Indian J Physiol Pharmacol 2004; 48 (1) : 101–105

SELF-REPORTED DRUG USE AND URINALYSIS RESULTS

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(Received on February 21, 2003)

Abstract : The study examined the consistency between retrospective self-reported drug use and urinalysis data among 281 male opioid dependent subjects attending out patient clinic of National Drug Dependence Treatment Centre from January 2001 to December 2001 at All India Institute of Medical Sciences, New Delhi. Preliminary analysis indicated that there was moderate to high concordance between the two measures among different drug types. On an average 85% of urine test results matched with self-report. Subject's over-reported drug use as indicated by the low positive predictive value. In contrast, subjects were more accurate when they were reporting no drug use as suggested by the high negative predictive value. The study suggests that urine analysis is a critical variable in substance abuse treatment programs. Clinicians should be cautious while prescribing agonist drug due to frequent over-reporting of drug use by patients in our setting. This will make the substance abuse program more meaningful.

Key words : self report TLC GLC urine substance abuse opioid dependence

INTRODUCTION

The majority of drug research relies on self-reported retrospective information to define drug use behaviors. It is a principal measure in the evaluation of treatment outcome. There is usually a concern, however, that the self-reported drug use may be biased (1–8). Several factors like the pattern and type of drug use, type of measurement procedures, frequency or amount of drug intake, characteristic of the sample population, questionnaire construction, respondent's reporting errors, time elapsed since administration, medications, food and water consumption contribute towards these inconsistencies (6, 9). It is therefore necessary to establish the validity of self-report by an independent objective method (1–8). Currently urinalysis is a favored method for validating self-reported drug use in a clinical setting (7, 9, 10). Such urinalysis helps to diagnose, plan intervention

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and monitor progress following treatment and also provide an epidemiological instrument in studying patterns of drug abuse (11).

This study examined the consistency between self-reported drug use and urinalysis results among male opioid dependents seeking treatment at an outpatient clinic of National drug Dependence Treatment Centre.

METHODS

A total of 281 urine samples collected from male subjects attending the outpatient clinic of the National Drug Dependence Treatment Centre of All India Institute of Medical Sciences, New Delhi from January 2001 to December 2001. The data was collected during routine clinical care as and when the clinicians advised. Urine screening is routinely carried out for patients at periodic intervals by the clinicians to confirm self-report during treatment. The subjects were diagnosed as opioid dependence syndrome using ICD–10 DCR (12) criteria of substance use disorder by the psychiatrist and on their recommendations 50 ml of urine sample was collected from each patient under close supervision. Information was recorded by the psychiatrist on the nature of specimen to be tested, time of sample collection, brief clinical history of drug use, diagnosis, route of administration, quantity of consumption, last intake of drug in past 72 h and medicines prescribed on the urine testing requisition form. All the urine samples were analyzed in the laboratory of National Drug Dependence Treatment Centre. All the urine samples (10 ml each) were acid hydrolyzed. The solution were vortexed for 5 minutes and autoclaved at 120°C for 20 mins and 15 pka. After cooling, The PH of the solution was adjusted to PH 12 with 10 M sodium hydroxide and was extracted with 2 × 8 ml of chloroform-isopropanol (3:1). The organic layer was evaporated to dryness at 70°C under a stream of nitrogen. After, evaporation, the extracted reside was reconstituted with 20 µl methanol and 5 µl of residue was subjected to thin layer chromatography (TLC) for benzodiazepines using hexane-diethyl ether glacial acetic acid (80: 10: 10) as developing solvent (13). The aqueous hydrolysate was neutralized with 0.2 ml of concentrated hydrochloric acid and PH was adjusted to PH 9.5 with solid sodium bicarbonate buffer and extracted with 2 × 5 ml of chloroform - isopropanol (3:1). The organic phase was evaporated to dryness at 70°C and the residue was reconstituted to 20 µl methanol and 5 µl of residue was subjected to thin layer chromatography (TLC) for opioids using ethyl acetate-methanol-ammonia (85: 10: 5) as developing solvent and potassium iodoplatinate as a spraying reagent (14, 15). The sensitivity of TLC for each drug was 0.5 µg/ml. Further confirmation of the TLC urinalysis results was done by using Hewlett Packard 5890-series-II gas liquid chromatograph (GLC) equipped with a nitrogen phosphorus detector (NPD) and HP 3396 series-II integrator. The processed samples were injected on to the gas chromatograph silica capillary column (HP-1, 25 mx 0.2 mm i.d × 0.33 µm film thickness) in split mode. The identification of the compounds were based on retention time (14, 15). The sensitivity

of GLC for each drug was 0.01 µg/ml (14, 15). GLC results were used as a gold standard to confirm the patient self reported drug use in the present study. Descriptive statistics, positive and negative predictive values, diagnostic accuracy was calculated by using biomedical data processing BMDP statistical package version 7.0 (16).

