Undiagnosed Drug Misuse Among Admissions to Psychiatric Day Treatment and Prediction of Early Exit

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Abstract: A challenge for psychiatric treatment programs is to accurately identify individuals with drug misuse problems at admission to treatment. Consecutive new admissions to an urban continuing day treatment program (n=229) during 2003-2005 were recruited and their treatment status was determined after one year. At admission, 34% were diagnosed with drug dependence/abuse based on a DSM-IV clinical interview, whereas 69% were found to be misusing drugs based on a research protocol consisting of self-reports of use within the past 30 days and drug toxicologies. Drug misuse as identified by the research protocol predicted a clinically meaningful outcome - early exit from treatment (relative risk = 2.7, $p < .01$), but DSM-IV diagnosis of drug use disorder was not predictive. These results suggest that psychiatric outpatient programs should consider adding an assessment for drug misuse to a comprehensive clinical assessment at admission to treatment.

Keywords: Substance use, psychiatric day treatment, comorbidity, dual diagnosis, mental illness, treatment outcome.

INTRODUCTION

Comorbidity of mental illness and substance misuse is a significant problem both in the general and in clinical populations. Such co-occurring problems are associated with poorer treatment outcomes both for patients in substance abuse treatment [1, 2] and in mental health treatment, where the consequences include lower medication adherence, higher re-hospitalization and emergency room visits, homelessness, criminality and violence, suicide attempts, increased fluctuation and severity of psychiatric symptoms, legal problems, family stress, HIV/HCV infection, and early attrition from treatment [3-5]. Moreover, comorbid DSM-IV disorders are more severe and chronic than single disorders [6].

There are a variety of evidence-based or promising treatments currently available for individuals with co-occurring mental illness and substance misuse [7, 8]. However, a challenge for psychiatric treatment programs, particularly outpatient programs, is to accurately identify substance-misusing individuals at admission to treatment. This would allow simultaneous treatment for substance misuse problems to be offered as early as possible in the treatment process and hopefully improve outcomes. Thus, the present study (1) implemented and compared different measures for diagnosing illicit drug use among new admissions to psychiatric day treatment and (2) determined the utility of the alternative measures in predicting a clinically significant outcome, early attrition from treatment [1].

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IDENTIFYING ILLICIT DRUG USE AMONG PSYCHIATRIC PATIENTS

Self-report measures of drug misuse, no matter how carefully constructed, are susceptible to patients' ability and willingness to disclose illegal and/or stigmatized behaviors. An informative study found that state-of-the art self-report screening instruments failed to identify as recent substance misusers one-quarter to one-half of inpatients who were identified as such by a "gold standard" criterion [9]. The latter was defined as being rated a substance misuser by clinicians who accumulated knowledge about these patients in the community over the previous six months or a positive substance dependence/abuse diagnosis on the Structured Clinical Interview for DSM Disorders [10, 11] at hospital admission. Actually, this study may overstate the efficiency of self-report screening, due to the employment of multiple measures: seven screening instruments, the SCID, and a medical history exam, all of which attempted to elicit information about substance misuse. This may have resulted in more disclosures than would have been obtained had any single instrument or procedure been administered in isolation, as would be the case in routine practice. Additionally, this study yielded insufficient data about the efficiency of screening for cocaine, arguably the most stigmatized substance included, because only 7.5% of the sample was classified as cocaine-using by the "gold standard." Tiet and colleagues [12] reviewed 15 existing substance screening instruments and concluded that "current instruments are not appropriate for routine screening of psychiatric patients," even without considering the likelihood of underreporting due to stigma or fear of consequences [13].

Several studies have compared self-reported substance misuse with biological tests in psychiatric populations. In a study of admissions to a Swiss psychiatric hospital,

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agreement rates between clinical interviews and urinalyses for various illicit drugs were high, but only 54% of new patients agreed to both interviews and urine screening [14]. In contrast, among a sample of new admissions to psychiatric hospitals in France, 52% of urine-positive patients failed to admit illicit drug use [15]. In a mixed inpatient/outpatient sample of people with schizophrenia, 16% admitted illicit drug use or prescription drug misuse in the past three months, but 33% tested positive by urinalysis or hair analysis [16]. Shaner and colleagues [17] found that clinicians failed to recognize cocaine use among patients admitted to a psychiatric hospital who tested urine-positive for cocaine at admission as part of research.

