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Psychiatric comorbidity in methamphetamine dependence

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Abstract

The primary aim of the present study was to assess the prevalence of psychiatric comorbidity in a large sample of methamphetamine (MA) dependent subjects using a validated structured clinical interview, without limitation to sexual orientation or participation in a treatment program. The secondary aim was to assess whether the prevalence of psychiatric co-morbidities varied by gender. Structured Clinical Interviews (SCIDs) were administered to 189 MA-dependent subjects and lifetime prevalence of DSM-IV diagnoses was assessed. Across the sample, 28.6% had primary psychotic disorders, 23.8% of which were substance-induced; 13.2% had MA-induced delusional disorders and 11.1% had MA-induced hallucinations. A substantial number of lifetime mood disorders were identified that were not substance induced (32.3%), whereas 14.8% had mood disorders induced by substances, and 10.6% had mood disorders induced by amphetamines. Of all participants, 26.5% had anxiety disorders and 3.7% had a substance-induced anxiety disorder, all of which were induced by MA. Male subjects reported a higher percentage of MA-induced delusions compared to female abusers. Given the impact of MA psychosis and other drug-induced symptoms on hospitals and mental health services, the description and characterization of co-morbid psychiatric symptoms associated with MA use is of paramount importance.

Keywords

substance abuse; stimulants; psychiatric comorbidity; gender

1. Introduction

Unlike the use of cocaine, cannabis and opiates, the global problem caused by amphetamine-type stimulants appears to be growing as current data reveal that between 16 and 51 million people world-wide used such drugs illegally in 2007 (UNODC, 2009). Adding to the international statistics are reports that admissions to publically-funded substance abuse treatment programs with methamphetamine (MA) as the primary substance increased 255% from 1997 to 2007 in the United States (SAMHSA, 2006; SAMHSA, 2008). In addition to the impairment directly associated with the disorders of MA Dependence or Abuse,

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psychiatric symptoms associated with MA use can cause considerable morbidity. Published studies have reported that significant numbers of MA-dependent individuals experience symptoms severe enough to require psychiatric hospital admission, and many have attempted suicide in their lifetime (Zweben et al., 2004; Glasner-Edwards et al., 2008). Although much work has been done describing psychiatric comorbidity in cocaine-using persons (Schottenfeld et al., 1993; Ziedonis et al., 1994) and in the general drug-using population (Warner et al., 1995), less work has been carried out in MA-dependent samples (Glasner-Edwards et al., 2009, Glasner-Edwards et al., 2008, Shoptaw et al., 2003). When co-occurring psychiatric disorders are present, they may adversely affect the response to treatment of substance use disorders (see Ries and Goldsmith, 2009 for a review). Published studies have shown that patients who had access to ongoing mental health treatment had better substance abuse outcomes compared to those who did not (Moos et al., 2002, Ouimette et al., 1998). Thus, the characterization and description of co-occurring disorders is an important first step in the treatment of co-occurring psychiatric disorders in MA abuse. Knowledge about the frequency and characteristics of co-occurring disorders may lead to improved diagnostic efficiency and accuracy. Such information may also guide clinical and programmatic planning for additional mental health services that may be required in the treatment of MA dependence.

1.1. Depressive Disorders

Research to date has shown that depressive disorders and symptoms are frequently associated with MA use. The National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) utilized the Alcohol Use Disorder and Associated Disabilities Interview Schedule-DSM-IV Version (AUDADIS-IV) to assess psychiatric diagnoses in a probability sample of 43,093 subjects (Stinson et al., 2005; Conway et al., 2006). The lifetime prevalence of mood disorder among participants with amphetamine dependence was 64%.¹ The studies did not report on participants diagnosed with substance-induced disorders (Stinson et al., 2005; Conway et al., 2006). Lifetime prevalence of psychiatric diagnoses was assessed using the Structured Clinical Interview for DSM-IV Disorders (SCID) in 155 gay or bisexual men seeking treatment for MA abuse or dependence (Shoptaw et al., 2003). Mood disorders were found in 52% of the sample; of which 41% of subjects met criteria for substance-induced mood disorders.

