CAUSES OF FALSE POSITIVE REPORTS FOR DRUGS OF ABUSE IN URINE

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(on behalf of the UKNEQAS Steering Committee for Drug Assays*)

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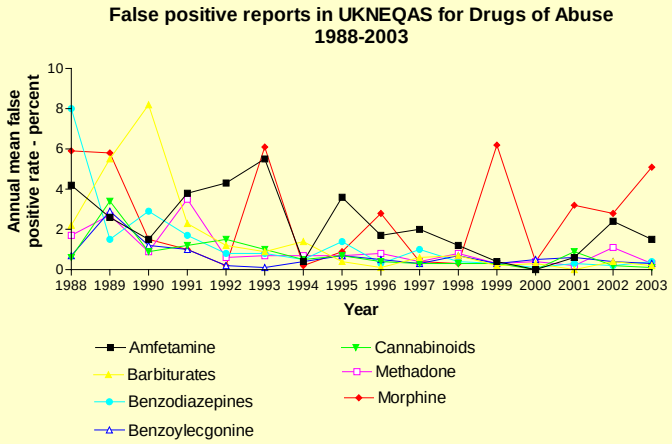
INTRODUCTION

Analyses used to detect drugs of abuse in urine are configured to minimize the number of false positive results at the expense of increases in false negative results because of the potential imposition of sanctions following a false positive report be it in a clinical, workplace or penal setting.

Despite improvements and technological advances in both immunoassay and chromatographic procedures used for drug analysis, the number of false positive reports made by participants in the United Kingdom National External Quality Assessment Scheme (UKNEQAS) for drugs of abuse in urine has remained relatively constant for more than 10 years.



METHODS

The cause of all false positive reports made by participants in the UKNEQAS for drugs of abuse in urine was investigated for the 21 samples distributed by the scheme between February 2003 and August 2004. From the 196 to 203 laboratories that reported on each sample, 119 laboratories were requested to report, by means of a questionnaire, the cause of a total of 268 false positive reports. The questionnaire requested that the laboratory describe the suspected cause(s) of the false positive report and to categorize the cause as being the result of analytical or non-analytical errors, or due to an error of interpretation.

RESULTS

A total of 203 (76%) responses were received.

Table 1. Classification by laboratories of the cause of their false positive reports (n = 203)

analytical errors	68 (33%)
non-analytical errors	59 (29%)
errors of interpretation	50 (25%)
combination of errors	5 (2%)
not classified	21 (10%)

Table 2. Reported causes of false positive reports. (data are number of reports, total = 199)

Non-analytical errors	
transcription errors	37
laboratory computer input/output error	8
samples switched	10
data entry error by EQA scheme	1
Immunoassay errors	
cross-reactivity with related compounds	10
cross-reacting metabolite reported as parent	13
unexplained positive results	5
difficult to read NPT device	6
Chromatographic analysis errors	
inter-conversion of compounds during acid hydrolysis, derivatisation or on-column	20
mis-identification of TLC spots	15
compounds with similar retention times/UV spectra	13
compounds with similar mass spectra/transitions	10
MS library look-up error & library omissions	5
MS identification of unexpected compound	4
Others	
calibration errors in quantitative integrity tests	13
reporting of unconfirmed results	4
reporting of below-threshold (trace) concentrations	10
carry-over between samples	7
contamination during storage/reconstitution/work up	5
standard read by instrument instead of sample	1
bubble in sample cup or inexperienced analyst	2

DISCUSSION

A number of participants with transcription errors noted that patient data are transmitted electronically. In cases of analytical error, several laboratories reported that procedures had been adapted to prevent recurrence of the error.

*Membership of UKNEQAS steering committee for drug assays

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