This prior research involving mostly inpatients indicates that clinical interviews and other self-report measures may not be sufficiently sensitive to detect drug misuse and that drug testing could be more effective in screening for drug misuse among psychiatric outpatients, where patients potentially have continued access to drugs subject to misuse after treatment admission. Biochemical tests, unlike self-report measures, are not context or population-dependent. For instance, voluntary *vs* involuntary commitment status could substantially affect willingness to disclose substance misuse [9]. Of course, biochemical tests also have their own limitations, such as limited windows of detection of drug misuse, possible intrusiveness of specimen collection and incomplete coverage of the relevant drugs subject to misuse.

STUDY OBJECTIVES

Previous studies of psychiatric patients' willingness to disclose drug misuse were conducted primarily in psychiatric inpatient samples, whereas the great majority of psychiatric treatment today is provided in outpatient settings. There are little data on psychiatric outpatients' willingness to disclose drug misuse at admission to treatment nor on the accuracy of such self-reports. The present study has two objectives:

1. To determine the prevalence of illicit drug use among new admissions to psychiatric outpatient treatment using alternative measures of drug misuse – clinical interviews conducted by program psychiatrists, self-reports of drug misuse to researchers and drug toxicologies.
2. To determine how accurately different measures of illicit drug use at admission predict a clinically significant outcome - early exit from treatment.

This research is intended to help formulate recommendations for more effective screening of psychiatric outpatients for substance misuse.

METHODS

Setting

The setting was a psychiatric continuing day treatment program located in New York City. Patients in this program usually have a three times a week, half-day schedule, either in the morning or afternoon, and participate in one to four groups per day. Patients are offered breakfast and lunch on days they come to the program. The program provides treatment for persons with single psychiatric disorders as well as for those dually diagnosed with psychiatric and substance use disorders. Specialized groups are offered for patients with co-occurring disorders, such as ''Substance Abuse Awareness'' "Relapse Prevention," and 12 Step-based mutual aid.

Study Sample

Two cohorts of patients newly admitted to the program were recruited as part of a larger research study, the first from March to December 2003 (n= 81) and the second from May 2004 to December 2005 (n=148), for a total of 229 patients. Patients were referred from various mental health and drug treatment settings, including psychiatric inpatient units, mental health residences, other outpatient mental health clinics, outpatient addiction treatment clinics, or were self-referred through community contacts. Consecutive admissions to the program were referred by a program intake counselor to a study research assistant for eligibility assessment. Patients were ineligible if they were younger than age 18, did not understand or speak English, appeared intoxicated on drugs or alcohol, carried a diagnosis of mental retardation, were deemed actively psychotic by the clinic's intake coordinator, or appeared unable to understand and give informed consent. Four hundred and eighty-one new admissions were assessed for study eligibility, of whom 60 were ineligible and 31 declined to participate, resulting in 390 patients completing an informed consent and being enrolled in the study. Of these, contact was lost with 142 before the baseline research protocol could be conducted (they did not return to the program for treatment), 11 withdrew consent, 5 transferred to another program and three were determined ineligible after the consent, resulting in 229 patients completing the baseline research protocol, the sample for this analysis.

Participants received compensation of $20.00 for the baseline interview and biological specimens. Participants knew before the interview that they would be asked for specimens after the interview. The study protocol was approved by the Institutional Review Boards of the host research site, the Albert Einstein College of Medicine, and the organization that conducted the study, National Development and Research Institutes.

