

APPLICATION OF THE *M-FISys*® PROGRAM:

SERIAL RAPE

Rape and sexual assault are offences under the Act, of which there are few studies on serial sex offenders. In Guatemala, cases of sexual rapists have been detected by the combination of testimonial and scientific evidence. The implementation of new technologies has made it possible to detect new patterns of serial rapists, such as the Mass Fatality Identification System (*M-FISys*®) program.

The application of this program, the different variables it handles as such and the analyses carried out by the genetics laboratory of the National Institute of Forensic Sciences of Guatemala, allowed the determination of two groups of serial rapists in the departments of Chimaltenango and Quiché.

Rape and sexual assault are offences under the Law Against Sexual Violence, Exploitation and Trafficking in Persons within the framework of "sexual violence". Rape is defined as: "Who, with physical or psychological violence, has carnal access vaginally, anally or buccally with another person, or introduces any part of the body or objects, by any of the indicated channels, or forces another person to introduce them to himself ..." (Verbatim copy).

Sexual assault is defined as "Anyone who with physical or psychological violence performs acts for sexual or erotic purposes on another person, the aggressor or himself as long as it does not constitute a crime of rape..." (Verbatim copy).

According to statistics reported by INACIF, from 2008 to September 2014, 31,832 clinical evaluations related to crimes of sexual violence have been carried out (Graph No.1). However, the number of cases that are not reported to the Public Prosecutor's Office is unknown and therefore a clinical evaluation is not generated.

It is known that most sexual crimes occur within the family or in the environment close to the victim, and a low percentage of these cases have been committed by aggressors outside the victim, where the motivations of the aggressors are based on psychological stimulations.

A study conducted by Lisak and Miller in 2002, showed that many sex offenders have a strong psychological motivation fueled by their victims' desires for control and domination, found that sex offenders tend to commit sexual assault repeatedly, including those who were under psychological treatment.

In Latin America there are few studies on serial sex offenders; in Costa Rica between 1998 and 1999 the presence of a serial rapist was detected, who after his capture indicated that after having carried out the first rape of a woman, his desires and feelings for committing this type of acts increased.

In Guatemala, the first rapist and serial killer identified was José María Miculax Bux, alias "Miculax", author of more than fourteen rapes and murders of male children, was sentenced to death and executed in 1946. Recently other cases have been known such as the case of Tránsito Enrique López Pérez, sentenced to 200 years in prison for the rape of about eleven women and the famous case of the rapists of the Roosevelt Causeway, in which Javier González González was sentenced to 106 years in prison for his participation in the rape of around seven women.

This article reflects the application of bioinformatics technology and DNA analysis for the identification of new patterns in cases of serial rapists, comparing genetic profiles of various cases.

Among the most recent bioinformatics programs in the field of forensic genetics worldwide is the Mass Fatality Identification System, M-FISys® program, which is an important tool in the INACIF Genetics Laboratory since 2011. This program was designed by the genecodes forensics corporation, Inc., after the terrorist attacks of September 11, 2001 in New York, United States of America.