RESULTS

The mean age of the subjects were 32 (S.D. ± 8.2), had low level of education, were from low socio-economic strata and were mostly employed. Even though these subjects were opioid dependent subjects, many of them were multiple drug users. Table I shows comparison between the results of urinalysis and self-reported drug use for morphine, buprenorphine, d-propoxyphene, and diazepam. Table II gives the diagnostic tests for self reports in comparison to urinalysis in past 72 hours. Analysis indicated there was moderate to high consistency between the two measures among different drug types. On an average 85% of urine test results matched with self-report. Taking urinalysis as the true measure of recent drug use, the positive predictive value, negative value and diagnostic accuracy of self-reports were assessed for each of the drugs. True positives in the sample ranged from 0.35%–13.5%. True negatives ranged from 62.9%–93.9%. Positive predictive value varied between 12.5%–55.5%. This indicates over-reporting of drug use. Negative predictive value ranged between 80.0%–96.0%. Diagnostic accuracy (congruence between self-report and urinalysis) for the drugs was moderate to high (76.5%–94.3%).

TABLE I: Comparisons of GLC urinalysis and self-report results for drugs.

Self-report result	*Negative*	*Positive*	*Total*
Morphine			
Negative	177	24	201
Positive	42	38	80
Total	219	62	281
Buprenorphine			
Negative	218	54	272
Positive	04	05	09
Total	222	59	281
D-Prpoxyphene			
Negative	251	25	276
Positive	04	01	05
Total	255	26	281
Diazepam			
Negative	264	09	273
Positive	07	01	08
Total	271	10	281

TABLE II: Diagnostic tests for self-report in comparison to GLC urinalysis in past 72 h (%).

Drugs	*True positives*	*True negatives*	*Positive predictive value*	*Negative predictive value*	*Diagnostic accuracy*
Morphine	13.5	62.9	47.5	88.0	76.5
Buprenorphine	1.77	77.5	55.5	80.0	79.3
d-prpoxyphene	0.35	89.3	20.0	90.0	94.0
Diazepam	0.35	93.0	12.5	96.0	94.3

DISCUSSION

The findings of the present study are credible because this study was conducted in well-established service delivery treatment setting where routine assessment and assay procedures are followed and patients are not self-selected for testing purposes. Hence the results are truly representative of the therapeutic setting. Many published reports in this area are likely to have been biased by such self-selection (5–8). Recent studies of treated and untreated populations using an improved urinalysis techniques indicate that the validity of respondent's self-reports of recent drug use may be considerably less than previously reported and may differ according to number of factors (6, 9). Among opioid dependent subjects concomitant drug use was observed in the current study. Many of these were psychotropic. Interestingly, the study replicated previous findings that in clinical practice, the concomitant use of non-opiate drugs must not be overlooked (16–18). The data indicate a moderate to high consistency between self-report and urinalysis results among different drug types. A major finding of this study is that subjects over-report drug use as indicated by the low positive predictive value. Over-reporting has been found in earlier studies also (10, 15, 19). Subjects may have over-reported their drug use in order to get more prescription medication because at our Centre, necessary medicines are dispensed free of cost to patients who cannot afford to purchase (18, 20). Hence, clinicians should be cautious while prescribing agonist drugs due to frequent over-reporting of drug use by patients, as many of the patients may not be really physiologically opioid dependent. It can also be assumed that another reason for the low positive predictive value could be because of the patients were under treatment and many of them had not recently used drugs as indicated by the low percentage of lab positive samples (3.6%–22.1%). This needs further examination. In contrast, subjects were likely to be more accurate when they were reporting no drug use as suggested by the high negative predictive value. Some of the limitations of the study are that the sample was drawn from a single treatment setting. The study results may not be generalized to other drug treatment populations. Urine test results could be confounded by some medications (especially with opiate use). Although the analyses revealed the rate of disagreement between self-report and urinalysis, adequate information was not available to study the underlying cause of the two measurements. This needs further prospective research in a clinical setting.

The study concludes that urine analysis is a critical variable in substance abuse treatment programs. Urinalysis remains of importance, as an adjunct to self-report, in providing information and in the treatment of drug addicts. It is recommended that all drug dependence treatment Centres should be equipped with a sensitive urinalysis facility. Further, this study suggests that clinical decision should determine the value and need for urinalysis from particular patients during treatment. Finally, a combination of these two approaches offer an excellent means of learning about the level and nature of drug use not only for clinical setting but also for the workplace, for surveys of general

population and for prevalence assessment purposes.

ACKNOWLEDGEMENTS

The author wishes to thank Dr. Rajat Ray Programme Incharge, National Drug Dependence Treatment Centre, All India Institute of Medical Sciences, for his encouragement. Thanks are also due to clinicians of the Centre for referring the patients for urinalysis and laboratory staff of the Centre for their technical assistance.

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