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**METHAMPHETAMIN INDUCED PSYCHOTIC DISORDERS IN THE PSYCHOTIC  
EMERGENCY DEPARTMENT**

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**ABSTRACT**

Methamphetamine induced Psychiatric disorders in the psychiatric emergency department. The aim of this one-year study was to determine the prevalence and some clinical and socio-demographic disorders caused by methamphetamine abuse found in emergency department (ED)-admitted patients at the psychiatric emergency department at Shafa Hospital, Rasht, Iran. All ED-admitted patients at the psychiatric at Shafa Hospital were examined by rapid and confirmatory methamphetamine-abuse tests following the report they made about the kind of drug they used, their history of psychiatric disorders reported by the patients themselves or their family, the patients past and recent drug abuse and the present psychiatric symptoms. The final diagnosis was obtained according to clinical indicators of DSM-IV-TR for psychiatric disorders induced by methamphetamine abuse. Out of the 2602 participants in the study, 1173 people (45%) had been using methamphetamine in the past one year. 179 persons (6.9%) were diagnosed with psychiatric disorders induced by methamphetamine abuse. In 42 percent of the cases, there were signs of methamphetamine abuse in the past one

year. The mean age of the male patients was 34 +/- 7.5, 91.6 percent of the patients were male, 57.5 percent of the patients were single, 66.5 percent did not have a university degree, 81.6 percent were unemployed and 18.4 percent had a prison record. In 89.4 percent had positive urine test, there was a 96.6 percent of the family's report of drug abuse, and in 65.9 percent there was a denial of drug abuse. The most frequent disorders induced by methamphetamine abuse included psychotic disorders (91.6%), intoxication (5%), and mood disorders (3.4%). A significant association was discovered between a diagnosis with disorders induced by methamphetamine abuse, and prison record, ( $P=0.0001$ ). The findings of this study showed that methamphetamines, a factor inducing psychiatric disorders, also comorbid with other psychiatric disorders and disorders related to the substance in the emergency departments. In addition to the importance of this drug as an inductor for psychiatric disorders in the Iranian society, its undesirable effects in worsening the rates and the precautions account for other comorbid psychiatric disorders. With the psychiatric symptoms that are not differentiable from other psychiatric disorders producing stable psychiatric disorder, there is a possibility that, with the present diagnostic criteria, the actual effects of this drug in inducing psychiatric disorders may be underestimated.

**Keywords: Psychiatric disorders, methamphetamine, and psychiatric emergency department**

## INTRODUCTION

Abuse of illicit drugs and dependency on them is a major problem in all societies which entails various social, psychiatric and personality problems [1, 2]. Along with social health, psychiatric, familial, and economic problems, drug abuse will severely affect the addicted person with a serious decline in his/her individual and social reactions [3]. Although traditional narcotics and synthetic illicit drugs threaten all countries, our country, regarding its specific geographical conditions and bordering the biggest narcotic-producing country in the world, Afghanistan, will face

even more problems [4]. According to experts, the main reasons for this widespread use of illicit drugs in our country will be the young population, the spread of satellite towns and the easy access to synthetic drugs in our country [5]. Methamphetamines are among the most common synthetic drugs used. The consumption of methamphetamines had a 70 percent increase between 1999 and 2000, and now is used more than heroin and cocaine [6]. Crystallized methamphetamine, called "shishah" in Iran, is one of the most famous inductors which has become most

popular especially among young people in Iran and other countries [7]. Methamphetamine is an inductor and an addictive drug which mainly comprises amphetamine C9 H13 N. Stimulating the dopaminergic system, this substance will cause physiological responses such as an increase in hypodermic blood flow, changes in the rate of heartbeats, blood pressure, and neurobiological responses recorded by brain scanning systems such as the FMRI, as well as excited behaviors resulting in a state known as *rush*, or *flush* [7]. In the latest formal statistical figures regarding addiction in Iran which was conducted in a rapid, large-scale evaluation of addiction across Iran, addiction to methamphetamine was found to be at 5.2 percent of the whole population of addicted people [8]. These statistics show that the pattern of abuse of synthetic drugs such as *crack*, *heroin* and Methamphetamine, in Iran in the past years has undergone significant changes [9]. Methamphetamines account for susceptibility to infection, especially HIV, loss of weight, and dental problems, affecting vital organs such as the heart and the brain [10]. Studies have examined the existence of psychiatric diseases in those addicted methamphetamines, and have reported the existence of mood disorders, psychotic disorders, and stress-related disorders [11, 12]. Methamphetamines can