In a comparison of 46 MA users with 31 non-users, trends were observed for more symptoms of depression in the MA users as measured by the Center for Epidemiologic Study-Depression questionnaire (CES-D; Nakama et al., 2008). Another published study of 1,580 arrestees found that those with MA-dependence were significantly more likely than other arrestees to report histories of depressive symptoms and suicidal ideation (Kalechstein et al., 2000). These results held up even after controlling for demographic variables and abuse of other drugs. In a study of a mixed population of 55 MA users from a court-referred drug treatment program and 51 MA users who had minimal contact with criminal justice institutions 37% reported experiencing depressive symptoms (Sommers et al., 2006).

The relationship between drug use patterns and depression was examined in a study of 146 heterosexual female MA users in which 60% of the sample met Beck Depression Inventory criteria for moderate to severe symptoms of depression (Semple et al., 2007). Those with more severe depression were more likely to be binge MA users, use more MA per month, and use MA more times per day on a greater number of consecutive days, than those with milder or no symptoms of depression. Several studies have examined the clinical course and

¹In this study and others reviewed below, the terms amphetamine and MA were used synonymously; illicit use and treatment admissions are much more common in the United States for MA than for other amphetamines.

treatment outcome of MA users with depression (Zweben et al., 2004; Glasner-Edwards et al., 2009; Sutcliffe et al., 2009). In a follow-up study of 526 MA-dependent adults who had taken part in the Methamphetamine Treatment Project (MTP), Glasner-Edwards et al. reported that 15% met criteria for major depressive disorder (MDD) at 3-year follow-up. A significantly greater proportion of those reporting past-month MA use (26%) had MDD relative to those MA-abstinent (11%), and those with MDD had used MA more frequently during the follow-up period than those without MDD. The effects of behavioral treatment on depressive symptoms were also studied in a group of 863 MA users (73% male) in Thailand. In this study 35% of the sample reported high levels of depressive symptoms at baseline as measured by the CES-D (Sutcliffe et al., 2009). Follow-up analysis revealed that those subjects who stopped MA use during this trial and maintained sobriety had significantly fewer depressive symptoms than those who continued MA use. These studies suggest that increased MA use may contribute to the exacerbation of affective symptoms and, in contrast, maintaining drug abstinence may reduce the severity of the depressive episodes or symptoms.

1.2. Psychotic Disorders

A subset of individuals who chronically abuse MA develops severe recurrent psychotic symptoms, commonly termed MA psychosis. These symptoms are often associated with high levels of psychiatric hospitalization and serious social dysfunction (Leamon et al., 2002; Chen et al., 2003). Several studies have examined the prevalence of MA psychosis and one study reported a lifetime prevalence of 27% for psychotic disorder diagnoses (all substance-induced) based on the SCID (Shoptaw et al., 2003). Another study of Australian MA users reported that 23% of their sample had symptoms of psychosis in the previous year, as measured by the Brief Psychiatric Rating Scale (McKetin et al., 2006). When subjects who had a history of non-drug-induced psychotic disorder were excluded, the past year prevalence was 18%. In a another MTP follow-up study, Glasner-Edwards et al. reported that 12.7% of the sample met criteria for a lifetime psychotic disorder (Glasner-Edwards et al., 2010).

One study used the Psychotic Symptom Assessment Scale (PSAS) to examine psychosis in 43 MA and 42 cocaine dependent persons who had no DSM-IV axis I diagnoses other than nicotine, MA, or cocaine dependence (Mahoney et al., 2008). Substantial percentages of the MA-users reported symptoms of paranoia (64% of males and 67% of females) and 40% of males and 47% of females reported that they had experienced hallucinations such as “imagining someone called your name.” In Sommers' study of 106 MA abusers described earlier, 38% reported a lifetime history of hallucinations and 63% reported a history of paranoia (Sommers et al., 2006). Leamon et al. assessed MA-associated paranoia in 274 MA dependent subjects, of whom 45% experienced their first episode of paranoia while using MA (Leamon et al., 2010). Another recent study of 46 MA abusers also observed trends for more symptoms of psychosis in MA users than in non-users as measured by the Symptom Checklist-90 (Nakama et al., 2008).