Study Measures

The alternative measures relating to substance use were:

DSM-IV Drug Dependence or Abuse Diagnoses (Current). At admission to the program, program psychiatrists conducted clinical interviews and classified patients according to DSM-IV criteria. "Current" indicates diagnostic criteria must have been met within the previous 12 months. The diagnoses (and diagnostic codes) included in this analysis were: cocaine (304.20, 305.60), opioids (304.00, 305.50), marijuana/cannabis) (304.30, 305.20), sedatives (304.10, 305.40), amphetamine (304.40, 305.70), and polysubstance (304.80). These diagnoses were part of the standard intake procedure for the program. When referring to these diagnoses collectively, the paper will term them "DSM-IV drug use disorders" or, for an individual drug, "DSM-IV cocaine disorder." (Alcohol-only disorder was diagnosed, but not included in the present analysis, since the focus of the parent study was illicit drugs and no toxicologies were obtained for alcohol.)

Drug Misuse Self-Reports - Obtained from the Drug/Alcohol Use section of the Addiction Severity Index (ASI) by study research interviewers as part of a comprehensive research interview at each patient's admission to the program [18]. The ASI items include a list of drugs subject to misuse, asking the number of days in the past 30 days that each drug was used.

Drug Toxicologies – Urine and head hair specimens were obtained by the researchers at admission. Urine toxicology was conducted by on-site immunoassay (Roche TestCup) for opiates (morphine), cocaine metabolite (benzoylecgonine), marijuana (THC), phencyclidine, and amphetamines. The probable windows of detection for urine screening are the prior 1-2 days for opiates, 1-4 days for cocaine, 1 day to 5 weeks for marijuana, 2-8 days for phencyclidine and 1-2 days for amphetamines. Urine specimens were obtained for 96.8% of the sample. Hair analysis was conducted by radioimmunoassay by Psychemedics Corporation for opiates and cocaine metabolite. A 1.5" specimen of scalp hair as measured from the root was analyzed, which gives an approximate window of detection of 90 days. Hair specimens were obtained for 55.4% of the sample. The primary reason for not obtaining hair was men's predominant short hair styles ("buzz cuts") that either made it impossible to cut hair or would have left an obvious bald spot not acceptable to respondents. Body hair was not obtained as a substitute for scalp hair on the advice of the laboratory, since body hair grows at a variable rate and often stops growing ("latent hair"), which would make the test results not comparable with scalp hair.

The "research protocol" was defined as the combined results for research self-report, urinalysis and hair analysis; a patient was classified as positive for a drug if any of these indicators were positive.

"Early exit from treatment" was defined as leaving before 90 days within a 12 month post-admission window. This was determined from program records; 20% of the sample exited early. Exit from outpatient treatment within three months has been identified with a lower rate of remission from mental illness symptoms [19] and from drug misuse [20].

The study includes additional baseline variables for potential covariate control (see Table **1**), including DSM-IV psychiatric diagnoses made by the program psychiatrists, the Colorado Symptoms Index [21] and the Medication Adherence Rating Scale [22].

Hypotheses and Statistical Analyses

The prevalence of illicit drug use prior to admission using alternative measures of drug misuse is represented by the percentage of patients classified as positive on each measure. Traditional 95% confidence intervals are calculated for each percentage. This analysis is largely exploratory; we generally do not hypothesize specific differences in prevalence rates among the measures. There is one exception of special clinical interest. We hypothesize that drug toxicology will show higher rates of drug misuse than clinical diagnosis of DSM-IV drug dependence/abuse, overall for illicit drug use and also for each individual drug, assessed by McNemar's Test [23]. This is predicted because psychiatric patients may be reluctant to disclose drug misuse to clinicians and in addition, not all drug misuse disclosed to clinicians may meet DSM-IV criteria.

