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Family reunification through DNA analysis of survivors of the greatest natural disaster in Colombia in Armero-tolima (1985)

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ABSTRACT

On November 13, 1985 at 9:20 p.m., the Nevado del Ruiz Volcano erupted (A Glacier Snowy Volcano 17457 fts above sea level). The lahar, melting ice and landslide devastated the town of Armero located 45 kilometers away in a matter of minutes, in the Tolima department of Colombia. More than 25,000 people died or were reported missing. This tragedy is the largest natural disaster to date in Colombia. The Armando Armero Foundation is a Non-Governmental Organization (NGO) that brings together survivors of this tragedy. This NGO is making efforts to reunite families in association with Servicios Médicos Yunis Turbay y Cia. Different strategies are used to search and find matches in our database, including documents and records, autosomic STR, Y chromosome STR and mtDNA analysis. Thus far, four families have been reunited in this process.

1. Introduction

On November 13, 1985 at 9:20 p.m., the Nevado del Ruiz Volcano erupted (A Glacier Snowy Volcano 17457 fts above sea level). The lahar, melting ice and landslide devastated the town of Armero located 45 kilometers away in a matter of minutes, in the Tolima department of Colombia. More than 25,000 people died or were reported missing. This tragedy is the largest natural disaster to date in Colombia [1].

TV footage from news channels from that time, evidenced that many children were rescued alive and were given in adoption in 1985–1986 by the Instituto Colombiano de Bienestar Familiar (ICBF) without their parents' or Family consent to families in the USA and Europe. However, the government does not have information of their whereabouts. The Colombian justice system exonerated the Colombian Government from compensating the victims' families for moral and material damages.

The Armando Armero Foundation is a Non-Governmental Organization (NGO) that brings together survivors of this tragedy. This NGO is making efforts to reunite families in association with our Institute, by carrying out free autosomal STR DNA tests, Y Chromosome STR and mitochondrial DNA studies to reunite families. Several campaigns in TV programs, web portals and social media pages in Europe and the USA had been presented to find adopted Colombian children from that period

of time that could be survivors of Armero's tragedy.

Different strategies are used to search and find matches in our database. A personal interview is carried out with each individual in order to determine possible family relationships and to gather as much information as possible. In some instances, the Armando Armero foundation has carried out additional research to find documents, and possible links among individuals. Thus, in some cases, oriented searches had been carried out and in other cases, each individual is matched against the entire database.

2. Materials and methods

2.1. Autosomic STR

A total of 266 samples have been collected with prior informed consent. Of these samples, 41 samples correspond to individuals that were given up in adoption following the disaster. The remaining samples correspond to individuals and family members looking to find their lost children or relatives. They have been typed for Powerplex 23 (Promega Corporation) or by GlobalFiler (Thermo Fisher Scientific) following manufacturer's recommendations, and analyzed in ABI 3500 or ABI 3130 XLS genetic analyzers. Genetic profiles are then uploaded into our

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database for search and match.

79 Y Chromosome STR samples have been analyzed using Powerplex Y23 or Yfiler Plus kits following manufacturer's recommendations.

2.2. mtDNA analysis

mtDNA have been carried out in selected cases or HV1 and HV2 regions, or for HV1, HV2 and HV3 control regions using standardized protocols and DNA sanger sequencing using BigDye Terminator 3.1 cycle sequencing (Thermo Fisher Scientific) and analyzed in a 3500 genetic analyzer using SeqScape v2.7 software. The revised CRS is used as reference following ISFG recommendations and guidelines for haplotype and nomenclature [2].

All DNA testing has been carried out in our 17025:2015 accredited laboratory for Autosomal, Y Chromosome and mtDNA analysis.

3. Results

Thus far, we have reunited 4 Armero's adopted children with their relatives through DNA testing, using autosomal and uniparental markers. We continue collecting samples to reunite as many families as we can.

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