In a large-scale Taiwanese study, 445 MA users from a psychiatric hospital and criminal detention were assessed to determine the relationship of pre-morbid personality traits, social function, and other psychiatric disorders to MA-induced psychosis (Chen et al., 2003). Thirty-nine percent met criteria for lifetime history of MA-induced psychosis. Early initiations of MA use, use of larger amounts of MA, and higher scores on measures of pre-morbid schizoid/schizotypal personality traits were all associated with increased risk of psychosis.

1.3. Anxiety Disorders

Limited information is available on the prevalence of anxiety disorders associated with MA use. In the Shoptaw study cited above, 25% of MA users reported a lifetime prevalence of substance-induced anxiety disorders (Shoptaw et al., 2003). One Australian study reported that 76% of 301 regular amphetamine users reported experiencing severe anxiety and 33% had panic attacks after initiation of MA use (48% reported severe anxiety and 11% had panic attacks before they began MA use; Hall et al., 1996). The NESARC (Conway et al., 2006) described earlier reported a lifetime prevalence for anxiety disorders of 50% among amphetamine users, but the percentage of substance-induced anxiety disorders was not reported.

1.4. Gender Differences

1.4.1. Depressive Disorders—Gender differences in psychopathology associated with MA use have also been reported, with most linked to MA-induced depression. Several studies have reported that significantly more MA-dependent women have made lifetime suicide attempts compared to male MA abusers (Brecht et al., 2004; Zweben et al., 2004; Glasner-Edwards et al., 2008) and one study of 200 inpatient adolescent MA abusers (125 males, 75 females), found a higher incidence of depression in females (7%) than in males (2%) (Yen and Chong, 2006). Consistent with the findings above depressive symptoms on the Beck Depression Inventory (BDI) were endorsed by 34% of females in the MTP compared to 24% of the males. Furthermore in this same sample of 1016 MA abusers, 68% of the females reported depression on the Addiction Severity Index (ASI) compared to 50% of males (Zweben et al., 2004). In a 3-year follow-up to the MTP study, a marginally significant relationship was found between gender and MDD diagnosis (based on the Mini-International Neuropsychiatric Interview), with 18% of women meeting criteria for MDD compared to 11% of men (Glasner-Edwards et al., 2009).

1.4.2. Psychosis—The findings on MA-induced psychosis suggest a lack of gender differences. In the study by Chen et al. previously described, 74% of the 174 subjects in a group with MA-induced psychosis were men (Chen et al., 2003). However, after controlling for study site differences the authors found no significant difference in gender ratios between groups of MA users with and without a lifetime history of MA-induced psychosis. Other studies have also failed to detect gender differences in MA-induced psychosis (Brecht et al., 2004; Lin et al., 2004).

1.5. Study Rationale

The primary aim of our study was to assess the prevalence of psychiatric comorbidity in a large sample of MA-dependent subjects using a validated structured clinical interview, without limitations on gender, sexual orientation, or participation in treatment. A secondary aim was determining whether the prevalence of psychiatric co-morbidities varied by gender.

2. Methods

2.1. Subjects

The subjects were 189 MA users enrolled in larger ongoing studies of MA use at two study sites: Sacramento and San Francisco, California. Participants were required to be 18-65 years of age, MA-dependent, but not meeting DSM-IV criteria for current dependence on any drug other than MA or nicotine. Research assistants approached persons who reported MA use at each of the San Francisco and Sacramento, California sites, and explained a written informed consent form that detailed study procedures, risks, and benefits. All

subjects completed the same consent process. Institutional Review Boards approved consent forms, subject compensation, and the study protocol.

2.2. Procedures

The Structured Clinical Interview for DSM-IV Disorders (SCID; First et al., 1995) was administered to all participants to assess whether the subjects met criteria for Axis I disorders. The SCID is designed to be given by trained interviewers and allows for rapid elimination of clearly irrelevant diagnoses. All SCID interviews were administered by masters or doctoral level researchers, and reviewed by the authors (RS, TEN, and MHL). Lifetime prevalence of DSM-IV diagnoses was assessed across the sample. Interviewers determined whether a disorder was primary or substance-induced using the algorithms within the SCID that correspond to established DSM-IV criteria. These criteria state that the essential feature of a drug-induced disorder is the onset of symptoms in the context of drug use, intoxication, or withdrawal. See Appendix I for DSM-IV criteria.

