), previously being treated for addiction ($P = 0.17$), job ($P = 0.19$), and education ($P = 0.08$). However, two groups revealed some significant differences in the rate of urine samples that tested positive for opiates ($P = 0.00$), using counseling facilities ($P = 0.00$), and marital status ($P = 0.01$).

Multivariate analyses

A logistic regression (multivariate analyses) demonstrated that the MA abusers were more likely to be opiate abusers ($OR = 4.9$, 95% CI 2.4–10.1) and less likely to be married ($OR = 0.85$, 95% CI 0.75–0.97).

Conclusion

Opioids have been used by Iranians for centuries but methamphetamine (MA) is a newly introduced psycho-stimulant drug in Iran, which is characterized by highly addictive effects. MA which is informally named *Shisheh* has been changed in to an epidemic drug of choice among MMPTs. There is a dearth of research on MA use and dependence in Iran (14). Methamphetamine is known as a synthetic derivative of amphetamine, but due to the addition of a methyl group in its chemical structure, it has lipid solubility, allowing more rapid transport of the drug across the blood-brain barrier (15). The most frequent and usual symptoms among Iranian MA users were delusions, mood instability, disorientation, and self-mutilation (16), also prevalent psychotic symptoms were persecutory delusions (82%), auditory hallucinations (70%), reference delusions (57%), visual hallucinations (44%), grandiosity delusions (39%) and jealousy delusions (26%) (17). Because of heavy use, many of such cases are characterized by delusions, hallucinations, anxiety, insomnia, mood disturbances, suicide, violent behaviors and homicidal ideations (18). This is consistent with some studies in other countries which indicate that heavy use of methamphetamine contributes to a variety of severe psychiatric problems (19).

Continued drug abuse during MMT represents a complication and, perhaps, a partial failure of MMT. As such, it be worthy of more attention. We studied the additional abuse methamphetamine – the most frequently abused drug in our population of Opioids individuals - having assessed the 206 study patients over a 5-year period. All our study patients were Opioids dependent and started their MMT as Opioids users during the 5-year period from 2009 to 2014. The high rate (34.3%) of MA abuse found among our patients. In the Andishe-No center, the abuse of MA was also found in the multivariate analyses to characterize narcotic abusers with fewer tare of marriage.

The primary clinical syndrome of MA overdose involves prominent neurological and cardiovascular effects, while secondary complications can involve renal, muscle, pulmonary, and gastrointestinal effects. In overdose, the patient may present with mydriasis, tremor, agitation, hyperreflexia, combative behavior, confusion, hallucinations, delirium, anxiety, paranoia, movement disorders, and seizures (20). It could be possible that MA may also be used for “management” (by the patients themselves) of opiate-induced- and sedative-induced sedation, meaning that MA use might also serve as a means to reduce drowsiness resulting from narcotics (including methadone) (10). This is consistent with the finding that the MA group, as compared to no MA users group was more likely to use narcotics as well.

A future study evaluating the motives, circumstances and patterns of MA intake by patients will add insight into the phenomenon. Such a study however, would necessitate informing patients and would require high sensitivity and specificity methodology for the detection of MA.

Clinical observations show an increase in methamphetamine use among stimulant-naïve successful MMT clients. Methamphetamine could be an attractive drug to ameliorate some of the side-effects of methadone on psychological energy, sexual functioning and cognitive performance. Not providing effective adjuvant psychological and behavioral interventions to address methamphetamine use (as is the current situation in Iranian MMT clinics) may undermine the benefits of MMT (9).

Globally, no pharmacological treatment has been approved for the treatment of MA use. Medications such as antidepressants, dopamine agonists and antagonists have been tried for their clinical effectiveness in managing MA withdrawal or dependence (21). In Iran, psychiatric medications are prescribed to manage acute and severe MA use presentations such as MA intoxication and psychosis. Several medications such as Bupropion (22), Baclofen (23), Topiramate (24), and Naltrexone (25) have been suggested for the treatment of MA use and dependence but non-pharmacological treatments have remained as the best practice. Non-pharmacological treatment interventions for MA use include brief interventions, behavioral therapies, psychosocial

therapies, residential rehabilitation, and 12-step programs.