Table 1. Sample Characteristics at Admission to Treatment (in Percent, n = 229)

Male	60
Hispanic	41
Black	42
White	18
Age (in years, mean and s.d.)	39 (9.1)
Currently employed	3
Public assistance (welfare, disability)	69
Unstable housing (shelter, hotel, on the street)	16
Ever received substance abuse treatment	77
Ever received psychiatric treatment	90
Attended 12-step groups, past 6 months	64
Colorado Symptoms Index (CSI) (mean, s.d.)	2.7 (1.0)
Medication non-adherence (MARS) (mean, s.d.)	3.8 (2.5)
Major Depression	25
Bipolar	13
Other Mood Disorders	13
Schizoaffective	13
Schizophrenia	13
Psychotic Disorders NOS	7
Anxiety Disorders	5
Other Disorders	13

Relative risks (RR) for early exit from the program are calculated for various measures: DSM-IV drug use disorder diagnosis, the research self-reports and the toxicology results. For this analysis, relative risk (RR) for early exit is defined as the percentage of patients classified as drug misusers who exit early, divided by the percentage of patients classified as non-users who exit early [24]. An RR of 1.0 indicates no relationship between illicit drug use and early exit, an RR of greater than 1.0 indicates that illicit drug users are more likely to exit early than non users, and an RR of less than 1.0 indicates that illicit drug users are less likely to exit early than non-users (all subject to statistical significance testing). The primary hypothesis is that patients classified by a research protocol as drug misusers prior to admission will be more likely to exit treatment early than patients classified as non-users; this is tested by chi-square at p = 05 (2-tailed).

The exploratory feature of the analysis is to examine whether such an overall finding may be conditioned on the specific measure of drug misuse employed and/or on the specific type of illicit drug use. Several drug misuse measures are explored, including combinations of self-reports and toxicologies. The same measures are replicated for each of three individual drugs or drug classes – cocaine, opiates and marijuana. The measures clearly are not independent and are not intended to be. Moreover, except for

the overall composite measure, we do not hypothesize that any of these individual measures will be significantly associated with early exit. Thus, we do not report tests of statistical significance for these individual indicators nor should these data be considered a sort of multiple comparison data. Instead, the individual indicators that are incorporated into the overall composite measure are best considered as "items" sampled from the domain of items measuring the underlying construct of "illicit drug use" [25]. In our study, these individual indicators are not randomly selected from the domain of possible indicators, but purposively selected based on an understanding of the behavior and effective measurement of it. Thus, we also apply the concept of "triangulation," which pertains to using two or more different measurement techniques to verify results [26].

Although no individual drug misuse indicator need be or was hypothesized to be related to early exit, the logic of the domain model of sampling is that there should be a *consistent pattern of relationship* to early exit. Thus as a corollary, we also hypothesize that the indicators of illicit drug use should exhibit a consistent pattern of relationship to early exit, which we operationalized by determining whether the relative risks greater than one exceed the relative risks less than one; this hypothesis was tested by the binomial sign test.

RESULTS

Characteristics of Sample

The majority of the sample was male and from minority groups, with an average age of 39 years. Most (69%) were supported by public assistance and almost all had received prior treatments for psychiatric problems and substance misuse. At admission to this program, the most frequent primary psychiatric diagnosis was major depression (25%), followed by equal frequencies of bipolar (13%), other mood (13%), schizoaffective (13%) and schizophrenic (13%) disorders (Table **1**).

Drug Misuse Prevalence at Admission

The prevalence of any DSM-IV drug use disorder as diagnosed by psychiatrists through clinical interviews at program admission was 34.2% (Table **2**, last column). The prevalence of misuse of any drugs was 51.4% by research self-report, 53.0% by urinalysis, 53.7% by hair analysis, 60.2% by any toxicology (urine or hair) and 69.4% by the entire research protocol. Thus, the rates of drug misuse prevalence as estimated by research self-report, any toxicology and the entire research protocol were, respectively, 1.5 (51.4/34.2), 1.8 (60.2/34.2) and 2.0 (69.4/34.2) times the rate of drug use disorders determined by clinical interview (Table **2**, computed from last column).

