OVER- AND UNDERREPORTING OF RECENT DRUG USE IN SUBJECTS ENTERING AN INPATIENT DETOXIFICATION UNIT

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Abstract

Underreporting of drug use is commonly found more often than overreporting. Overreporting may, however, occur in particular settings, e.g. in subjects entering a detoxification program.

Methods: Self-reports (standardized semi structured interview) of recent drug use of 554 patients consecutively admitted to a drug detoxification inpatient unit were compared to urine screening results at admission. Overreporters were defined as indicating a consumption of a specific drug during the preceding 7 days (3 days for cocaine) which was not confirmed by the urine screening. Underreporters denied consumption but presented positive urine.

Results: Overreporting was especially prevalent for opiates, and relatively more frequent (59.9% heroin, 40% methadone) than underreporting (6.8% heroin, 20.4% methadone). Signs of intoxication at admission, current methadone substitution, and previous institutional detoxification experiences influenced opiate overreporting.

Conclusions: Some of the retained parameters predicting overreporting of recent opiate consumption corroborated the hypothesis of patients trying to receive more consideration from the therapeutic team and to get more intensive pharmacological care.

Key words: Urine screening; Substance related disorders; Self report

INTRODUCTION

Urine screening is a commonly used technique in the field of substance abuse. Numerous researchers have used this instrument in studies regarding treatment outcome. It has the advantage permitting rather objective information concerning the drug consumption at a precise time. Moreover, urine screening is also used as clinical evaluation tool in various treatment services. It may be used with diverse objectives for e.g. as an indicator for the clinical monitoring, as a treatment condition, as an indication for medical prescription and dosages, as a way of repression and control, etc.

However, as such it has the disadvantage to engender costs. Considering this fact, several studies were made to evaluate the degree of validity of self reported drug use [1-3]. The preliminary results indicated that there was a high degree of validity of self reports when these measures were matched to biological measures, but several methodological flaws were soon identified and caused a considerable controversy regarding the validity of theses results.

It has been proposed that the accuracy of substance use self-reports could be influenced by several factors possibly co-occurring, such as the way questions were asked [4], the purpose of the data collection [5], the possibility to verify the information [6, 7], the presence of a third person during assessment [8], a current intoxication of the patient [9], etc. Thus there has been no agreement whether self-reports are sufficiently valid for clinical and research purposes [10, 11].

The general trend in most studies is for subjects to underreport their drug use. According to the social desirability theory [12], distortion of self-reports may occur as a function of the perceived acceptability of the behavior in question. This has been described in different settings and for different types of drug consumption [13, 14]. Underreporting may be as high as 70%. According to the social desirability theory this may vary in dependence to the context and the desirability perceived by the patient. The aim of the present study was to test the hypothesis, that patients entering an inpatient detoxification center would present relatively high proportions of overreporting. One rationale could be that they fear withdrawal symptoms and would try to get more drug treatment.

METHODS

The study was conducted in the inpatient drug withdrawal unit of the Psychiatric University Hospital of Lausanne, Switzerland. All participants were fitting, at least, one criteria of drug dependence according to ICD-10. Exclusion criteria were severe mental or physical deterioration, or poor use of French that would limit the reliability of answers provided. Self-reports (standardized semi structured interview) of recent drug use of 554 patients consecutively admitted to the drug detoxification unit were collected. At admission, all patients were questioned about their drug use (frequency, doses, and consumption mode) during the week preceding hospitalization, except for cocaine, for which the questioned period was 3 days.

Among the initial sample of 554 patients, 4 subjects (0.7%) had missing data. The mean age of the patients included into the analyses was 29.5 years (± 6.5 years) (range 17 –60 years) and 153 (27.8%) were female.

Urine samples were analysed using commercially available kits on an automated analyser (Cobas Integra 400, Roche Diagnostics AG, Rotkreuz, Switzerland). The urine analysis was semi quantitative and included the following substances: opiates, benzodiazepines, cocaine, amphetamines and related stimulant drugs, cannabis and methadone. According to the manufacturer, the following minimal concentrations are used as cut-off values for positive determinations: benzodiazepines and cannabis: 100 ng/ml; opiates, cocaine, methadone: 300 ng/ml; amphetamines: 500 ng/ml. By their pharmacological profile, zolpidem and zopiclone are benzodiazepine receptor agonists, and therefore are often considered as benzodiazepines like substances. However, they differ by their chemical structure and therefore are not detected by the COBAS method.