be associated with psychiatric disorders such as disorders in thinking, memory problems, aggressiveness and violence. The side-effects of methamphetamine abuse on cognitive abilities are evident and they include adverse effects on learning, recalling, deduction, information modification, and ignoring irrelevant information. Some of these disorders will persist even for a short time after quitting. In addition to physiological side-effects of these drugs, recent studies have focused on a number of mental problems related to methamphetamine. It seems that people addicted to this drug suffer more mental and psychiatric disorders compared to those addicted to other types of narcotics, and lose control more readily [13]. Chronic abuse of methamphetamine can also result in such mental behavior as extreme pessimism, confusion, visual and aural illusions, and aggressive behavior. Psychotic symptoms can persist for even months or years after the use of such drugs [10].

Numerous studies have been conducted on drug abuse and consequent psychiatric disorders in patients in emergency departments at hospitals all over the world [14]. In the study conducted by Saberi and colleagues in 2010, in Tehran, Iran, Methamphetamine was determined to be the most important cause of delirious jealousy, absence of attention to time and place, and

self-injury [10]. In the study by Salo (*et al*, 2011), addicted people suffered the following disorders: 28.6 percent initial psychotic disorders, 23.8 % drug dependence, 13.2 % delirious disorders induced by methamphetamine, 10.6 percent mood disorders related to methamphetamine, and 3.7 percent stress-related disorders induced by methamphetamine abuse [13].

With regards to the increase in the abuse of synthetic inductors such as Methamphetamine in our country, and reports from psychiatric hospitals regarding an increase in the disorders related to Methamphetamine observed in psychiatric wards, the recent study has aimed to examine the prevalence of abuse of this drug and the clinical specifications, and socio-demographic disorders caused by Methamphetamine observed in the psychiatric department at Shafa Hospital in Rasht, Iran, which is the only psychiatric department covering Guilan Province, with a population of 3.5 million, and parts of neighboring provinces.

## METHODOLOGY

This study was conducted at the psychiatric department at Shafa Hospital in Rasht, between August 2012 and 2013. as a cross-sectional study. Sampling was easy and available and all ED-admitted patients at the psychiatric emergency department of the

hospital were examined for the study. After the preliminary check-in procedures, the patients are examined by the department assistants for physical check-up, psychiatric and the routine tests, and detecting drugs. After the initial examination, instructions will be given to the heads of department. And patients who are checked in at the psychiatric department will be referred to the respective departments in the hospital. In this way, it will be possible to monitor and examine all these inpatients. Assistants and the psychologist in charge of this study (mentioned in the paper) examined the history of the patients in a period of between 8 and 24 hours after the check-in time, and maintained their examination until the final diagnosis. Study findings were categorized in two main groups: demographic information about the patients, and clinical specifications including the psychiatric record of the patients, drug abuse, present psychiatric symptoms, and the self-report by the patients, and the report from the family of the patients about the drug abuse and results from diagnostic laboratory tests of drug and methamphetamine, all of which are recorded in the research profile. At the end, those diagnosed with psychiatric disorders related to methamphetamine abuse were examined psychologically too. The final diagnosis was determined when diagnostic criteria of psychiatric disorders

induced by methamphetamine abuse based on diagnostic factors of DSM-IV-TR were found to exist. Since the diagnostic procedures and examinations are part of diagnostic and treatment programs, and professional protection of patients' private information, it is believed that such principles have been observed.

Collected data were processed by SPSS: quantitative data were examined for mean values and standard deviation, and qualitative data were examined in terms of prevalence. The chi-square test was used for the statistical analysis and values less than 0.05 were considered as meaningful.