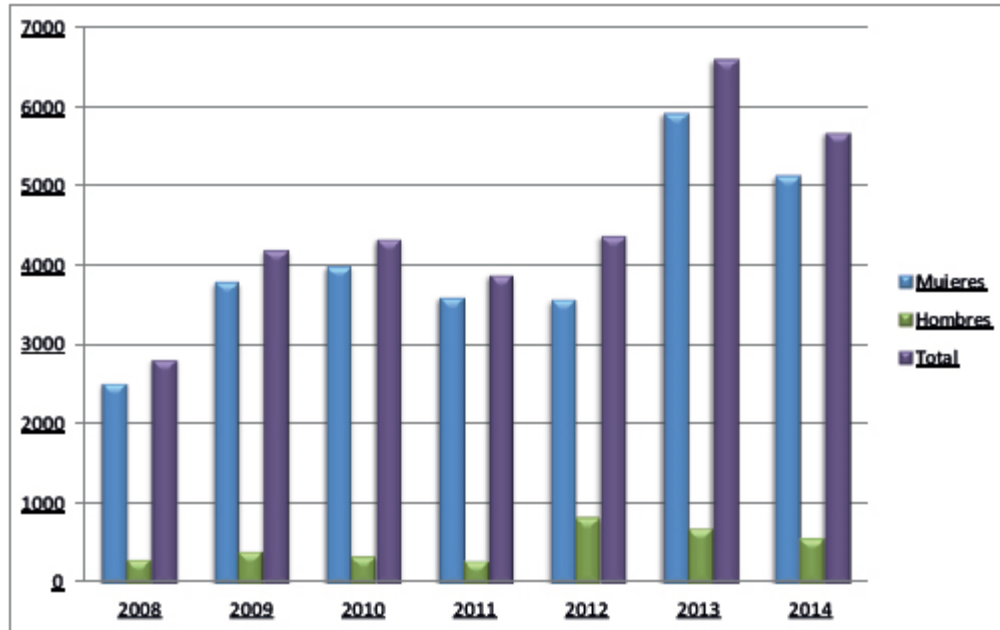
This tool was designed with the aim of improving the process of identifying victims in mass disasters by automatically comparing a large number of genetic profiles of reference samples of relatives with samples of missing persons for their identification. However, his ability to compare genetic profiles is also very useful in the field of criminalistics, where a comparison of a large number of genetic profiles becomes humanly impossible.

PROCEDURES AND METHODS

Within the M-FISys program® there are the following databases:

Criminalistics: groups the genetic profiles obtained in cases where DNA transfer occurs, for example rapes, homicides, among others.

Gráfica No. 1
Evaluaciones clínicas por agresión sexual en el INACIF
desde el año 2008 hasta agosto del año 2014



Fuente: Laboratorio de Genética -INACIF-

Identification: groups genetic profiles in cases where it is intended to make comparisons between people not identified by other non-genetic means and their respective relatives. **PROKIDS:** groups the genetic profiles in the cases of missing minors and cases of human trafficking framed within the international DNA PROKIDS program. **Filiations:** groups all genetic profiles related to civil and criminal paternity cases. When searching for matches in the criminalistics database, the M-FISys® program groups the matching genetic profiles into a cluster in which the information concerning the samples that compose it is detailed. The procedure consisted of importing the genetic profiles of the transfer cases from 2011 to the Criminalistics database within the M-FISys® program. Subsequently, a match review was carried out in which two different conglomerates that had a common male genetic profile were identified. This allowed the results to show two groups of sex rapists, which are explained below. After having determined the coincidences, we proceeded to review the files and expert opinions of the genetic analyses involved to corroborate the coincidences.

RESULTS AND DISCUSSION

Two groups of matches were determined within the Criminalistics database which are detailed below.

GRUPO 1

Composed primarily by the coincidence of an unknown male genetic profile in 13 different indications taken from seven victims, of which six were previously associated in the same case. The M-FISys® program helped identify victim 7 within the same group of cases, thus constituting a new coincidence.

Table No. 1 and graph No. 2 below describe the details obtained through genetic analysis associated with the group of victims within this group of coincidences.

Tabla No. 1
Resultados de Análisis Genéticos

Víctima	Hisopado vaginal	Hisopado anal	Prendas de vestir	Otros Indicios	Individuos detectados
1	Individuo C	NR	Individuo C	Individuo C	1
2	Individuo C	NR	Individuo C	Individuo E	2
3	Individuo C y B	NR	NR		2
4	Individuo C y G	Individuo C	NR		2
5	Individuo C y B	NR	Individuo C y B		2
6	Individuo C y D	NR	Individuo C y D		2
7	NR	NR	Individuo C		3

NR: No Realizado

Fuente: Laboratorio de Genética -INACIF-

Nota: Individuos B, C, D, E y G identificados en Dictámenes Periciales relacionados

Gráfica No. 2
Comparación de cantidad de individuos participantes en los hechos según expediente y resultados de análisis genéticos



Fuente: Laboratorio de Genética -INACIF-

Table No. 1 shows that the genetic profile of five different individuals was obtained, of which individual C was the profile identified by the M-FISys program® as a coincidence.