The 550 self-reports of recent drug use were matched with the results of urine samples made on the day of admission. Cohen's kappa was computed to assess the agreement between the two measures. As the urine test does not allow to discriminate methadone taken under medical surveillance from the black market's methadone, no difference was made in the data analysis between these two sources. Thus, patients indicating recent illegal methadone use and those who were known to be substituted in a therapeutic setting were merged into one unique group.

For each substance, "Overreporters" (OV), and "Underreproters" (UN) were defined. Overreporters indicated a consumption of a specific drug during the preceding 7 days (3 days for cocaine) which was not confirmed by the urine screening. Underreproters denied consumption but presented positive urine. The proportion of Overreporters was calculated using only data from patients who indicated recent consumption, and the percentage of Underreproters considered only those patients who denied such a consumption for the preceding 7 days (3 days for cocaine). For methadone the reports on medically prescribed (=substitution treatment) and nonprescribed (=black market) methadone were merged into one variable.

For each substance two binary logistic regression analyses were computed to predict overreporting and underreporting. The stepwise backward method was used to select variables with significant effects. The probability for removal was set at 0.1, and the classification cutoff at 0.5. The following variables were entered into the models: sex, age, marital status, addressing institution, current methadone substitution, signs of an intoxication at admission, previous institutional detoxifications, fatherhood/motherhood, punctuality at admission, years of addiction, programmed transfer to therapeutic community following the present hospitalization. Statistical analyses were performed with SPSS for Windows, version 11.0.0.

RESULTS

Table 1 summarizes the proportion of OV and UN for each drug and the level of agreement between urine tests and self reports. According to Cohen's Kappa coefficient, consistency was generally low (< 0.4) between self-report and urine drug screen. Compared to underreporting, overreporting seemed to be particularly prevalent with regard to methadone and heroin, whereas for the other drugs, underreporting seemed to be the more prominent problem.

Table 2 indicate the retained variables with a stepwise logistic regression to predict overreport of drug consumption. Overreporting benzodiazepines is most prevalent in the youngest patients, those over 41 years old overreporting 20x less often than those of the age class of < 20 years (p<0.05). The marital status had the same impact on overreporting of cannabis and methadone: Compared to newer married patients, married (or widowed) patients tended to overreport (nonsigificantly) more and separated/divorced patients to overreport significantly less. The institution who referred the patients to the detoxification program seemed to have some impact on overreporting of cocaine: Compared to subjects who were transferred from the local addiction outpatient clinic (which is under the same medical direction as the inpatient withdrawal unit), patients who were referred by social workers tended to overreport less often, the direct comparison, however, not being statistically significant. Whereas signs of intoxication at admission, as evaluated by a nurse, tended to almost halve the risk of heroin overreporting (p<0.1), it increased by 1.6 the odds of overreporting methadone (p<0.05). In patients being in a current methadone substitution program at admission, the risk of cannabis overreporting tended to be reduced (p<0.1), and the risk of heroin overreporting was increased (p<0.01). Having had a

Table 1. Urine screening and self-reported drug use.

Drug	Reported use	Urine-test negative					Urine-test positive					Cohens Kappa	
		Accurate negative		Over-reporting		Total	Accurate positive		Under-reporting		Total		
	N	n	%	n	%		n	%	n	%	N	k	p
heroine	433	75	40.1	112	59.9	187	331	93.2	24	6.8	355	0.375	< 0.001
methadone	332	153	60.0	102	40.0	255	230	79.6	59	20.4	289	0.257	< 0.001
cocaine	234	265	64.8	144	35.2	409	45	33.3	90	66.7	135	0.400	< 0.001
benzodiazepines	235	258	71.5	103	28.5	361	132	43.2	51	56.8	183	0.407	< 0.001
cannabis	231	238	69.2	106	30.8	344	125	42.5	75	57.5	200	0.307	< 0.001

Table 2. Stepwise logistic regression models to predict overreport of drug consumption.