## RESULTS

Out of the 2602 participants in the study, 1173 people (42%) had been using methamphetamine in the past one year, 179 (6.9%) of whom were diagnosed with psychotic disorders induced by methamphetamine abuse based on DSM-IV-TR criteria. 51 people (28.5%) methamphetamine abuse, 119 people (66.5%) methamphetamine dependence, 9 people (5%) intoxication of methamphetamine were diagnosed. Out of the remaining 994 people (38.2%). Although they had a history of methamphetamine abuse, based on the psychiatric criteria, initial psychiatric disorders were associated with methamphetamine abuse, or diagnosed

psychiatric disorders were not linked only with methamphetamine abuse, but with abuse of other drugs (**Diagram 1**). The mean age of those diagnosed with psychiatric disorders linked with methamphetamine abuse was  $34 \pm 7.5$ , out of whom 91.6% were men, 66.5% without a high school diploma, 81.6% unemployed, and 18.4% had a prison record. There was a meaningful association between psychiatric disorders caused by methamphetamine abuse and prison record. ( $P=0.0001$ ) But there was not a statistically meaningful association between these psychiatric disorders and age, gender, marital status, education, and jobs (**Table 1**).

164 patients (91.6%) were diagnosed with psychotic disorders, 9 (5%) with intoxication, and 6 (3.4%) with mood disorders caused by methamphetamine abuse (**Table 2**). There was not a meaningful association between research variables and psychiatric disorders induced by methamphetamine abuse. 160 patients (89.4%) had positive urine tests, 173 (96.6%) had positive reports from the family as to methamphetamine abuse, and 118 patients (65.9%) denied any drug abuse (**Table 3**).

## DISCUSSION AND CONCLUSION

This study aimed at analyzing psychiatric disorders related to methamphetamine abuse in patients admitted to the psychiatric

department at Shafa Hospital in a one-year period. Previous studies had shown that in endemic regions one to two percent of admissions at emergency departments and 8 percent of admissions at psychiatric departments relate to methamphetamine abuse. Methamphetamine abuse has recently had a rapid growth, turning into a major challenge for health analysis [16]. Unofficial estimates have determined methamphetamine to be the 2nd most widely used illicit synthetic drug in Iran, and that psychiatric disorders pertaining to the abuse of methamphetamine are on the rise [17]. The relative mean age of patients admitted to the psychiatric department and the consequent psychiatric disorders are similar to previous studies. Most of the patients were male, young, single and without a high school diploma, which corresponds to previous studies [18-21]. The implication is that educational and preventive programs must focus more on such people.

Efforts have been made in this study to perform more accurate diagnostic tests to determine prevalence of methamphetamine-related psychiatric disorders in patients admitted to psychiatric departments, and to use a range of laboratory tests, family's reports, and clinical symptoms to reach a more accurate estimation. The diagram shows that 6.9 percent of those who were

admitted to the department suffered methamphetamine-related psychiatric disorders (**Diagram 1**). This means that the diagnosed psychiatric disorders were directly related to methamphetamine abuse based on DSM-IV-TR diagnostic criteria, and not related to any other diagnosis pertaining to I or any other drug. Various studies found no differentiable link between methamphetamine-related psychotic disorders and other psychotic disorders such as schizophrenia [22]. Therefore, in the process of diagnosis, reports from the family, drug-detection tests, and signs of poisoning in the check-in file of the patient, with a view to exclude any effect from other drug will be of crucial importance. Participants in this study were those without any history of psychiatric disorders and present symptoms could not be related to any drug or diagnosis. Another considerable finding from this study is that 38.2 percent of those admitted to the psychiatric department who were not diagnosed with psychiatric disorders pertaining to methamphetamine abuse had in fact a history for *methamphetamine* abuse. This can show that regarding the final diagnosis made about those who were checked in methamphetamine abuse was determined to exist with other patients suffering psychiatric disorders such as psychotic disorders, mood disorders, personality