After reviewing the files, it was corroborated that the genetic profile of individual C was present in the evidence of all the victims related to the group. Additionally, by genetic analysis, four other individuals were detected in indications of some victims in this group.

However, according to the record and as can be seen in graph No. 2, the number of individuals participating in the event does not agree with the genetic findings. This suggests that some of these individuals probably did not participate during the rape of the victims or left no traces of detectable genetic material.

GRUPO 2

Composed by the coincidence of an unknown male genetic profile in 11 indications taken from five victims, of which four were previously associated within the same case. The M-FISys® program helped identify victim 5 within the same group of cases, thus constituting a new match.

Table No. 2 and graph No. 3 describe below, the details obtained through genetic analysis associated with the group of victims within this group of coincidences.

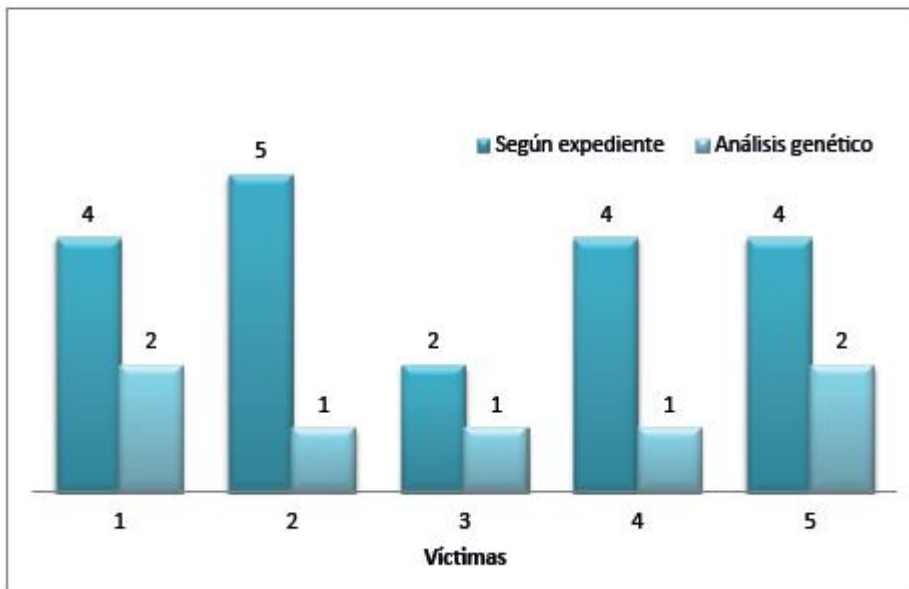
Tabla No. 2
Resultados de Análisis Genéticos

Víctima	Hisopado vaginal	Hisopado anal	Prendas de vestir	Individuos detectados
1	Individuo 1	NR	Individuo 1	2*
2	Individuo 1	NR	Individuo 1	1
3	Individuo 1	NR	NR	1
4	Individuo 1	Individuo 1	NR	1
5	Individuo 1	NR	Individuo 2	2

NR: No Realizado.

*Se detectó un segundo individuo, el cual no fue individualizado debido a la presencia de un perfil genético mezcla.

Gráfica No. 3
Comparación de cantidad de individuos participantes en los hechos según expediente y resultados de análisis genéticos



In the table above it can be seen that the genetic profile of three different individuals was obtained, of which individual 1 was the profile identified by the M-FISys program® as a coincidence.

After reviewing the files, it was corroborated that the genetic profile of individual 1 was present in the evidence of all the victims related to the group. Through genetic analysis, two other individuals were detected in indications of some victims in this group.