	Overreporting Cannabis			Overreporting Cocaine			Overreporting Benzodiazepines			Overreporting Heroine			Overreporting Methadone		
	OR	CI 95%	p	OR	CI 95%	p	OR	CI 95%	p	OR	CI 95%	p	OR	CI 95%	p
Age range									0.018						
<20							1								
21 - 30							0.49	0.14 - 1.69	0.256						
31 - 40							0.28	0.08 - 1.01	0.051						
>41							0.05	0.00 - 0.49	0.011						
Marital status			0.017												0.035
Newer married	1												1		
Married/widowed	1.91	0.79 - 4.59	0.149										1.25	0.58- 2.67	0.570
Separated/divorced	0.38	0.17 - 0.88	0.024										0.36	0.16 - 0.82	0.035
Adressed by						0.037									
addiction outpatient clinic				1											
psychiatric outpatient clinic				1.18	0.46 - 3.05	0.731									
private practitionner				1.39	0.65 - 3.00	0.398									
social worker				0.42	0.16 - 1.09	0.074									
therapeutic community				1.31	0.43 - 4.01	0.633									
Other				0.41	0.16 - 1.09	0.073									
Seemed intoxicated										0.68	0.43 - 1.06	0.089	1.69	1.05 - 2.69	0.029
Current methadone substitution	0.62	0.35 - 1.07	0.086							1.87	1.18 - 2.97	0.007			
Previous institutional detoxifications												0.018			0.004
No previous										1			1		
In our withdrawal unit										0.68	0.34 - 1.36	0.275	3.13	1.58 - 6.19	0.001
Other institution										1.60	0.98 - 2.63	0.061	1.29	0.77 - 2.18	0.332
Positive predictive value	60.3%			65.8%			58.1%			74.6%			67.80%		

Other variables (and values) entered and retained in no model: Sex (male. female); Fatherhood/motherhood (yes, no); Years of addiction; Programmed subsequent stay in a therapeutic community (yes/no); Arrived on schedule (yes/no).

Table 3. Stepwise logistic regression models to predict underreport of drug consumption.

	Underreporting Cannabis			Underreporting Cocaine			Underreporting Benzodiazepines			Underreporting Heroi			Underreporting Methadone		
	OR	CI 95%	p	OR	CI 95%	p	OR	CI 95%	p	OR	CI 95%	p	OR	CI 95%	p
Marital status			0.048												
Newer married	1														
Married/widowed	0.23	0.05 - 0.99	0.04903												
Separated/divorced	1.61	0.79 - 3.29	0.19096												
Adressed by						0.041									
addiction outpatient clinic				1											
psychiatric outpatient clinic				1.23	0.34 - 4.42	0.747									
private practitionner				1.46	0.53 - .03	0.460									
social worker				5.34	1.65 - 17.31	0.005									
therapeutic community				0.53	0.06 - 4.89	0.580									
Other				2.51	0.70 - 9.03	0.159									
Seemed intoxicated				3.16	1.52 - 6.54	0.00198									
Current methadone substitution	1.83	1.05 - 3.18	0.03247	2.20	1.06 - 4.59	0.035									
Years of addiction				0.90	0.84 - 0.97	0.008				1.09	1.00 - 1.19	0.06041			
Programmed subsequent stay in a therapeutic community				0.35	0.17 - 0.736	0.006	0.47	0.25 - 0.90	0.022						
Positive predictive value	76.5%			85.9%			83.9%			76.8%			72.0%		

Other variables (and values) entered and retained in no model: Sex (male, female); Age range (<20, 21-30, 31-40, >41); Fatherhood/motherhood (yes, no); Arrived on schedule (yes/no); Previous institutional detoxification (No previous, In our withdrawal unit, In another institution)

previous detoxification experience in an institution influenced overreporting of opiates: Though a previous experience in the unit reduced the risk of overreporting heroin (although not significant compared to no previous institutional experience), a previous stay in the unit augmented the risk of overreporting methadone by 3 (p=0.001).

Table 3 reports the retained variables predicting underreporting. The marital status had the opposite effect on cannabis underreporting compared to overreporting. Being married/widowed reduced by a factor of 4 the risk of underreporting cannabis compared to having never been married (p<0.05), whereas the risk rose nonsignificantly when being divorced or separated. Also, a current methadone substitution at admission increased the odds of cannabis underreporting (p<0.05) and cocaine underreporting (p<0.05) by about a factor 2. Furthermore, the risk of being a cocaine underreporter was significantly (p<0.01) increased in patients who were referred to the unit by a social worker, compared to patients who were sent by the addiction outpatient clinic. A programmed transfer to therapeutic community immediately following to the withdrawal reduced the risk of underreporting cocaine by 3 (p<0.01), and the underreporting of benzodiazepines by 2 (p<0.05). Finally, with increasing duration of the addictive disorder the risk of underreporting cocaine decreased (p<0.01), whereas the risk increase of heroin underreporting was not statistically significant.

DISCUSSION

The objective of the present study was to test the assumption, that patients entering an inpatient detoxification center would present relatively high proportions of overreporting, and to explore factors which could increase the risk of overreporting and underreporting.

