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Current status of accreditation for drug testing in hair

Society of Hair Testing
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Abstract

At the annual meeting of the Society of Hair Testing in Vadstena, Sweden in 2006, a committee was appointed to address the issue of guidelines for hair testing and to assess the current status of accreditation amongst laboratories offering drug testing in hair.

A short questionnaire was circulated amongst the membership and interested parties. Fifty-two responses were received from hair testing laboratories providing details on the amount and type of hair tests they offered and the status of accreditation within their facilities.

Although the vast majority of laboratories follow current guidelines (83%), only nine laboratories were accredited to ISO/IEC 17025 for hair testing. A significant number of laboratories reporting that they were in the process of developing quality systems with a view to accrediting their methods within 2–3 years. This study provides an insight into the status of accreditation in hair testing laboratories and supports the need for guidelines to encourage best practice.

Keywords: Hair testing; Laboratory accreditation; ISO/IEC 17025

1. Introduction

Drug testing laboratories worldwide recognise the importance of implementing quality systems to ensure the effective control of the testing services they provide. Laboratories are accredited or certified to both national and international (ISO/IEC 17025) standards with guidelines readily available for urine workplace drug testing [1,2] and doping control in sport [3].

Questions relating to the accuracy or reliability of test results are frequently asked during cross-examination in court or by customers assessing the suitability of a laboratory service. The international quality standard ISO/IEC 17025, documents the criteria for testing laboratories wishing to demonstrate their technical competence in generating valid test results [4].

National accreditation bodies are responsible for evaluating analytical testing laboratories for compliance to the ISO/IEC 17025 standard including assessment of laboratory documentation, proficiency testing, measurement traceability, personnel competence, and measurement uncertainty calculations.

Accrediting methods for the analysis of drugs in hair represents a significant challenge to the analyst with respect to the lack of certified reference material, limited guidelines on best practice and reservations on the efficacy of hair testing. The Society of Hair Testing (www.soht.org) recognises the importance of addressing these issues and has published recommendations for good practice in hair testing [5] and conducts yearly proficiency tests [6–11].

In order to gain an insight into current practices within laboratories offering hair testing, the Society of Hair Testing (SoHT) circulated a short questionnaire on the subject of laboratory accreditation to its members and individual laboratories with an interest in hair testing.

To ensure a consistent approach to the analysis of drugs in hair and the accreditation process, the SoHT aims to work with its membership to reach a consensus on best practice in hair testing and publish guidelines to be used by both laboratories and national accreditation bodies.

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2. Materials and methods

The questionnaire was designed in two parts: to gain an insight into the scale of hair testing offered by laboratories and to provide more detailed information on the prevalence of quality assurance procedures within the field of drug testing in hair.

In the interests of confidentiality, the names of the laboratories taking part were not disclosed. Each response was given a unique identifier and information from the questionnaires was collated and stored on Microsoft Excel spreadsheets ensuring anonymity. General background questions asked for details on the country where the laboratory is based, the number of hair samples tested each year, the types of testing offered and what proportion all of the testing carried out within the laboratory involved hair testing.

Specific questions were asked in relation to quality assurance; does the laboratory follow guidelines on hair testing, the extent of their laboratory accreditation and finally details of any plans to implement accreditation or extend the current scope.

3. Results and discussion

A total of 59 completed questionnaires were received, 7 from laboratories who at present do not offer hair testing services. Five of the seven laboratories were accredited to ISO/IEC 17025 and although they were excluded from this initial study there input will be sought for future studies.

The remaining 52 laboratories offering hair testing were selected for analysis. The country of origin of the laboratories that responded to the questionnaire is summarised in Table 1. The vast majority of responses were received from European countries with only five laboratories (10%) responding from North America.

A high proportion of the responses were received from laboratories based in Italy. This is most likely a result of the number of laboratories participating in the HAIRVEQ external quality control program, which is actively involved with improving the standard of hair testing in Italy [7]. In 2002, the Istituto Superiore di Sanità of Rome (ISS), in cooperation with the Institut Municipal d'Investigació Mèdica of Barcelona initiated HAIRVEQ to evaluate the performance of laboratories offering hair testing within the Italian Health System and Institutes of Forensic Medicine. In the latest round in 2006 [12], a total of 32 laboratories participated and although there were a number of false positive and false negative results reported, overall there has been a marked improvement in the quality of hair testing since the introduction of the HAIRVEQ program.

Table 1
Questionnaires returned by Country

Country	*N*
Austria	1
Canada	1
Finland	1
Luxembourg	1
Sweden	1
Spain	1
France	2
Greece	2
Poland	2
Belgium	3
Switzerland	3
USA	4
UK	6
Germany	9
Italy	15

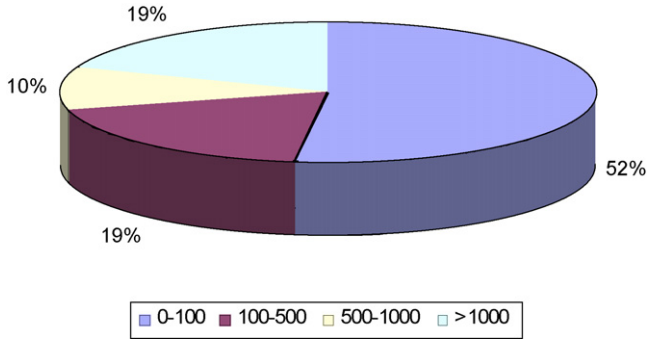

Fig. 1. Number of hair samples tested annually.

Laboratories were asked to estimate, on average, the number of hair samples they tested each year and what proportion of all the samples they tested were hair samples. The results are summarised in Fig. 1 and Table 2, respectively. The vast majority of laboratories tested less than 500 samples each year with over half of all laboratories testing as little as 100 or less hair samples per year. Ten (19%) laboratories reported testing greater than 1000 samples annually with eight of the laboratories based in Europe.

Hair, as an alternative matrix, has historically been offered as an additional specialist test by laboratories already providing routine tests for medico-legal purposes and this is certainly the profile of the laboratories in this study. Forty-one (80%) laboratories reported that the number of hair samples analysed each year represented 25% or less of all the samples they tested. Four laboratories provide hair testing exclusively. The effort required to achieve accreditation can put considerable strain on resources [13] and for laboratories testing less than 100 hair samples per year, this is understandably not an area of priority.

The advantage of hair analysis is its ability to provide historical detail of an individuals' exposure to drugs following chronic use [14,15] or a single exposure [16,17]. To better understand the variety of hair testing offered, laboratories were asked to indicate the types of hair testing they carried out from the following categories: criminal investigations, workplace drug testing, monitoring of drug use, research and driving licence renewal. The findings are summarised in Table 3. Eighty-seven percentages of the laboratories offered testing in two or more categories most commonly criminal investigations (drug-related deaths, child protection) and monitoring drug use with 36 (69%) research active laboratories. Driving licence

Table 2
Proportion of samples tested within laboratories is hair samples

% of hair testing	*N*
0–25	41
>25–50	3
>50	5
100	2