SHORT REPORT

A snapshot of workplace drug testing in the UK

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Background There is a growing trend towards workplace drug testing in the UK, but there is little published data associated with this work.

Aim This survey reviews our findings from workplace drug testing in comparison with the results obtained from routine illicit drug monitoring.

Methods The results of the analysis of 1617 specimens from 82 workplace drug testing sources and 12,281 submitted from drug dependency units were collated and compared.

Results Workplace specimens were found to be positive for amphetamines, benzodiazepines, cannabis, cocaine and heroin.

Conclusions The data presented here suggest that a regular monitoring is required to discern the true extent of drug use in the workplace, especially in safety critical areas.

Key words Gas chromatography–mass spectrometry; illicit drug use; immunoassay screening; workplace drug testing.

Introduction

The release of the Federal guidelines in 1988 [1] resulted in random workplace drug testing becoming more commonplace [2] and in 1995 drug abuse was estimated to cost American industry approximately $100 billion per year [3,4]. However, in 2001, a review found that the workplace policies in Europe had little provision for drug testing, or endorsed the use of near patient testing devices without chain of custody or confirmation [5]. It was at that time that the United Kingdom Workplace Drug Testing Forum finalized its guidelines for legally defensible workplace drug testing [6], followed by the European Workplace Drug Testing Society guidance [7]. As per the US experience, the release of these guidelines resulted in workplace drug testing becoming an increasing aspect of the workload of analytical laboratories in the UK.

Beyond the assumption that cannabis is likely to be the most common drug detected, the findings of a UK-based workplace drug testing service have never been published. It was, therefore, decided to review our results from January to December 2002 to illustrate both the type and the frequency of drugs detected. In addition, the results obtained, following the routine monitoring for illicit drug use in individuals attending drug dependency units over the same 12-month period, were collated to elucidate any differences between the drug use habits of the two groups of subjects.

Methods

Between 1 January and 31 December 2002, a total of 1617 urine specimens were submitted for workplace drug testing from 82 sources. Over the same period, 12,281 specimens were received from drug dependency units, clinics and general practitioners requesting routine analysis for illicit drugs.

All specimens were initially screened for illicit drugs using an automated immunoassay technique, followed by confirmation using gas chromatography–mass spectrometry (GC–MS) according to the UK Guidelines [6] as necessary. This analytical approach was used to detect the presence of amphetamines, benzodiazepines, cannabinoids, cocaine, methadone and opiates. The presence of specific opiate drugs (codeine, dihydrocodeine and morphine) together with the specific heroin metabolite (6-monoacetylmorphine) was also detected by GC–MS.
The most common drug detected from workplace drug testing was cannabis (188 samples), followed by opiates (48 samples) and benzodiazepines (25 samples). It was also found that 18 samples were positive for cocaine, six for amphetamines and seven for heroin (detected as 6-monoacetylmorphine). In addition, morphine, codeine and dihydrocodeine were confirmed to be present in approximately 1% of the workplace samples analysed (see Table 1).

The demographic data supplied with the workplace specimens facilitated the following comparisons to be made:

(1) Samples originated primarily from male subjects (1453 samples, 89.9% of the population studied) compared with 164 samples from female subjects (10.1% of the population studied).

(2) Drug positive samples originated predominantly from male subjects (284 samples) compared with only 24 drug positive samples from females. However, this equates to a similar drug positive rate of 19.5% for male subjects and 14.6% for female subjects.

(3) Analysis of variance found that there were no significant differences ($P > 0.1$) between the age ranges of the drug positive male group (16–60 years) and the drug positive female group (range 20–52 years). Similarly, there were no significant differences ($P > 0.1$) between the ages of the male and the female drug positive groups for any drug detected.

(4) Of the total 308 positive samples, only nine positive results could be explained by declared prescription medication (see Table 1).

The classes and frequency of drugs detected in the specimens that originated from the drug dependency units reflected the typical findings associated with chaotic drug users undergoing treatment. Of the 12 281 specimens analysed, opiates were present in 5506 (44.8%), with the heroin metabolite being present in 2651 specimens (36.4%). Similarly, it can be seen that there were high positive rates for cannabis, benzodiazepines, cocaine and amphetamines at 36.4, 31.1, 22.0 and 3.5% of specimens, respectively.