2.3. Statistical Analysis

We compared the total number of psychiatric diagnoses by sex using the Mann-Whitney U test, and compared the prevalence of diagnoses by sex with Fisher's exact test. In order to control for testing multiple hypotheses, we assessed the significance of Fisher's exact tests using the Benjamini and Hochberg approach (Benjamini and Hochberg, 1995). Broad disorder categories (substance use, substance-induced, psychotic, mood, anxiety, and other) were tested first, and then subcategories were tested if differences were found (see Table 2). Because of our interest in MA-induced paranoia (Leamon et al., 2010) we used Fisher's exact test to compare MA-induced psychotic disorder with delusions by gender.

3. Results

Of the 189 subjects, most were male (67%), Caucasian (70%), and heterosexual (66%). Participants tended to be either single and never married (38%) or separated/divorced (34%). The mean age of subjects was 37.6 years. No significant gender differences were observed across demographic or drug use variables. Demographic information is summarized in Table 1.

As Table 2 indicates, the most common lifetime comorbid conditions were other substance use disorders (n=153; 81%), followed by substance-induced disorders (n=66, 35%). Fifty-seven percent reported past dependence on other drugs, and 56% had abused other drugs. The most common past drug dependence diagnoses (prevalence of dependence on nicotine was not measured) were for alcohol (n=62, 33%), cocaine (n=51, 27%), and cannabis (n=28, 15%), whereas the most common abuse diagnoses were for cannabis (n=46, 24%) and alcohol (n=32, 17%).

Mood and anxiety disorders were less often substance-induced than not substance-induced (15% v. 32% and 4% v. 24%, respectively). In contrast, psychotic disorders were more often substance-induced than not (24% v. 5%). Most substance-induced disorders were MA-induced. A history of hallucinations was reported by 15% of subjects, and of delusions by 16%. Of non-substance-induced disorders, 6% reported bipolar disorder, 7% generalized anxiety disorder, 2% schizophrenia, and 12% post-traumatic stress disorder.

Anxiety disorders were more common in women (22; 34.9%) than men (24; 18.8%), but this difference was not significant after Benjamini and Hochberg adjustment for multiple comparisons. There was a significant difference between men and women in the prevalence of MA-induced delusional disorder (24 [19.0%] versus one [1.5%]; $p=0.0004$, two-tailed

Fisher's exact test). No other gender differences among MA-induced disorders reached statistical significance.

4. Discussion

This study extends the findings from other studies that have differentiated between non-substance and substance-induced disorders (Shoptaw et al., 2003; McKetin et al., 2006) and seeks to investigate psychiatric co-morbidities in MA-dependent users without limitation to sexual orientation, criminal record, or somatic comorbidity. The results reported in this study suggest that the prevalence of psychiatric disorders associated with MA use is significant. Across the sample of 189 MA abusers, 23.8% had MA-induced psychotic disorders, 10.6% had mood disorders induced by amphetamines and 3.7% had MA-induced anxiety disorders. Many of the subjects also had primary Axis I disorders not related to substance use. Diagnoses of depression and anxiety were more often not substance-induced, whereas psychotic disorders were more often substance-induced. This finding of a high prevalence of substance-induced psychotic disorders is consistent with McKetin et al as well as the results reported by Shoptaw et al (Shoptaw et al., 2003). In contrast, diagnoses of independent depressive and anxiety disorders among MA abusers seem to be higher than substance induced ones, in both the Shoptaw et al study (Shoptaw et al., 2003) and the current study.

The data from this study combined with the other studies reviewed in this article suggest that psychiatric comorbidity is a major health concern when treating addiction to stimulant drugs such as MA. It may well be that standard drug treatment interventions need to take into consideration integrated treatment of both MA-induced and other Axis I disorders with symptoms such as psychosis, depression and anxiety when developing a treatment regimen. Many comorbid symptoms are exacerbated by ongoing MA use and, conversely, remaining abstinent reduces the severity of psychiatric symptoms (Zweben et al., 2004; Glasner-Edwards et al., 2009). The international studies reviewed within this paper suggest that comorbid psychiatric disorders are a global public concern.