The results are similar for the individual drugs. The rates of cocaine use prevalence as estimated by research self-report, any toxicology and the entire research protocol were, respectively, 3.0 (32.0/10.8), 3.5 (38.0/10.8) and 4.1 (44.6/10.8) times the rate of cocaine use disorder as determined by clinical interviews (Table **3**, computed from last column). The rates of opiate/opioid misuse prevalence as estimated by research self-report, any toxicology and the entire research protocol were, respectively, 1.2 (13.5/11.1), 1.6 (18.1/11.1) and 1.9 (21.6/11.1) times the rate of opiate/opioid use disorder as determined by clinical interviews (Table **4**, computed from last column). It should be noted that unlike the toxicologies, the reports of misuse were not limited to opiates but included opioid analgesics such as hydrocodone and oxycodone. The rates of marijuana use prevalence as estimated by research self-report, urinalysis and the entire research protocol were, respectively, 4.0 (30.6/7.7), 3.8 (29.3/7.7) and 5.0 (38.6/7.7) times the rate of marijuana (cannabis) use disorder determined by clinical interviews (Table **5**, computed from last column). (Prevalences of amphetamine and phencyclidine misuse were too low to allow tabulation.)

Drug Misuse as Predictor of Early Exit from Treatment

The research protocol composite measure of drug misuse significantly predicted early exit (RR=2.7, p<.01)). Specifically, dividing the percentage of patients who self-report drug misuse and exit early – 24.0% - by the percentage of patients who do not report drug misuse and exit early – 8.8% - gives a relative risk of 2.7. In contrast, DSM-IV drug use disorders did not predict early exit from treatment (RR = 1.0, Table **2**).

To better understand why the research protocol measure was related to early exit, we compute similar relative risks for selected components of the composite measure. Table **2** shows that various components also yield relative risks of

Table 2. Risk of Early Exit (in Percent) by Drug Indicators for Aggregated Drugs

Type of Indicator	Indicator Negative		Indicator Positive		Relative Risk for Early Exit	Drug Prevalence (%, 95% C.I.)
	%	(N)[c]	%	(N)[c]		
1. DSM-IV Drug Use Disorder Diagnosis by Clinicians	19.2	(146)	19.7	(76)	1.0	34.2 (6.2)
2. Research Self- Report	11.1	(108)	27.2	(114)	2.5	51.4 (6.7)
3. Urine-Positive	13.9	(101)	23.7	(114)	1.7	53.0 (6.7)
4. Hair-Positive	8.8	(57)	25.8	(66)	2.9	53.7 (8.8)
5. Toxicology-Positive[a]	13.0	(86)	23.8	(130)	1.8	60.2 (6.5)
6. Research Protocol[b]	8.8	(68)	24.0	(154)	2.7**	69.4 (6.1)

[a] Positive by urine or hair.
[b] Positive by self-report, urine or hair **p<.01.
[c] These two numbers do not sum to 229 because of missing data.

Table 3. Risk of Early Exit (in Percent) by Indicators for Cocaine

Type of Indicator	Indicator Negative		Indicator Positive		Relative Risk for Early Exit	Cocaine Prevalence (%, 95% C.I.)
	%	(N)	%	(N)		
1. DSM-IV Cocaine Disorder Diagnosis by Clinicians	18.2	(198)	29.2	(24)	1.6	10.8 (4.1)
2. Research Self- Report	13.2	(151)	32.4	(71)	2.5	32.0 (6.1)
3. Urine-Positive	17.6	(165)	24.0	(50)	1.4	23.3 (5.7)
4. Hair-Positive	14.1	(64)	22.0	(59)	1.6	48.0 (8.8)
5. Toxicology-Positive [a]	17.2	(134)	23.2	(82)	1.4	38.0 (6.5)
6. Research Protocol [b]	13.0	(123)	27.3	(99)	2.1	44.6 (6.5)

[a]Positive by urine or hair.
[b]Positive by self-report, urine, or hair.

