

Toxicological screening in heroin users: implications for management of drug misuse

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SUMMARY. *The toxicological screening of 200 urine samples from 55 known heroin users claiming to be abstinent revealed that in 18% of samples (24% of users tested) opiates were unexpectedly detected. Other substances, many of which were psychoactive drugs, were identified in 35% of samples. Cocaine was not detected in any samples. In addition, nicotine was found in 91% of users and caffeine in 44%. The data showed the presence of polydrug abuse in 29% of subjects and suggested there is an illegal supply of drugs originating from doctors' prescriptions. The requirement for more general use of toxicological screening and the implications of the results for management of drug takers in general practices are discussed.*

Introduction

THE role of the general practitioner in the management of problem drug takers is currently of great interest. Despite the reports of the Advisory Council on the Misuse of Drugs,^{1,2} which largely recommend drug dependency clinics as the main agency of management, more recent guidelines and reports recognize the inevitability of community-based management.^{3,4} The general practitioner, however, is hampered by the lack of reliable information about the behaviour of drug users, the quantities of drugs used and the frequency of administration;⁵ for example, much of our traditional view of drug users' lifestyle is at best exaggerated.⁶

The present study examines the results of toxicological screening of urine samples from known heroin users attending a general practice and discusses the implications of the results for the management of drug users in general practice. Information about the abuse of multiple drugs, some from prescriptions obtained from doctors is also presented. Multiple drug use is a recognized problem in drug abusers, having been implicated in some cases as the cause of death,⁷ and knowledge about the problem is of great importance in the management of drug users.

Method

Patients

The patients included in the study were known heroin abusers attending a group general practice in Edinburgh. Urine samples of 20 ml were routinely requested from individuals visiting the general practitioner and claiming abstinence from illegal heroin for greater than 48 hours. All drugs reported to be taken in the previous 48 hours and drugs which had been prescribed by the doctor were recorded and excluded from the study. The

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purpose and nature of the test was explained to the individual when the request was made. None of the patients refused the test but inability to pass a urine sample was an occasional problem. Under these circumstances the patient was asked to return the same day and provide the specimen.

The study group were drawn from a general practice population and were therefore receiving no specific treatment for their drug abuse. Many consultations were initiated for reasons other than drug related problems and the periods of abstinence claimed were variable in length and success. Other methods of validating self-reported abstinence were employed and are reported elsewhere.⁵

Tests were carried out on 200 urine samples from 55 individual drug users (40 male, 15 female, ratio 2.7:1) over a 21-month period (February 1985–November 1986).

Tests

Two urine screening procedures were employed by the laboratory. Every urine sample was analysed by Toxi-lab (Analytical Systems Inc.). This is a commercially available kit which employs thin layer chromatography to identify a wide range of drugs in urine, serum or gastric samples.^{8,9} The Toxi-lab system can be used to identify individual opiates, but is not the most sensitive test (limit of detection 4 mg of morphine per litre of urine) and preliminary hydrolysis of urine samples may be required to achieve the desired sensitivity.¹⁰ It may also be necessary to perform confirmatory tests and to repeat the chromatography procedure using alternative developing solutions to distinguish between morphine, dihydrocodeine and codeine.¹¹ After 65 samples had been screened, it became apparent that Toxi-lab might not be sufficiently sensitive to detect morphine in urine after single injection. A second test was used: Drug Test Opiates (Boehringer Biochemia Robin), a simple haemagglutination method for the detection of opiates.¹² It is sensitive (limit of detection of morphine 200 μ l⁻¹) but it has only limited specificity and cannot distinguish between morphine, codeine and dihydrocodeine; it also detects opioids, including methadone. The test was used first in urine from patients strongly suspected of recent heroin abuse, and subsequently in all urine samples as a preliminary screen (86 samples).

Results

The Drug Test Opiates analysis which identifies only the presence or absence of opiates and which was used in the general practice by the practitioner (J.R.R.) showed 21 positive results and 65 negative results (24% and 76% respectively).

The Toxi-lab test was carried out on all 200 urine samples, revealing a number of positive results. Of the 200 samples 19 (10%) were blood-stained, damaged or contained no detectable substances and 76 (38%) were found to contain only nicotine or caffeine or both. This left 105 urine samples which contained a total of 118 substances (including unidentified materials) from 37 drug users, 67% of all subjects. None of these drugs had been prescribed for the patient by his/her doctor and none had been reported by the subjects. More than one drug was detected for 29% of the drug users; 13 had two substances (excluding both nicotine and caffeine), three had three substances detected in their urine but none had four or more.

Opiates were detected in 36 samples (18% of 200 samples).

Table 1. Drugs detected in 200 samples of urine from 55 drug users claiming abstinence from heroin and other drugs.

