Colombian results of the interlaboratory quality control exercise 2015

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ARTICLE INFO

Keywords:
Quality control exercise
Colombia
Latin America
Genes SAS

ABSTRACT

Currently, all agencies of conformity assessment testing laboratory favor the participation in proficiency testing as a mechanism for quality assurance. In Colombia, the Genes Laboratory has been designated, since 2008, to perform, design and implement proficiency testing for all the interested laboratories. In this report, the results of Colombian exercise Interlaboratory Quality Control for the year 2015 are presented. The exercise consisted of one practical component, one theoretical mandatory component, and an optional theoretical component. Twenty laboratories participated, representing six different countries of Latin America and the Caribbean. For the practical component each participant laboratory received; (1) samples of blood, saliva, and semen stains, in this part they should report the routine own laboratory markers for each sample, (2) three optional theoretical cases of varying complexity, (3) a mandatory theoretical approach about a biological relationship of paternal grandparents – granddaughter case. In the last two components of the exercise, they had to submit only the calculations. For the practical component the consensus of 70 STR markers, distributed between autosomal and linked to the sex chromosomes, was achieved with an error rate of 0.80% in genotyping, 1.0% nomenclature and/or format discrepancies and 3.8% non-reporting. On the other hand, 99.4% of the reported values were correct, only two values were not correct (0.6%) but were within the range of 5% of the correct value, being acceptable values within the rules of the exercise. This inter-laboratory exercise has become an important mechanism for quality assurance and ongoing training in the region.

1. Introduction

The practical work of laboratories that perform paternity tests can be evaluated using Interlaboratory comparisons, which are extensively used. Looking for an improvement in the quality of the results, these exercises are very useful for the laboratories, and the public itself which can relay in the quality of the essays.

Colombian Reference National Laboratory, GENES SAS, had organized and coordinated since 2008 the Quality Control Exercise for laboratories undertaking paternity, maternity and forensic tests with DNA markers. In 2015 Laboratories from Colombia, Brazil, Ecuador, Peru, Dominican Republic, and Chile participated in the exercise. In this report, the results of Colombian Exercise Inter-Laboratory Quality Control for the year 2015 are presented.

2. Materials and methods

The laboratories received an invitation containing conditions, value and registration form for the exercise. Subsequently, we sent the samples for the enrolled laboratories, the results form and the instructions to make and report the results of exercise. In 2015, the exercise consisted in one practical component, one theoretical mandatory component and a theoretical optional component. For the practical component, each participant laboratory received; (1) samples of blood, saliva, and semen stains, in this part they should report the routine own laboratory markers for each sample, (2) three optional theoretical cases of varying complexity, (3) a mandatory theoretical approach about a biological relationship of paternal grandparents – granddaughter case. In the last two components of the exercise, they had to submit only the calculations. Consensus was established with a minimum of three (3) laboratories with the same genotyping for each marker, therefore the result must match 70% of the laboratories that send results to a marker. For analysis of the results were taken into account the findings from previous years [1–3] and the recommendations of both the ISFG [4] and the GHEP-ISFG [5].
3. Results and discussion

In the exercise Colombia Inter-Laboratories of the year 2015 participated 20 laboratories. For the practical component, the consensus of 70 STR markers, distributed between autosomal and linked to the sex chromosomes, was achieved (Table 1). The error was of 0.80% in genotyping, 1.0% of nomenclature and/or format discrepancies and 3.8% non-reporting. On the other hand, 99.4% of the reported values were correct, only two values were not correct (0.6%) but were within the range of 5% of the correct value, being acceptable values within the rules of the exercise. This inter-laboratory exercise has become an important mechanism for quality assurance and ongoing training in the region, with various countries participating (Fig. 1).

4. Conclusion

The Proficiency Test conducted through the Colombian National Reference Laboratory has become a useful tool for quality assurance of all Colombian laboratories and some of Latin America that perform DNA testing to establish biological relationships. It is presented as an excellent opportunity for ongoing training of experts from the region and a way to achieve high quality results from all the laboratories.

Conflict of interest

None.

Table 1
List of STRs markers under consensus.

<table>
<thead>
<tr>
<th>STR</th>
<th>MARKERS UNDER CONSENSUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autosomal</td>
<td>Ameleogenina CSF1PO F13A01 F13B FES/FP FGA LPL TH01 TPOX VWA ACTBP2(SE33) D1S1656</td>
</tr>
<tr>
<td>Y chromosome</td>
<td>DYS 19 DYS 385 DYS 389 I DYS 389 II DYS 390 DYS 391 DYS 392 DYS 393 DYS 437 DYS 438 DYS 439 DYS 448</td>
</tr>
<tr>
<td>Y chromosome</td>
<td>DYS 643 DYS 456 DYS 458 DYS 460 DYS 461 DYS 635 GATA A10 GATA H4 DYS 576 DYS 481 DYS 549 DYS 533 DYS 570</td>
</tr>
<tr>
<td>X chromosome</td>
<td>HPRTB DXS8387 DXS7423 DXS7132 DXS10103 DXS10134 DXS10074 DXS10101 DXS10135 DXS10146 DXS10079 DXS10148</td>
</tr>
</tbody>
</table>

Fig. 1. Countries with laboratories participating of the exercise in green. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)
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