Table 4. Risk of Early Exit (in Percent) by Indicators for Opiates/Opioids

Type of Indicator	Indicator Negative		Indicator Positive		Relative Risk for Early Exit	Opiate/Opioid Prevalence (%, 95% C.I.)
	%	(N)	%	(N)		
1. DSM-IV Opiate/Opioid Disorder Diagnosis by Clinicians	20.2	(198)	12.5	(24)	0.6	11.1 (4.1)
2. Research Self- Report	18.8	(192)	23.3	(30)	1.2	13.5 (4.6)
3. Urine-Positive	18.2	(187)	25.0	(28)	1.4	13.0 (4.5)
4. Hair-Positive	12.9	(101)	40.9	(22)	3.2	14.7 (6.3)
5. Toxicology-Positive [a]	16.9	(177)	30.8	(39)	1.8	18.1 (5.1)
6. Research Protocol [b]	17.2	(174)	27.1	(48)	1.6	21.6 (5.4)

[a]Positive by urine or hair for opiates only.
[b]Positive by self-report (for opiate/opioid misuse), urine (for opiates) or hair (for opiates).

Table 5. Risk of Early Exit (in Percent) by Indicators for Marijuana (Cannabis)

Type of Indicator	Indicator Negative		Indicator Positive		Relative Risk for Early Exit	Marijuana Prevalence (%, 95% C.I.)
	%	(N)	%	(N)		
1. DSM-IV Marijuana Disorder Diagnosis by Clinicians	18.5	(200)	29.4	(17)	1.6	7.7 (3.6)
2. Research Self- Report	16.9	(154)	25.0	(68)	1.5	30.6 (6.1)
3. Urine-Positive	16.4	(152)	25.4	(63)	1.6	29.3 (6.1)
4. Hair-Positive	N/A					
5. Toxicology-Positive [a]	16.4	(152)	25.4	(63)	1.6	29.3 (6.1)
6. Research Protocol [b]	15.2	(154)	25.3	(68)	1.7	38.6 (6.4)

[a]Positive by urine.
[b]Positive by self-report or urine.

greater than one: self reports of any drug misuse (RR = 2.5), urine-positives (RR = 1.7), hair-positives (RR = 2.9) and any toxicology-positives (RR=1.8).

We also examined whether the results for the aggregate drug misuse measure were conditioned on the specific drugs included in the measure. For cocaine, the research self-reports (RR = 2.5) and the research protocol as a whole (RR = 2.1) most strongly predicted predict early exit (Table **3**). For opiates/opioids, being hair-positive (RR = 3.2) most strongly predicted early exit (Table **4**). For marijuana, none of the research indicators of misuse stood out as strongly related to early exit (Table **5**).

We determined whether there was an overall pattern suggesting a relationship between drug misuse and early exit. Of 18 research indicators of drug misuse in Tables **2-5**, including the composites, all 18 showed a RR of greater than one ($p < .001$, binomial sign test).

The relationship between the DSM-IV drug use disorder indicators and early exit was inconsistent. Of four such associations, the RRs were 1.0, 1.6, 0.6. and 1.6 (Tables **2-5**), not suggesting any kind of a pattern.

Finally, we examined whether toxicology provided a potential "clinical surplus" over DSM-IV drug use disorder

Table 6. "Clinical Surplus" Provided by Toxicologies[a] Over DSM-IV Drug Use Disorder Diagnoses in Identifying Drug Misuse at Admission

Any DSM-IV Drug Use Disorder	Any Drug Toxicology		McNemar Test[b]
	Negative	Positive[a]	
None	65	75	
One or more	21	54	p< .000
DSM-IV Cocaine Disorder	Cocaine Toxicology		
	Negative	Positive[a]	
No	121	70	
Yes	13	11	p< .000
DSM-IV Opiate/Opioid Disorder	Opiate Toxicology		
	Negative	Positive[a]	
No	159	32	
Yes	17	7	p< .044
DSM-IV Marijuana Disorder	Marijuana Toxicology		
	Negative	Positive	
No	149	49	
Yes	3	14	p< .000

[a]Positive by urine or hair
[b]All tests except opiate/opioids significant at p<.01 after Bonferroni adjustment for multiple comparisons.

diagnoses in identifying drug misuse at admission. Table **6** shows this analysis. Using the results of toxicology, identification of drug misuse in the aggregate was increased by 100% (75/75 X 100), identification of cocaine use increased by 292% (70/24 X 100), identification of opiates/opioids increased by 133% (32/24 X 100) and identification of marijuana by 288% (49/17 X 100).