Psychosocial therapies generally manipulate elements of education and the social environment to help patients recover from MA use and dependence. These therapies include cognitive behavioral therapy (CBT) (including the Matrix model of intensive outpatient treatment) and motivational interviewing (MI). The Matrix model includes elements of social learning, psychological education, and social support with CBT principles (26). In the largest trial of a treatment for MA-dependent clients in America, patients randomly assigned to receive the Matrix model treatment demonstrated better ability for retention in treatment, in producing more free urine samples and in achieving extended periods of abstinence compared with patients assigned to receive “treatment as usual” (27). The Matrix model is the most common outpatient treatment for MA use and dependence in Iran. It has received clinical attention and is implemented by psychotherapists and clinical psychologists at outpatient drug use treatment clinics in some large cities of Iran including Tehran. It should be noted that the national protocol of MA use treatment is being devised based on the Matrix model in Iran. A considerable number of Iranian MA-dependent patients receive the Matrix model but the clinical effectiveness of the Matrix model as an American model of MA use treatment has not been fully evaluated for Iranian MA-using population. MI is another form of psychosocial treatment. One important concept of MI is that the treatment is designed for patients to progress along the stages of change, assuming sole responsibility for their decisions about drug use (28). MI is one of the best implemented treatment interventions in Iran which contributes to increasing MA patients’ motivations to change and treatment adherence. MI is applied at outpatient addiction centers and it is an important part of long-term outpatient treatment of MA-dependent patients in the country. A considerable number of Iranian MA-dependent patients receive MI before initiating treatment with the Matrix model but there is a paucity of research on MI and its clinical effectiveness in Iran.

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Conflict of interest

There are no financial or other relationships that might lead to a conflict of interest.