4.1. Gender Differences

Gender differences in prevalence rates of depression have been widely reported across the studies reviewed (Brecht et al., 2004; Zweben et al., 2004; Yen and Chong, 2006; Glasner-Edwards et al., 2008; Mahoney et al., 2008). These data suggest a higher rate of depressive disorders in female MA abusers compared to males. In contrast, the evidence for gender differences in psychosis is less compelling. However, despite the differences in sampling methods across studies, our findings on gender differences are consistent with those reported by Chen et al. (Chen et al., 2003) in that a greater percentage of men met criteria for MA-induced psychosis compared to women. Our study extends those findings in that we report a selective gender difference in MA-induced delusions, but not MA-induced hallucinations.

4.2. Limitations

Although the sample is large, it was not recruited to be representative of a population, so our results may not be fully generalizable and may over-represent Caucasians males and non-heterosexual individuals. Furthermore, as the sample may not be representative of the general population, the interpretation of the gender results may not be generalizable. Although the participants are relatively young, there is always the inherent possibility of recall error when relying solely on self-report of past symptoms, both in terms of under and over-reporting, as well as misreporting relationships between drug use and the presence of psychiatric symptoms. The extent and direction of such errors is unknown.

4.3. Conclusion

The strengths of our study are: 1) a large sample; 2) a well-known and established structured clinical assessment; and 3) careful distinction between substance-induced and non-substance-induced psychiatric disorders. Our findings differ from other studies in the prevalence rate of mood and anxiety disorders diagnosed, although comparisons across studies are difficult due to: 1) differences in gender distribution; 2) exclusion of non-substance induced DSM-IV disorders; 3) reporting of point prevalence compared to lifetime prevalence; and 4) potentially other sampling factors (Stinson et al., 2005; Conway et al., 2006; Semple et al., 2007; Sutcliffe et al., 2009). In this study we were able to provide clinically relevant information on the prevalence of psychiatric disorders among MA-dependent users, provide additional data on the percentage of primary and substance-induced disorders and to identify novel information on gender differences in MA-induced delusional disorder.

The characterization of comorbid psychiatric disorders in a non-clinical sample of MA-dependent individuals has important relevance to clinical settings. As many MA abusers end up in hospital emergency rooms, knowledge about which Axis I disorders have a greater likelihood to be substance induced versus primary may contribute to more rapid diagnoses and initiation of additional psychiatric treatment, reducing the time spent in crisis or inpatient settings (Gray et al., 2007). It is well documented that MA-related crisis admissions have a major impact on emergency medical resources and those patients are at high risk for hospital readmission (Zweben et al., 2004; Gray et al., 2007). In conjunction with the other studies cited, our results indicate that a high level of clinical alertness for the presence or recurrence of independent mood and anxiety disorders is warranted in the MA-dependent population. Failure to do so may result in poorer treatment response, both for the MA dependence and for the co-occurring other psychiatric disorder. Similarly, the high percentage of lifetime but not current dependence on other substances suggests that addressing the potential for relapse with other substances should be a component of treatment for MA dependence. Furthermore, careful characterization of substance-induced vs primary may serve to inform and guide maintenance care and subsequent treatment. Further studies are needed to characterize subgroups of those with MA dependence who develop MA-induced psychiatric symptoms (e.g., investigation of genetic factors), and to elucidate the mechanisms of gender differences in response to MA exposure.

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Appendix I DSM-IV Criteria for Substance-induced Disorders

DSM-IV Diagnostic Criteria for Substance Induced Mood Disorders (Summary of Criteria)

- A. A prominent and persistent disturbance in mood predominates in the clinical picture and is characterized by either (or both) of the following:
 1. depressed mood or markedly diminished interest or pleasure in all, or almost all, activities
 2. elevated, expansive, or irritable mood

- B.** There is evidence from the history, physical examination, or laboratory findings of either (1) or (2):
 - 1.** the symptoms in Criterion A developed during, or within a month of, Substance Intoxication or Withdrawal.
 - 2.** medication is etiologically related to the disturbance
- C.** The disturbance is not better accounted for by a Mood Disorder that is not substance induced.
- D.** The disturbance does not occur exclusively during the course of a delirium.
- E.** The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.

