Available online at www.sciencedirect.com
ScienceDirect
Forensic Science International: Genetics Supplement Series 1 (2008) 680–681
www.elsevier.com/locate/FSIGSS

Research article

Results of the 2007 Paternity Testing Workshop of the English Speaking Working Group of the International Society for Forensic Genetics

C. Hallenberg *, R.B. Langkjær, P.B. Jensen, B.T. Simonsen, N. Morling

Section of Forensic Genetics, Department of Forensic Medicine, University of Copenhagen, Frederik V's Vej 11, DK-2100 Copenhagen Ø, Denmark

Received 27 August 2007; accepted 29 August 2007

Abstract

We present the results of the 2007 Paternity Testing Workshop of the English Speaking Working Group of the International Society for Forensic Genetics. The exercise included paternity testing of blood samples from a mother, a child and an alleged father. The laboratories were encouraged to answer questions concerning their laboratory routines and a paper challenge was distributed in order to compare statistical calculations. A total of 69 laboratories participated. The laboratories used a total of 41 autosomal STRs and PCR-investigated VNTRs, 22 Y-chromosomal STRs, 11 X-chromosomal STRs and 7 VNTR systems investigated with RFLP. The rate of typing and reporting errors was 0.2%.

Keywords: Paternity testing; DNA profiling; Collaborative exercise; Proficiency testing; STR; VNTR

1. Introduction

Since 1991, The English Speaking Working Group (ESWG) of the International Society for Forensic Genetics (ISFG) has offered an annual exercise involving genetic analysis of a paternity case [1–4]. The collated results of the exercises include typing results and information about laboratory routines, systems and kits used for paternity testing as well as information about statistical calculations. Since the year 2000, the laboratories have been invited to calculate a paper challenge in addition to the paternity testing.

2. Materials and methods

Blood samples from a mother, a child and an alleged father were sent to the laboratories. In addition, a paper challenge was distributed. In the paper challenge, three children and a woman had been investigated. The woman was assumed to be the mother of Child C. Child D and Child E were assumed to be full siblings. The laboratories were asked to consider the hypothesis that the biological father of Child D and Child E was father of Child C versus unrelated. Results from 15 autosomal and 11 Y-chromosomal STRs and the number of observations of the relevant alleles/haplotypes in a database of Danish people were given.

The laboratories submitted results and answered questions concerning laboratory routines into an online database. A total of 69 laboratories participated in the workshop.

3. Results

In the paternity testing exercise, all laboratories concluded that the results were in favour of paternity. The combined PI-value ranged from approximately 5000 to more than 10^{15}. Results from a total of 41 autosomal STRs/PCR-investigated VNTRs, 22 Y-chromosomal STRs, 11 X-chromosomal STRs and 7 VNTR systems investigated with RFLP were submitted. Of these, results from 32 autosomal STRs, 16 Y-chromosomal STRs, 8 X-chromosomal STRs and 4 VNTR systems investigated with RFLP were submitted by more than one laboratory.

The percentage of typing and reporting errors of the submitted results was 0.2%.

A total of 80% of the laboratories stated that they routinely use computer software for statistical calculations and 21% stated that they use more than one programme. Of those who use computer software, 91% stated that they only use software validated by the supplier and/or by the laboratory.

* Corresponding author.
E-mail address: charlotte.hallenberg@forensic.ku.dk (C. Hallenberg).

1875-1768/$ – see front matter
doi:10.1016/j.fsigss.2007.08.007

In the paper challenge, laboratories were encouraged to give information about the formulas used for calculation. A total of 28 laboratories submitting formulas of the calculations. For each of the investigated systems, 21–79% of the laboratories used the same formula for calculation. A total of 24 different combined PI-values were submitted. In one system, a possible silent allele was present. Among 25 laboratories submitting formulas from this system, a total of 15 different formulas were submitted. If the system was ignored, the number of different residual PI-values submitted were reduced to 17, and 43% of the laboratories submitted the same residual PI-value. A total of 71% of the laboratories concluded that the results were in favour of Child C having the same father as Child D and Child E while 18% concluded that the results were inconclusive.

4. Discussion

Participation in proficiency testing has gained more interest as more laboratories have become accredited. The number of participating laboratories in the Paternity Testing Workshop of the ESWG has increased from only nine in the beginning in 1991 up to 69 this year.

In 2007, an error rate in the typing results of 0.2% was observed. This error rate has been fairly constant during the years. Today most errors are due to reporting errors rather than errors in typing.

Most laboratories use computer programs for calculation. Even so, the paper challenge shows a large variation in routines and formulas used for biostatistical calculations. Most of this variation is due to different handling of rare events. If rare events such as possible silent alleles are not present, more than 40% of the laboratories get the same result of the calculations.

Conflict of interest

None.

References

[1] D. Syndercombe Court, P. Lincoln, in: A. Carracedo, B. Brinkmann, W. Bär (Eds.),A review of the 1991–1994 Paternity Testing Workshops of the English Speaking Working Group, Adv. Forensic Haemogenet. 6 (1996) 683–685.

[2] A. Bjerre, D. Syndercombe Court, P. Lincoln, N. Morling, A report of the 1995 and 1996 Paternity Testing Workshops of the English Speaking Working Group of the International Society of Forensic Haemogenetics, Forensic Sci. Int. 90 (1/2) (1997) 41–55.

[3] C. Hallenberg, N. Morling, A report of the 1997, 1998 and 1999 Paternity Testing Workshops of the English Speaking Working Group of the International Society of Forensic Genetics, Forensic Sci. Int. 116 (1) (2001) 23–33.

[4] C. Hallenberg, N. Morling, A report of the 2000 and 2001 Paternity Testing Workshops of the English Speaking Working Group of the International Society of Forensic Genetics, Forensic Sci. Int. 129 (1) (2002) 43–50.