Correspondence

The AICEF/GITAD: Latin American Academy of Criminalistics and Forensic Studies

Sir:

The term "Iberoamerica" is often used in science and research to convey collaboration or association between Latin America and the two European countries Spain and Portugal, that predominately contributed to the language and culture of Latin America. Iberoamerica (from now on, IA) is therefore comprised of 23 countries with a total population over 500 million people. Two of these countries are Portuguese-speaking (Portugal and Brazil), and the other 21 countries are Spanish-speaking. Among the IA countries there are those with large populations, with federal political organizations (i.e., Brazil and Mexico), and others with smaller population sizes, such as the six countries that form Central America (i.e., Honduras, El Salvador, Guatemala, Nicaragua, Costa Rica, and Panama).

There are also important historical, socio-political anthropological and cultural differences among the IA countries. However, because of the common history since the XVI century due to the influence of Spain and Portugal, there are also common ties, even though the geographic distance is great, for example, between the Chilean Antarctic areas and the northern deserts of the Mexican New California. The fact is that the common language (Spanish and Portuguese are substantially similar and thus comprehendible) is a tool that facilitates the communication, understanding and cooperation among IA. This basis is the foundation for creation of the AICEF.

It is very difficult to describe, country by country, the organization of the forensic sciences. These differences make it difficult to establish a similar structure. The problem is exacerbated by peculiarities dependent on the political organization of some countries. In many countries around the world, forensic sciences and crime investigation have oversight from the State or Government, through the Ministeries (or equivalents) of the Interior (Internal Affairs, Home Office), and of Justice (Dept. of State). There are also National or Regional Institutes of Legal Medicine provided authority or mission from different Ministries or serve as a part of the Attorney's General Office. Also, Universities (usually public or State ones) sometimes play an important role by educating forensic professionals and/or by carrying out legal autopsies or toxicological analyses. Also, in some countries there exist mechanisms for private laboratories or companies to provide services, and obviously forensic experts that might legally play an important role in the forensic arena. The fact is as recent as 2000 the forensic structure in the different IA countries is notably different from one to another.

GITAD (Grupo Iberoamericano de Trabajo para el Análisis del DNA; Iberoamerican Working Group on DNA Analysis) was the original group of AICEF, and it was created to attempt to coordinate the efforts of all the forensic DNA typing laboratories of IA. The goal is to facilitate communication of technical knowledge and experiences and to help improve quality assurance and quality control programs.

The GITAD was founded in October 1998, during the Ninth International Symposium of Human Identification, held in Orlando, Florida. This first meeting was attended by representatives from 11 different IA countries (Argentina, Brazil, Chile, Colombia, Costa Rica, El Salvador, Mexico, Puerto Rico, Uruguay, Venezuela, and Spain). The help and support from Promega Corporation (Madison, WI) was welcomed and greatly appreciated.

A second GITAD meeting was held in Belo Horizonte, Brazil, in concert with the Second Latin American Symposium on Human Identification. At this meeting, the AICEF (Academia Iberoamericana de Criminalística y Estudios Forenses = Iberoamerican Academy of Criminalistics and Forensic Studies) was formally established. Different sections comprise the AICEF; these sections are Forensic and Legal Medicine, Toxicology, Crime Scene Investigation, Dactiloscopy, Ballistic & Graphology, Law, Anthropology, Odontology, Bioethics and the GITAD which is now the Forensic Genetic and Biology Section of AICEF.

By October 1999, all IA countries are represented in the AICEF/GITAD, regardless of the police/forensic structure of the country, the type of genetic techniques currently used or any other criteria. Official GITAD/AICEF members must be members of a Laboratory belonging to a public or Government institution, i.e., Ministry of Justice, State Police Departments, Federal Law EPolice, Attorney's Office, Institute of Legal Medicine.

A survey was conducted to determine the status of DNA laboratories in the area. A number of conclusions could be made regarding the need for collaboration and cooperation among all Latin American countries. For instance, most Latin American forensic laboratories are small in size and have few personnel (typically fewer than eight people). On a positive side, most laboratories contain highly qualified personnel who have Ph.D. university degrees and who run the laboratory. This is an optimistic situation. Although there have been limited international relationships, highly-educated personnel are in place—a prerequisite for high quality.

Another interesting observation is that most GITAD laboratories almost exclusively deal with criminal casework and only paternity analyses when required as part of a judicial investigation. Also to be noted are the differences in techniques used not only among the different countries, but also inside the same country. Some of the differences are such that the sharing of DNA profile data is not possible. This data incompatibility can be counterproductive, especially because investigative budgets are limited regarding DNA analysis.

Because of the experience of the different members and because of the need to develop common guidelines, within a single year the AICEF/GITAD has made a number of decisions to meet its desired goal of communication and data sharing.

A set of six short tandem repeat loci have been chosen as common core set among the IA countries, in order to facilitate interchange of data and compatibility for future common databases or criminal collaboration. The GITAD six core loci are CSF1PO, TPOX, TH01, D7S820, D13S317, and D16S539. These loci were selected because: (a) they can be analyzed either by silver-staining

or fluorescent-based detection techniques. Currently, less than 20% of the labs in Latin America can use fluorescent detection methods; (b) they are well defined and reagents for analysis can be purchased from commercial companies to ensure compatibility and quality; (c) they have relatively high PDs and PEs; and (d) they are CODIS-compatible. GITAD recommends the use of these six STR loci in order to build databases that can be compatible among different countries. The use of these six STR loci does not preclude the use of additional loci. Each laboratory must use the number of loci necessary to achieve the desired PD or PE in a paternity case (i.e., in paternity, to reach a PI>1.000, it is usually necessary to use more than 6 loci).