### Results

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### Table 1. The number of samples found to be positive for each drug studied, divided into sex and age range of the individuals monitored following workplace drug testing. The positive detection rate for illicit drug use in those attending drug dependency units is included for comparison

<table>
<thead>
<tr>
<th>Drug detected in the samples analysed</th>
<th>Males</th>
<th>Females</th>
<th>Total number</th>
<th>Total number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive</td>
<td>Age (years)</td>
<td>Positive</td>
<td>Age (years)</td>
</tr>
<tr>
<td>Amphetamines</td>
<td>6</td>
<td>22–58</td>
<td>0</td>
<td>–</td>
</tr>
<tr>
<td>Benzodiazepines</td>
<td>23</td>
<td>29–53</td>
<td>2</td>
<td>37–43</td>
</tr>
<tr>
<td>Cannabinoids</td>
<td>175</td>
<td>16–60</td>
<td>13</td>
<td>20–43</td>
</tr>
<tr>
<td>Cocaine</td>
<td>17</td>
<td>25–44</td>
<td>1</td>
<td>36</td>
</tr>
<tr>
<td>Methadone</td>
<td>21</td>
<td>24–53</td>
<td>2</td>
<td>42–43</td>
</tr>
<tr>
<td>Opiates</td>
<td>42</td>
<td>16–54</td>
<td>6</td>
<td>28–52</td>
</tr>
<tr>
<td>Codeine</td>
<td>12</td>
<td>20–54</td>
<td>2</td>
<td>31–51</td>
</tr>
<tr>
<td>Dihydrocodeine</td>
<td>16</td>
<td>21–52</td>
<td>2</td>
<td>29–52</td>
</tr>
<tr>
<td>Morphine</td>
<td>16</td>
<td>16–48</td>
<td>2</td>
<td>28–31</td>
</tr>
<tr>
<td>6-Monoacetylmorphine$^d$</td>
<td>6</td>
<td>28–40</td>
<td>1</td>
<td>43</td>
</tr>
</tbody>
</table>

$^a$Three samples contained amphetamine and three contained ‘ecstasy’ (methylenedioxymethamphetamine).

$^b$Of the 25 positive workplace samples, only three samples originated from individuals prescribed benzodiazepines.

$^c$Of the 18 positive workplace samples, only six samples originated from individuals prescribed dihydrocodeine.

$^d$6-Monoacetylmorphine is a specific metabolite of heroin; its presence is indicative of recent heroin use.

### Discussion

This study found that a significant number of workplace specimens (19% of those analysed) were positive for illicit drug use, including amphetamine, cocaine and heroin. The detection of these classes of drugs indicates their recent use and includes individuals were either caught due to the random nature of specimen collection, following ‘for cause’ testing after an incident at work or were simply unable to refrain from illicit drug use prior to monitoring.

It has been suggested that the estimated rate of illicit drug use is around eight times the positive test rate and that random screening will only detect regular (near
daily) users [2]. Bearing in mind that these drugs are rapidly eliminated from the system, more frequent testing of employees may be required to develop a true picture of the extent of illicit drug use in the workplace.

The fact that cannabis was the most commonly encountered drug detected in workplace samples (11.6% positive rate) may be explained in part because of its known physicochemical properties. The high confirmation rate for cannabis (36.4% positive rate) in those specimens analysed from drug dependency units could also be explained in part by its long elimination profile, but may additionally reflect its widespread use. The results of the analysis of the specimens from the drug dependency units, however, show that opiates are still the most frequently abused drugs, with 44.8% of specimens tested positive for an opiate. The high positive rate for methadone metabolite (43.0%) is primarily due to its use as the current preferred treatment for opiate addiction, although it is also known to be an abused drug.

This snapshot survey was based on 1617 samples received from 82 sources in 2002. In the previous year, <300 samples were received for workplace drug testing, which supports the view that UK workplace drug testing is now becoming more widespread. Despite this apparent growth in testing, the practice may still be seen as controversial [8]. This is partly due to the ethical aspects of specimen collection, but primarily due to the serious consequences of false positive results [9]. It is for this reason that guidelines for legally defensible workplace drug testing were developed [6,7] to be implemented throughout Europe.

The efficiency and cost-effectiveness of workplace drug testing has been questioned [8], even though it has been found that pre-employment screening could result in huge savings for large organizations [3]. However, it has also been found that companies with drug testing programmes have experienced a significant decrease in accident rates [10] and that more frequent testing could reduce the chance of accidents occurring further [8].

In summary, the data collated from this study illustrate that all classes of abused drugs were detected following workplace drug testing. This indicates the need for a continuous and effective monitoring of employees, especially in safety-critical work areas.

References