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References

- Mokri A, Ekhtiari H, Edalati H. Substance abuse disorders and addiction. Iranian Textbook of Psychiatry for Medical Student Tehran: Tehran University of Medical Sciences. 2009.
- UNODC. World drug report. United Nations Publication, Sales No. E. 10. XI. 13, New York, NY; 2010.
- Nemati Mogadam M. Managing addiction as a chronic condition. *J Add*. 2008;4:64-7.
- Bovasso G, Cacciola J. The long-term outcomes of drug use by methadone maintenance patients. *The journal of behavioral health services & research*. 2003;30(3):290-303.
- Williamson A, Darke S, Ross J, Teesson M. The effect of persistence of cocaine use on 12-month outcomes for the treatment of heroin dependence. *Drug and Alcohol Dependence*. 2006;81(3):293-300.
- UNODC. World Drug Report 2014 By United Nations Office on Drugs and Crime New York: United Nations. 2014.
- Mokri A, Schottenfeld R. Drug abuse and HIV transmission in Iran—Responding to the public health challenges. *Public health aspects of HIV/AIDS in low and middle income countries*: Springer; 2009. p. 583-99.
- UNODC. World Drug Report 2007 (United Nations Publication, Sales No. E.07.XI.5). 2007.
- Shariatirad S, Maarefvand M, Ekhtiari H. Emergence of a methamphetamine crisis in Iran. *Drug and alcohol review*. 2013;32(2):223-4.
- Shariatirad S, Maarefvand M, Ekhtiari H. Methamphetamine use and methadone maintenance treatment: an emerging problem in the drug addiction treatment network in Iran. *Int J Drug Policy*. 2013;24:e115-6.
- Trujillo KA, Smith ML, Guaderrama MM. Powerful behavioral interactions between methamphetamine and morphine. *Pharmacology Biochemistry and Behavior*. 2011;99(3):451-8.
- McLellan AT, Kushner H, Metzger D, Peters R, Smith I, Grissom G, et al. The fifth edition of the Addiction Severity Index. *Journal of substance abuse treatment*. 1992;9(3):199-213.
- Fureman B, Parikh G, Bragg A, McLellan A. Addiction severity index. A guide to training and supervising ASI interviews (5th ed) University of PA/Philadelphia VAMC, Center for Studies of Addiction. 1990.
- Alam-mehrjerdi Z, Mokri A, Dolan K. Methamphetamine use and treatment in Iran: a systematic review from the most populated Persian Gulf country. *Asian Journal of Psychiatry*. 2015.
- Barr AM, Panenka WJ, MacEwan GW, Thornton AE, Lang DJ, Honer WG, et al. The need for speed: an update on methamphetamine addiction. *Journal of Psychiatry and Neuroscience*. 2006;31(5):301.
- Saberi SM, Khodabandeh F, Kahani A, Marashi SM. Delusional Problems and Mood Instability in Acute Psychotic Patients Dependent to Methamphetamine named “Shishe” among Iranian Population. *J Addict Res Ther*. 2012;3(132):2.
- Fasihpour B, Molavi S, Shariat SV. Clinical features of inpatients with methamphetamine-induced psychosis. *Journal of Mental Health*. 2013;22(4):341-9.
- Zarghami M. Methamphetamine has changed the profile of patients utilizing psychiatric emergency services in Iran. *Iranian Journal of Psychiatry and Behavioral Sciences*. 2011;5(1):1-5.
- Batki SL, Harris DS. Quantitative drug levels in stimulant psychosis: relationship to symptom severity, catecholamines and hyperkinesia. *American Journal on Addictions*. 2004;13(5):461-70.
- Callaghan RC, Cunningham JK, Allebeck P, Arenovich T, Sajeev G, Remington G, et al. Methamphetamine use and schizophrenia: a population-based cohort study in California. *American Journal of Psychiatry*. 2012;169(4):389-96.
- Herman BH, Elkashef A, Vocci F. Medications for the treatment of cocaine addiction: Emerging candidates. *Drug Discovery Today: Therapeutic Strategies*. 2005;2(1):87-92.
- Newton TF, Roache JD, De La Garza R, Fong T, Wallace CL, Li S-H, et al. Bupropion reduces methamphetamine -induced subjective effects and cue-induced craving. *Neuropsychopharmacology*. 2006; 31(7): 1537-44.
- Heinzerling KG, Shoptaw S, Peck JA, Yang X, Liu J, Roll J, et al. Randomized, placebo-controlled trial of baclofen and gabapentin for the treatment of methamphetamine dependence. *Drug and alcohol dependence*. 2006;85(3):177-84.
- Johnson BA, Roache JD, Ait-Daoud N, Wells LT, Wallace CL, Dawes MA, et al. Effects of acute topiramate dosing on methamphetamine-induced subjective mood. *The International Journal of Neuropsychopharmacology*. 2007;10(01):85-98.
- Jayaram-Lindström N, Wennberg P, Hurd YL, Franck J. Effects of naltrexone on the subjective response to amphetamine in healthy volunteers. *Journal of clinical psychopharmacology*. 2004;24(6):665-9.
- Rawson R, Obert J, McCann M. The Matrix intensive outpatient program therapist manual. Los Angeles, California: The Matrix Center, Inc. 1995.
- Rawson RA, Marinelli-Casey P, Anglin MD, Dickow A, Frazier Y, Gallagher C, et al. A multi-site

comparison of psychosocial approaches for the treatment of methamphetamine dependence. *Addiction*. 2004;99(6):708-17.

28. Bux Jr DA, Irwin TW. Combining motivational interviewing and cognitive-behavioral skills training for the treatment of crystal methamphetamine abuse/dependence. *Journal of Gay & Lesbian Psychotherapy*. 2006;10(3-4):143-52.