Different working groups of the GITAD have been established. These are: (a) Quality assurance and quality control; (b) forensic statistics; (c) evidence collection and preservation; and (d) comparative legislation. The working groups are each developing common/similar guidelines for all countries, regardless of specific requirements due to national laws. The first document on "Recommendations for QA/QC Procedures in Forensic Genetic Laboratories" has been approved as of Sept. 2000, and it is available through our web site. Hard copies will also be distributed to all laboratory members and are available, free of charge, upon request to the GITAD President. By June 2001 all other working groups will release guidelines and recommendations.

An initial QC analysis was run in Autum 1999, including typing of four unknown dried bloodstains (spotted on cotton) for at least the six core STR loci (i.e., an open blind test). Results were received and processed, showing compatibility and reliability of the participating laboratories (data not shown). Pooling all data, up to 17 different loci were analyzed using both silver staining (85% of participating laboratories) and fluorescent-based techniques (15%).

A third AICEF/GITAD meeting was held in Montevideo, Uruguay (Feb. 16–18, 2000) and a number of major issues were addressed. These include: (a) potentially increasing the number of core STR loci for the IA database compatibility from the six first recommended to the same 13 loci in CODIS; (b) establishing minimum requirements regarding QA/QC procedures in Forensic DNA laboratories; (c) advocating minimum criteria for statistical calculations in final reports; and (d) including recommendations for legislators to ensure and facilitate international cooperation.

With such an active program, the AICEF is trying to ensure that the IA will have a prominent role in the 21st century in the forensic sciences. Although such efforts are laborious and time consuming, the AICEF/GITAD believes that the benefits of such endeavors are more than worthwhile.

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Misinterpretation of a Urinary 6-Monoacetyl Morphine Concentration

Sir:

This laboratory was recently involved in the investigation of a multiple-fatality vehicular homicide case. We feel that an opinion presented by an expert for the defense was seriously flawed. We thought that the opinion, and its underlying basis, might be of interest to others in the field.

The driver in the case was known to local police, and was suspected both of causing the accident, and of being "significantly impaired" by heroin at the time. The driver was injured in the crash, and received emergency medical care, including analgesia in the form of morphine. Hospital testing of a urine sample indicated the presence of opiates.

We were contacted by the County Prosecutor to determine if testing was available that could establish if the driver had indeed used heroin, and was impaired at the time of the accident (the Prosecutor recognized the potentially confounding presence of morphine).

We suggested that given the circumstances of the case, analysis of the urine sample for 6-monoacetyl morphine (6-MAM) might confirm use of heroin. We emphasized that detection of 6-MAM in a urine sample would not provide evidence of impairment at the time of the accident, merely confirmation that heroin had been used at some time prior to the collection of the sample. With this understanding, the prosecution requested that our laboratory perform the analysis; 0.267 mg/L 6-MAM in the urine sample was detected by GCMS using standard methods.

Prior to trial, we received a copy of an opinion provided to the defense by a reputable expert, which included the (unreferenced) statement "Literature reports indicate that 6-monoacetylmorphine is present in urine in 64% to 73% of all heroin users studied, averaging approximately 0.8 mg/L, and ranging up to 10 mg/L. Consequently, if 0.267 mg/L was accurately detected in (the subject's) urine, the detected concentration is relatively low compared to literature values, indicating a probable prolonged period of time between (the) last heroin use and collection of the urine sample."

The potential for significant error in a quantitative inference derived from a urine value is well recognized in the forensic community, and needs no further comment. We were, however, interested in the basis for the "average value" of ~0.8 mg/L, and the source thereof. Our experience with 6-MAM suggested that the 0.267 mg/L was a relatively high number.

It appears that the source of information used by the expert for the defense was a recent edition of "Baselt" (1) which, under the section "Heroin," contained the following statement: "6-acetylmorphine is present in urine in 64% to 73% of all heroin users studied, averaging approximately 0.8 mg/L, and ranging up to 10 mg/L (Fehn & Megges, 1985; Derks et al., 1986)."

A review of the studies cited revealed that of the 47 urine samples collected from heroin users, and evaluated by Fehn and Megges (2), 6-MAM was detected in 24 cases. 6-MAM levels in 22 of those cases were less than 0.55 mg/L. One result of 8.0 mg/L and one of 10.0 mg/L were included in the data set, without comment. Interestingly, while the mean of the complete data set was 0.864 mg/L, the authors make no mention of this value in the article, (presumably recognizing its inherent lack of statistical reliability in their specific experiment). The 22 values with 6-MAM concentrations less than 0.550 mg/L comprise a markedly skewed, non-gaussian data set, for which the mean value (0.124 mg/L) is neither characteristic, nor of predictive value (SD = 0.156 mg/L). Because the study was not controlled for dose, or time post exposure, a "mean" value for the concentration of a metabolic intermediate such as 6-MAM is inherently meaningless. Indeed, in the absence of time and dose parametric constraints, the best description for the mean value is that it approaches 0 as a limit.

The key point, of course, is that the Fehn and Megges study was a methodology report, intended only to demonstrate the capability and reliability of detection of 6-MAM in urine samples. Because of the experimental design, the data do not provide a legitimate basis