DSM-IV Diagnostic Criteria for Substance Induced Psychotic Disorders (Summary of Criteria)

- A.** Prominent hallucinations or delusions. Note: Do not include hallucinations if the person has insight that they are substance induced.
- B.** There is evidence from the history, physical examination, or laboratory findings of either (1) or (2):
 - a.** the symptoms in Criterion A developed during, or within a month of, Substance Intoxication or Withdrawal.
 - b.** medication use is etiologically related to the disturbance
- C.** The disturbance is not better accounted for by a Psychotic Disorder that is not substance induced. Evidence that the symptoms are better accounted for by a Psychotic Disorder that is not substance induced might include the following: the symptoms precede the onset of substance use (or medication use); the symptoms persist for a substantial period of time (e.g., about a month) after the cessation of acute withdrawal or severe intoxication, or are substantially in excess of what would be expected given the type or amount of the substance used or duration of use; or there is other evidence that suggests the existence of an independent non-substance-induced Psychotic Disorder (e.g., a history of recurrent non-substance-related episodes).
- D.** The disturbance does not occur exclusively during the course of a delirium.

DSM-IV Diagnostic Criteria for Substance Induced Anxiety Disorders (Summary of Criteria)

- A.** Prominent anxiety, Panic Attacks, or obsessions or compulsions predominate in the clinical picture.
- B.** There is evidence from the history, physical examination, or laboratory findings of either (1) or (2):
 - a.** the symptoms in Criterion A developed during, or within 1 month of, Substance Intoxication or Withdrawal.
 - b.** medication is etiologically related to the disturbance

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Table 1
Demographics of 189 methamphetamine (MA) dependent subjects¹

Gender, N (%)	
Female	63 (33.3)
Male	126 (66.7)
Age, years, mean ($\pm$ s.d.)	37.6 (9.0)
Education, years, mean ($\pm$ s.d.)	12.9 (2.3)
Duration of Problematic MA Use, years, mean ($\pm$ s.d.)	10.17 (8.7)
Female	10.9 (8.2)
Male	9.9 (9.0)
Past 30 days MA Use, days, mean ($\pm$ s.d.)	12.4 (10.1)
Female	12.2 (10.6)
Male	12.5 (9.9)
Race, N (%)	
Caucasian	133 (70.4)
African American	15 (7.9)
Native American	11 (5.8)
Asian/Pacific Islander	2 (1.1)
Hispanic	18 (10.1)
Multiracial	6 (3.2)
Marital status, N (%)	
Married	20 (10.6)
Living with partner	16 (8.5)
Regular sex partner	9 (4.8)
Separated/divorced	67 (35.4)
Single never married	72 (38.1)
Sexual orientation, N (%)	
Heterosexual	125 (66.1)
Bisexual	23 (12.2)
Gay/lesbian	33 (17.5)
Declined to state	5 (2.6)

¹ Demographic data were missing from N subjects in the following categories: Race: N=4; Marital Status: N=5; Sexual Orientation: N=3. MA usage data were available from 169 subjects.

Table 2
Prevalence of other lifetime substance use disorders in 189 currently methamphetamine (MA) dependent subjects

	Full Sample	Women	Men
Substance use disorders	<u>153 (81.0%)</u>	<u>47 (74.6%)</u>	<u>106 (84.1%)</u>
Substance dependence - any other drug	108 (57.1%)	30 (47.6%)	78 (61.9%)
<i>Alcohol</i>	62 (32.8%)	16 (25.4%)	46 (36.5%)
<i>Cocaine</i>	51 (27.0%)	13 (20.6%)	38 (30.1%)
<i>Cannabis</i>	28 (14.8%)	8 (12.7%)	20 (15.9%)
<i>Opioid</i>	22 (11.6%)	7 (11.1%)	15 (11.9%)
<i>Sedatives, hypnotics and anxiolytics</i>	15 (7.9%)	6 (9.5%)	9 (7.1%)
<i>Hallucinogen</i>	5 (2.6%)	2 (3.2%)	3 (2.4%)
Substance abuse - any other drug	105 (55.6%)	29 (46.0%)	76 (60.3%)
<i>Cannabis</i>	46 (24.3%)	8 (12.7%)	38 (30.1%)
<i>Alcohol</i>	32 (16.9%)	13 (20.6%)	19 (15.1%)
<i>Hallucinogen</i>	15 (7.9%)	10 (15.9%)	5 (4.0%)
<i>Cocaine</i>	12 (6.3%)	3 (4.8%)	9 (7.1%)
<i>Sedatives, hypnotics and anxiolytics</i>	3 (1.6%)	1 (1.6%)	2 (1.6%)
<i>Opioid</i>	1 (0.8%)	0	1 (0.8%)
Substance-induced disorders	<u>66 (34.9%)</u>	<u>19 (30.2%)</u>	<u>47 (37.3%)</u>