disorders, etc, which can naturally affect the rate of and precaution for these disorders and can lead to worse consequences in the case of any of the disorders coinciding [18]. Among those patients admitted to our department, who suffered psychiatric disorders caused by methamphetamine abuse, the patient's report of his/her drug abuse did not correlate much with the final diagnosis from the report, urine tests, and reports from the family. Patients admitted to the department might deny any drug use, despite the undeniable clinical evidence, the patient's profile and reports from the family confirming drug abuse. This finding is hard to explain. It is possible that legal concerns and worries about assuming responsibility for drug abuse are the cause. But this hypothesis may not be firmly supported given that a patient suffering psychotic disorders may not feel inhibited to express concerns or admit to having abused other drugs. It is also possible that the patient is affected by the illness, and that neurotoxic drugs can affect those areas vital to judgment and cognition [23].

Clinically speaking, it is important to note that the report from the family about the behavioral characteristics and evidence relating to drug abuse and consequent intoxication are a more determining indicator than the self-report by the patient and drug-detection tests. Necessary drug-

detection tests only detect a certain density of the drug within a limited time of use (about 3 days). However, psychiatric disorders induced by drug abuse can persist even after quitting the drug and when the symptoms are gone [24]. Methamphetamine-abuse is correlated with anti-social behaviors and criminal acts. Many of those addicted to methamphetamine end up in prison because of their criminal behaviors [25]. Our study showed a statistically meaningful correlation between prison record and a diagnosis of methamphetamine-induced psychiatric disorders. This means that those diagnosed with methamphetamine-induced psychiatric disorders were less likely to have had a prison record. The discrepancy might be explained regarding the fact that our group of the 6.9 percent of the participants in question had no history of multiple-drug addiction, or any previous record of psychiatric disorders, while the case was different for the other group of participants who had a previous history of psychiatric disorders as well as a history of other drugs along with methamphetamine, which might explain the discrepancy in the result. Apart from a specific group of participants who were chosen for this study, a large number of participants who had been hospitalized had a history of multiple-drug addiction, including methamphetamine,

cannabis, and alcohol. The most common pattern of abuse among Iranians is multiple-drug addiction, all of which are able to cause psychiatric disorders. In Iran, the common pattern of drug abuse is the use of methamphetamine along with another narcotic in order to induce more pleasure and hide such symptoms as insomnia [26]. In an atmosphere where there is a tendency for multiple-drug addiction, and the disturbed life of the patient, which can be worsened if they suffer from psychosis too, and when data collection can become more difficult, it will not be very accurate to term a drug *psychosis*. There is usually no exactly known interval between the time of drug abuse and when the symptoms begin to appear. There are some who have a history of methamphetamine abuse and the related psychosis can demonstrate psychotic symptoms even when not using the drug [27]. The symptoms are not case-specific, and both positive and negative symptoms can be seen in the case of permanent damage due to prolonged drug abuse, and because of neurotoxic effects on the frontal and striatal areas, even if there has not been a prolonged use of the drug or over one month [23]. The authors of DSM are still skeptical about the diagnosis for permanent psychosis induced by methamphetamine abuse which is strongly believed by oriental and Japanese researchers, and what

Japanese authors diagnose as permanent psychosis induced by methamphetamine abuse is believed, by others, to be a type of schizophrenia [28]. Symptoms of manic phase pertaining to bipolar disorder can easily be mistaken for acute phase of poisoning pertaining to methamphetamine abuse. In addition to this examination, a substance that can cause chronic psychosis is able to enable a schizophrenia-like debilitating process [29]. Defining methamphetamine as a trigger point for a process which is to eventually be diagnosed as schizophrenia will cause even more doubt, which will make it difficult to make a correct diagnosis of schizophrenia.

55.4 percent (n=651) of those who had had methamphetamine -abuse in the past year were diagnosed with multiple-drug abuse too. 29.2 percent (n=343) were diagnosed with other psychiatric disorders. Regarding the former group, one cannot find a definite relationship between psychiatric disorders and a drug, although one cannot rule out any of the drugs' effects. As for the latter, it is possible that those who were diagnosed with methamphetamine -induced schizophrenia actually suffered permanent psychosis caused by a certain methamphetamine dose. At a glance, it can be said that although only 6.9 percent of those visiting emergency departments were diagnosed with methamphetamine-induced psychiatric



disorders, the rate of 45 percent of patients admitted to the emergency departments (suffering from either drug abuse in the past one year, or a known psychiatric disorder, or multiple-drug abuse at the time of check-in) shows the magnitude of this hazard, and its disastrous effect on each and every related problem including initial psychiatric disorders or multiple-drug abuse.