Testing for Potential Confounding Variables

We extended the analysis by performing exploratory tests of patient characteristics to determine what, in addition to drug misuse, may predict early exit from treatment; in particular, the characteristics listed in Table **1** were examined. None of these characteristics, including psychiatric diagnoses, were significantly associated with early exit. Since there were no observed potential confounding variables, we do not conduct multivariate analysis such as multiple logistic regression.

DISCUSSION

The prevalence of drug misuse among admissions to psychiatric treatment is considerably higher than identified through clinical interviewing resulting in DSM-IV diagnoses of drug use disorders. Of course, misuse of a drug may not be the same as meeting criteria for a DSM-IV diagnosis of drug dependence or abuse. The critical finding, however, is that DSM-IV drug diagnoses *failed to predict* a clinically significant treatment outcome - early exit from treatment - whereas the more broadly defined measures of drug misuse often did predict early exit (except specifically for marijuana).

The different indicators of drug dependence or misuse measure different time periods of use or have different "windows of detection." However, we could not anticipate the implications of that in advance. That is because there are also other differences among the methods, such as research confidentiality (research protocol indicators *vs* the DSM-IV clinical interview by program psychiatrists); patients' ability or willingness to disclose drug misuse to anyone (ASI self-reports and DSM clinical interview *vs* toxicologies); and DSM- defined drug dependence/abuse criteria *vs* self-reports of any misuse (DSM clinical interview *vs* ASI self-reports). These varied differences among the methods made it unclear what to expect in the prevalence estimates. If the time period covered were the only or prime factor affecting the prevalence estimate, the DSM clinical interview, which asks about the last 12 months, would be expected to yield the highest prevalence, but it actually yields the lowest prevalence.

These research results suggest that psychiatric outpatient programs should consider using a structured drug misuse measure such as the drug/alcohol use questions from the Addiction Severity Index (12 questions) and/or drug toxicologies as part of a comprehensive assessment at admission to treatment. Such assessments are not a standard part of intake assessment at mental health outpatient programs, despite the substantial degree of drug misuse comorbidity in the mental health outpatient population. Determination of drug misuse at admission to treatment would sensitize clinicians to the higher risks of early attrition and perhaps other negative events for patients with drug misuse problems, which then could be addressed early in treatment. Detection of drug misuse at admission would also promote openness and disclosure to assist clinicians in helping patients more effectively. This does presume that the information would not be employed in a manner that could be perceived as punitive by patients; careful training of clinical staff in this regard is essential.

Although urinalysis is a standard component of addiction outpatient treatment, it nevertheless can be considered rather intrusive. The technology of saliva analysis for drugs of abuse has been improving and appears to provide results comparable to urinalysis at least for cocaine and opiates [27-29].

Hair analysis was more effective than urinalysis in identifying cocaine/crack use, but hair specimens could be obtained from only 55% of the subjects, mainly due to men's very short hair styles in this sample; but this may not apply to other programs in other locations at other times.

One study limitation is that the ASI alcohol/drug use questions were administered as part of a confidential research interview and may not yield the same results when administered by a clinician. For that reason, toxicologies at admission may prove to be the preferred diagnostic procedure in routine practice. The study found that toxicologies could potentially provide a clinical surplus of drug misuse information over what is ordinarily obtained by DSM drug use disorder diagnoses at admission.

Another limitation is that the study did not obtain during-treatment or clinician data that may also help to explain early exit, for example, therapeutic alliance [30].

The study was conducted at one urban psychiatric day treatment program. While this appears to be a "typical" program, the generality of the results cannot be affirmed.

The study was funded to examine illicit drug use and as such we did not address biomarkers for alcohol use.

Finally, the actual utility of drug misuse assessment at admission to mental health treatment must be determined by additional studies.

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