Table 3
Prevalence of lifetime mood disorders in 189 methamphetamine (MA) dependent subjects

	Full Sample	Women	Men
Substance-induced mood disorder	28 (14.8%)	13 (20.6%)	15 (11.9%)
<i>Methamphetamine</i>	20 (10.6%)	9 (14.3%)	11 (8.7%)
<i>Unknown substance</i>	8 (4.2%)	4 (6.3%)	4 (3.2%)
Mood disorders	<u>61 (32.3%)</u>	<u>22 (34.9%)</u>	<u>39 (31.0%)</u>
Major depressive disorder	24 (12.7%)	12 (19.0%)	12 (9.5%)
Bipolar disorder	11 (5.8%)	4 (6.3%)	7 (5.5%)
Depression NOS	11 (5.8%)	4 (6.3%)	7 (5.5%)
Dysthymia	5 (2.6%)	1 (1.6%)	4 (3.2%)

Table 4
Prevalence of lifetime psychotic disorders in 189 methamphetamine (MA) dependent subjects

	Full Sample	Women	Men
Substance-induced psychotic disorder	45 (23.8%)	9 (14.3%)	36 (28.6%)
With delusions	31 (16.4%)	3 (4.8%)	28 (22.2%)
<i>Methamphetamine</i>	25 (13.2%)	1 (1.6%)	24 (19.0%)
<i>Unknown substance</i>	6 (3.2%)	2 (3.2%)	4 (3.2%)
With hallucinations	28 (14.8%)	9 (14.3%)	19 (15.1%)
<i>Methamphetamine</i>	21 (11.1%)	6 (9.5%)	15 (11.9%)
<i>Unknown substance</i>	5 (2.6%)	3 (4.8%)	2 (1.6%)
<i>Cocaine</i>	1 (0.5%)	0	1 (0.8%)
<i>PCP</i>	1 (0.5%)	0	1 (0.8%)
Psychotic disorders	9 (4.8%)	2 (3.2%)	7 (5.5%)
Psychosis NOS	5 (2.6%)	2 (3.2%)	3 (2.4%)
Schizophrenia	3 (1.6%)	0	3 (2.4%)
Brief psychotic episode	1 (0.5%)	0	1 (0.8%)

Table 5
Prevalence of lifetime anxiety and other disorders in 189 methamphetamine (MA)
dependent subjects

	Full Sample	Women	Men
Substance-induced anxiety disorder			
<i>Methamphetamine</i>	7 (3.7%)	0	7 (5.5%)
<i>Unknown substance</i>	0	0	0
Anxiety disorders	<u>46 (24.3%)</u>	<u>22(34.9%)</u>	<u>24 (19.0%)</u>
Post traumatic stress disorder	23 (12.2%)	12 (19.0%)	11 (8.7%)
Generalized anxiety disorder	14 (7.4%)	9 (14.3%)	5 (4.0%)
Obsessive-compulsive disorder	7 (3.7%)	1 (1.6%)	6 (4.8%)
Panic disorder without agoraphobia	5 (2.6%)	3 (4.8%)	2 (1.6%)
Panic disorder with agoraphobia	5 (2.6%)	4 (6.3%)	1 (0.8%)
Conversion disorder	2 (1.1%)	1 (1.6%)	1 (0.8%)
Anxiety NOS	2 (1.1%)	1 (1.6%)	1 (0.8%)
Other disorders	<u>14 (7.4%)</u>	<u>4 (6.3%)</u>	<u>10 (7.9%)</u>
Adjustment disorder	5 (2.6%)	1 (1.6%)	4 (3.2%)
Eating disorder	5 (2.6%)	2 (3.2%)	3 (2.4%)
Mental disorder due to general medical condition	3 (1.6%)	1 (1.6%)	2 (1.6%)
Hypochondriasis	1 (0.5%)	0	1 (0.8%)