Drug	Number of individuals (n = 55)	Number of samples (n = 200)
<i>Opiates (non-prescribed)</i>		
Dihydrocodeine	11	30
Morphine	5	6
<i>Benzodiazepines</i>		
Temazepam	4	7
Chlordiazepoxide	1	1
<i>Tricyclics</i>		
Nortriptyline	2	2
Amitriptyline	2	2
<i>Phenothiazines</i>		
Unspecified	3	3
<i>Stimulants</i>		
Amphetamine	4	4
Phenylpropanolamine	1	2
Ephedrine	1	1
Pseudoephedrine	1	1
Phentermine	1	1
Sympathomimetic amine	1	1
<i>Analgesics</i>		
Paracetamol	10	11
Codeine	2	3
Dextropropoxyphene	2	2
Mefenamic acid	1	2
<i>Antimicrobial</i>		
Erythromycin	1	1
Trimethoprim	3	4
<i>Unidentified materials</i>	24	34

n = total number of individuals or samples tested.

The opiates found were primarily dihydrocodeine (30 out of 36 samples) and morphine, a heroin metabolite (six out of 36 samples). These 36 positive samples came from 13 out of the 55 drug users, thus 24% of drug users were still abusing opiates while claiming abstinence. On a more positive note the subjects' self-reported abstinence was corroborated in 82% of the total urine samples taken.

Non-opiate drugs were detected in 69 samples (35%) from 35 individuals. Seventeen types of drug were found (Table 1) as well as a number of unidentified materials which may or may not be psychoactive materials. Cocaine was not found in any urine sample.

In addition to the above substances nicotine was found in combination with other substances in 158 samples from 50 individuals (91% of users) and caffeine along with other drugs in 37 samples from 24 subjects (44% of users).

Discussion

The value of toxicological screening is obvious and its availability to general practitioners has advantages for the management of patients who are abusing drugs. The difficulty in such consultations for general practitioners lies in knowing whether or not the account being presented represents the truth. Without some verification process, such as urine screening, mistakes are likely to be made in accepting a carefully conceived lie or in rejecting a genuine request for help. The results presented here showed that the expectation of a negative result for opiates was wrong on 18% of occasions (36 out of 200 samples) but that on the majority of occasions the patients were giving an accurate account of their abstinence.

Screening facilities have an additional advantage in stabilizing the doctor-patient relationship. The presence of this facili-

ty, even when used only intermittently, makes the patient realize that any deception may be detected. The failure to produce a sample for analysis was often interpreted by the doctor as an indication that it was likely to be positive and the increased care taken by persistent drug users to attend appointments in a non-intoxicated state leads to additional improvements in managing problem drug users in the general practice setting.

The presence of a number of other substances in the patients' urine, demonstrated by the non-opiate drug results, is a useful indication of which drugs are locally available. On occasions, the identification of an unusual psychoactive substance, such as phentermine or amphetamine, can explain a problem in clinical management, for example the failure of a drug user to be symptom-free, or may indeed account for many of the protracted sensations attributed to the opiate withdrawal syndrome. In particular, a high consumption of nicotine, benzodiazepines and caffeine during withdrawal may aggravate the subjective feelings of illness. The wide variety of drugs taken by heroin users has consistently been reported to increase the likelihood of lethal overdoses.⁷

The availability of prescribed drugs on the illegal market is well established, but local prescribing patterns may improve or exacerbate this situation. In particular, the continued presence of dipipanone on the illegal market and the emergence of buprenorphine, both of which are injected and in the latter case also inhaled, suggest that efforts should be made to curb the prescribing of these drugs. It was unfortunate that these analytic procedures were unable to detect diazepam and buprenorphine in urine, both of which are known to have a high resale value in the local drug using community (diazepam 10–20 pence per 10 mg tablet; buprenorphine £2.50–£3.50 per tablet). The latter is excreted in the bile and is therefore not detected in urine, and the former is metabolized and excreted as glucuronide conjugates, which are not detected by the Toxi-lab system.

The presence of human immunodeficiency virus (HIV) infection in the study group necessitates care in the handling of samples, both in the surgery and laboratory.¹³ With adequate observation of guidelines for handling specimens contaminated with hepatitis B and/or HIV virus, including the heating of specimens for about one hour at 56°C before analysis, risks are minimal.

Changing patterns of illegal drug taking are important clinically as well as in influencing prescribing policy and legal control. Increased observation of these changes can only be facilitated by improved toxicological testing and increased awareness of the value of such information. In addition to improving the general practitioner's understanding of the behaviour of his or her patients, toxicological screening facilities make the management of problem drug takers easier and more likely to be successful.

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