Despite the patients having being informed before hospitalization of the urine testing at the entry, the degree of validity of self reports in our study were found to be generally low when matched to urine tests, as confirmed by Cohens Kappa values between 0.25 and 0.4. Overreporting seemed to be especially prevalent with regard to the opiates (heroin and methadone), even relatively more frequent (59.9% for heroin, 40% for methadone) than underreporting (6.8% for heroin, 20.4% for methadone). On the other hand, underreporting was relatively more frequent than overreporting with regard to cocaine, benzodiazepines and cannabis. According to the social desirability theory [12], distortion of self-reports may occur as a function of the perceived acceptability of the behavior in question. As the tendency to underreport drug consumption seems logical in view of the stigma which is widely associated to drug use, the overreporting of opiates may appear as contra intuitive. One reason for this observation may be the that the detoxification unit is often seen by many local addiction professionals who address their patients to the unit to serve principally opiate withdrawal. Patients with a primary abuse of legal drugs (alcohol, benzodiazepines) are supposed to be referred to another inpatient unit of Lausanne. According to the social desirability theo-

ry this could indicate a tendency for the patients to report consumptions they think would fit best the patients preferred profile in the unit. An alternative (but not opposing) hypothesis could be that the patients tended to overreport because they feared withdrawal symptoms and hoped to have more treatment against withdrawal, especially more medicines.

Increasing age seemed to reduce the tendency to overreport benzodiazepines and increasing duration of the addiction reduced the risk to underreport heroin. These observations could be interpreted as an experience effect. Similarly, patients who had previously been hospitalized in the unit were less likely to overreport heroin consumption, suggesting that the previous experiences had been reassuring to them. Patients who had experienced previous detoxification treatments in the same unit may be less fearful with regard to the expected withdrawal symptoms and more confident in adequate treatment. This contrasts with the methadone overreporting among the patients with previous experiences in the unit. Whereas a "reassurance" effect for heroin and a "social desirability" effect for methadone cannot definitively be rejected, it seems unlikely that the patients would have such a strict distinction between prescribed and illegally acquired opiates, as reports of prescribed and nonprescribed methadone were merged into the same variable. The urine test itself not differentiating between the two types of consumption.

The effect of marital status on overreporting of cannabis and methadone is a puzzling phenomenon. While married and widowed patients seemed to have a statistically non significant tendency to overreport these two drugs, separated and divorced patients had a risk of overreporting more than twice as less than newer married subjects. Complementary to this, married patients with positive urine test were less likely to underreport. A rather speculative hypothesis could be that married patients are more inclined to rely on external support, i.e. present rather an external locus of control and would therefore be more likely to overreport in order to get more consideration from caregivers. For example, externality has previously been found to increase following divorce [15].

Patients who presented signs of intoxication at admission as recorded by the nurse had a tendency to overreport recent heroin consumption less likely and to significantly overreport methadone consumption more likely. Again, one could suppose an effect in the sense of social desirability, methadone consumption being possibly viewed by patients to be looked upon by staff as a more acceptable reason for an intoxicated state than heroin. While the observation of a tendency of reduced cannabis overreporting and an increased cannabis and cocaine underreporting among patients under methadone substitution supports the hypothesis, the increased risk of heroin overreporting among this subgroup of patients does not.

Cocaine overreporting was less likely in patients being referred by social workers, and on the other side the risk of underreporting was increased. At first sight, one could speculate that social workers and the setting in which they act is more prohibitive inducing the patient rather to veil their cocaine consumption

than to exaggerate it. As most of the addressing social workers were associates of regional addiction prevention agencies, which are rather known for their broadminded and supporting attitude, such an effect seems implausible.

The results of this study need to be viewed against the methodological limitations. The diverse drugs have different elimination metabolisms. Thus, the results of the analysis may have been influenced by several sources of downward and upward bias, depending on the substance half-life and the time laps between the consumption and the urine-test. For example, cannabis has a very slow elimination because of its liposolubility, while heroin eliminates comparatively faster. Still, the direct comparison of slow elimination drugs (cannabis vs methadone) and rapid elimination drugs (heroin vs cocaine) suggests that a bias due to different elimination rates could, at the most, moderately have been present.

Even if the patient's self-report accuracy had been encouraged by several precautions such as: 1) information concerning the urine analysis standard procedure, 2) the lack of incidence on further treatment, 3) the fact that self report did not necessitate an important recall ability (the questions concerning the drug consumption was only referring to the week before the unit entry), some factors have still influenced the patient's reporting accuracy.

In conclusion, patients entering an inpatient detoxification unit presented a rather large proportion of overreporting especially heroin and methadone, which, according to the social desirability theory. This would constitute an attempt to better correspond to the supposed preferred patient profile of the unit. Alternatively (or additionally) this could be an attempt to receive more consideration from the therapeutic team and to get more intensive pharmacological care. Most of the predictive factors retained by stepwise logistic regression confirm these hypotheses.

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