The scope of our study was limited to the participants from the population of impatiens, and not all in the society. As our study was focused on emergency patient, some non emergent disorders, like methamphetamine related sleep disorders and methamphetamine related sexual disorders were not actually diagnosed.

**Table 1: an analysis of demographic specifications of ED-admitted patients at Shafa Hospital, who were diagnosed with methamphetamine-induced psychiatric disorders**

	variable	number	percentage
age	Less than 30	62	34.6
	30 to 40	79	44.1
	More than 41	38	21.2
gender	female	15	8.4
	male	164	91.6
Marital status	single	103	57.5
	married	57	31.8
	divorced	19	10.6
education	illiterate	12	6.7
	primary	22	12.3
	Without a high school diploma	119	66.5
	High school diploma and associate degree	25	14
profession	University degree	1	0.6
	clerk	5	2.8
	jobless	164	81.6
	Small business	16	8.9
Prison record before or at present	worker	12	6.7
	yes	33	18.4
	no	146	81.6

**Table 2: prevalence of all types of methamphetamine-related side-effects in ED-admitted patients at Shafa Hospital**

Side-effects	number	percent
Mood disorders	6	3.4
Psychotic disorders	164	91.6
intoxication	9	5
total	179	100

**Table 3: prevalence of methamphetamine-induced psychiatric disorders in ED-admitted patients at Shafa Hospital**

Type of verification	Status of verification	number	percentage
Urine test	yes	160	89.4
	no	19	10.6
total		179	100
Family of patients	yes	173	96.6
	no	6	3.4
total		179	100
patient	yes	61	34.1
	no	118	65.9
total		179	100

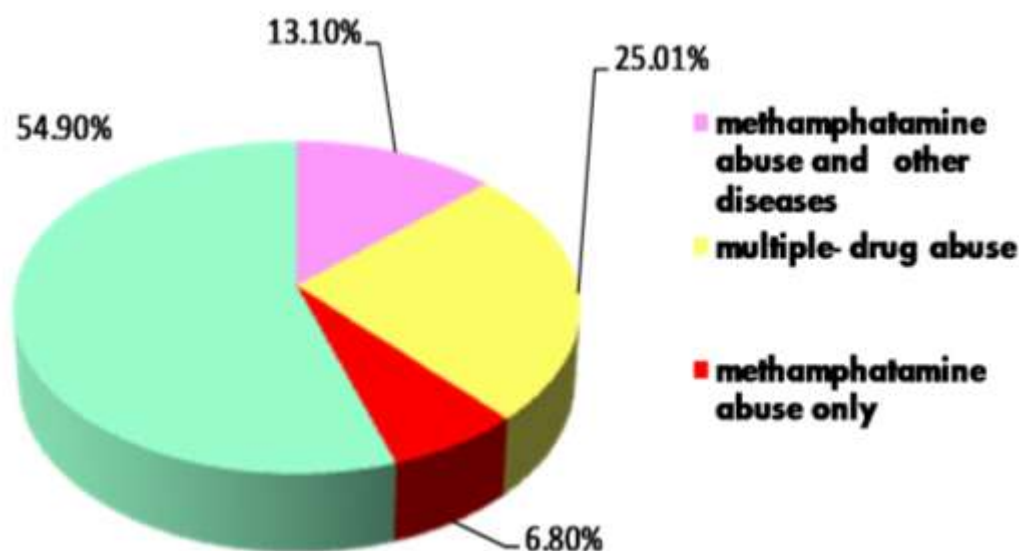


Diagram 1: frequency distribution of ED-admitted patients at Shafa Hospital between August 2012 and August 2013

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