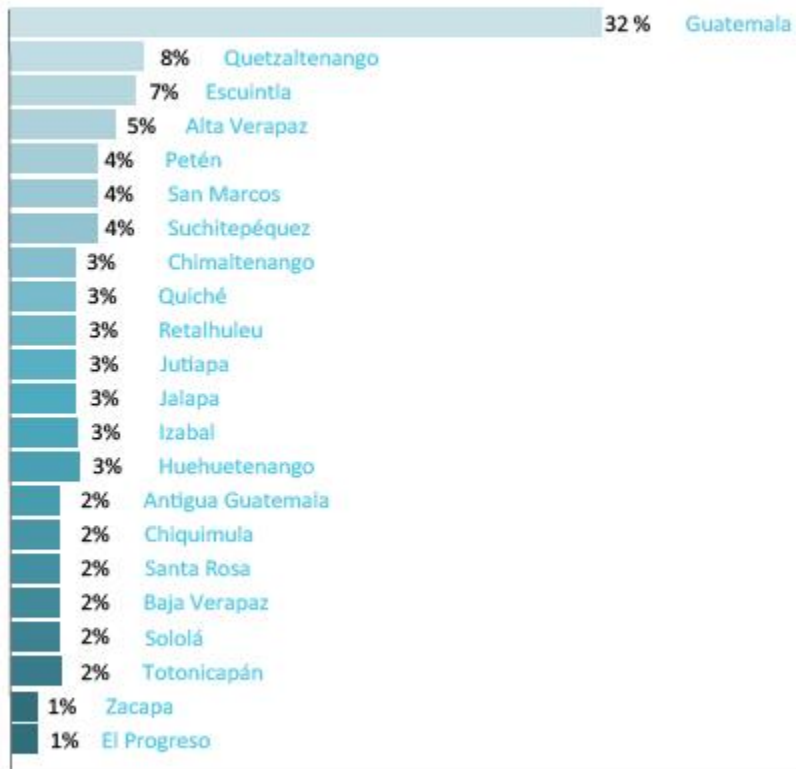
However, according to the file and as can be seen in graph No. 3, the number of individuals participating in the event does not agree with the genetic findings, so some of these individuals probably did not participate during the rape of the victims or did not leave traces of detectable genetic material.

In this group of cases, it is observed that individual 1 is primarily the sexual aggressor of about five individuals who participate in the events, according to the file.

It is important to note that both groups of coincidences were detected in the departments of Chimaltenango and Quiché respectively.

According to figure No. 3, both departments present a total of 3% of the clinical evaluations for sexual crimes carried out by INACIF from 2008 to September 2014. These data are consistent with what was reported by the Survivors Foundation until 2011, which considers these departments as places with low recurrence in cases of sexual crimes.

Porcentaje de evaluaciones clínicas por agresión sexual por departamento realizadas por el INACIF
Período: del 2008 a septiembre del 2014



Fuente: Laboratorio de Genética -INACIF-

It should be borne in mind that this article only describes the information associated with the group of matches detected by the M-FISys program® of the cases analyzed by the Genetics Laboratory with a request by the competent authority. There are probably more victims associated with the serial sexual assaults described, considering both the cases not analyzed by the laboratory, and the underreporting of cases.

CONCLUSIONS

1. The Criminalistics database within the M-FISys® program is an important tool in identifying serial rape groups because it simplifies the determination and identification of matching genetic profiles.
2. Two serial rapists identified as individual C and individual 1 were determined through the use of the M-FISys® program.
3. The operation of two groups of serial rapists (group 1 and 2) was identified in the departments of Chimaltenango and Quiché where the presence of this type of group had been reported, and with low percentages of sexual crimes.

4. Group 1 was formed by the coincidence of a male genetic profile -individual C- identified in 13 indications taken from 7 victims.
5. Group 2 was formed by the coincidence of a male genetic profile -individual 1- identified in 11 indications taken from 5 victims.

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