



A CASE STUDY – DNA PROFILING OPENED A DOOR TO SOLVE SPINE CHILLING HUMAN SACRIFICE.

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ABSTRACT

The introduction of DNA analysis for human identification is helpful in legal medicine. Recovery of DNA from bone samples exposed to adverse environmental conditions for prolonged periods has significant application in identification of human remains. The information received from DNA profiling serves as the only tool for identification. In the instant case registered in Police station, 7 year old girl went missing while returning from school seven months ago. During investigation, some bones were found in nearby jungle, some in pit of bathroom and some in field. Polymerase chain reaction based STR DNA profiling proved the girl's identity who had been sacrificed by her family members to prevent 'some bad omen'. Though, the girl's parents turned hostile, prosecution relied on DNA profiling report which proved the girl's identity and on the basis of DNA report and statements of other witnesses, seven persons were sentenced to death penalty by the court.

KEYWORDS : DNA, DNA profiling, Polymerase chain reaction, STR.

Introduction:- DNA profiling has become an invaluable tool for the identification of human remains. Relevant efforts have been continuously made to identify human remains after wars, mass disasters^(1,2,3,4,5). In addition to these cases, there has been increase in collection of biological samples from exhumed human remains, mainly for genetic investigations of paternity in civil processes^(6,7). The detection of DNA polymorphism has been a powerful tool in identification tests. It was first used in forensic casework investigation by Alec Jeffereys in 1985⁽⁸⁾. The development of the technology for obtaining DNA polymorphism and their validation studies has been very rapid. But some factors reduce the power of these tests. In dead body, DNA degrades very quickly. A rapid bacterial growth decomposes corpses in short period especially in tropical areas⁽⁹⁾. Other common problem is presence of inhibitors of DNA analysis^(9,10).

Due to the degradation of genetic material in cadavers, it is challenging to get high molecular weight DNA which can be analyzed. Agents like microorganisms, humidity and many organic compounds to which corpses were exposed, also reduce the amount of informative DNA. Because of this, bones have been shown to be very useful as they can be preserved for long time.

In the instant case a mother had lodged a complaint to police station that her 7 years old girl went missing from village while returning from school. During investigation, after 7 months, police got information about presence of human bones in shrubs of jungle. From the first sight, skull, bones and clothes were identified by the mother. During interrogation of the family members, the spine chilling incidence came out. The girl's grandmother broke down and narrated the gory incidence that how her neighbor had a dream in which Goddess appeared and demanded human sacrifice of a youngest girl in the household. So, the grandmother along with family members slit the throat of the girl, offered her to Goddess and then drank her blood as blessing. Then they buried her body parts, few in pit of bathroom, few in field and remaining thrown in jungle.

To confirm the identity of the girl, police forwarded the bones from all the three places along with reference blood samples of parents to

Regional Forensic Science Laboratory, Nagpur, Maharashtra, India. DNA profiles obtained from bones matched with parents which prove her identity.

Materials and Methods:-

Bone pieces
Reference blood samples
AmpFISTR Identifier Kit (Applied Biosystems)
Lysis buffer
Isopropanol
TE Buffer
HiDi Formamide
Liz Size standard

Treatment of Bone prior to DNA Extraction:-

Bone pieces were sterilized by washing with 0.5% Sodium Hypochlorite and then rinsed with running deionized distilled water for 5 min. Bones were air dried and powdered using grinding jar set of Tissue lyzer.

DNA Extraction:-

Approximately 1 gm of bone powder was taken in 2.0 ml tube. Lysis buffer (10 mM Tris HCl, pH 8.0, 10 mM NaCl, 2% SDS, 39 mM DTT) and 200 mg/ml Proteinase K enzyme were added and mixed well. Solution was incubated in waterbath at 37°C for overnight. Next day, DNA was extracted using Phenol Chloroform Isoamyl alcohol according to standard protocol. DNA was concentrated using CentriconTM-100 column (Millipore Corp).

PCR Based STR Genotyping:-

Extracted DNA from bone pieces were amplified using AmpFISTR Identifier Kit with the help of PCR Machine to amplify DNA⁽¹¹⁾. Reaction mixture used for PCR were - PCR Reaction Mixture (10.5 µl), Primer set (5.5 µl), Taq Gold DNA Polymerase (0.5 µl) and Sample (10 µl). DNA amplified in 28 cycles using PCR Machine. Amplified products were separated and detected using 3130 Genetic Analyzer⁽¹²⁾. Simultaneous amplification of 15 STR Loci and gender specific Amelogenin Locus was completed and analyzed^(13,14).

Table 1: Typing of 15 STR Loci and Gender specific amelogenin locus.

STR LOCUS	GENOTYPE					
	Blood of Mother	Pieces of Bone From Jungle	Piece of bone From pit of bathroom	Piece of bone From pit of bathroom	Pieces of bone From field	Blood of Father
D8S1179	10,16	15,16	15,16	15,16	15,16	14,15
D21S11	29,30,2	29,29	29,29	29,29	29,29	29,31
D7S820	9,12	8,9	8,9	8,9	8,9	8,8
CSF1PO	11,12	10,11	10,11	10,11	10,11	10,11
D3S1358	15,15	15,17	15,17	15,17	15,17	16,17
TH01	6,9	6,9	6,9	6,9	6,9	9,9
D13S317	11,14	10,11	10,11	10,11	10,11	10,11
D16S539	9,11	11,12	11,12	11,12	11,12	11,12
D2S1338	23,23	19,23	19,23	19,23	19,23	19,21
D19S433	12,15,2	15,2,17.	15,2,17.2	15,2,17.2	15,2,17.2	13,17,2
vWA	19,19	19,19	19,19	19,19	19,19	18,19
TPOX	11,11	8,11	8,11	8,11	8,11	8,8
D18S51	13,15	13,15	13,15	13,15	13,15	10,13
AMELOG ENIN	X,X	X,X	X,X	X,X	X,X	X,Y
D5S818	12,12	10,12	10,12	10,12	10,12	10,11
FGA	22,23	23,23	23,23	23,23	23,23	23,27

Results and Discussions:- The DNA extracted from bone pieces collected from different places and reference blood samples of mother and father of a girl was typed at 15 STR Loci and Gender specific Amelogenin Locus using PCR amplification technique. (Table 1)

DNA profiles obtained from pieces of bones collected from three different places were found to be identical and from one and the same source of female origin and for all the 15 different genetic systems, father and mother matched obligate paternal and maternal alleles respectively (Table 1).

Conclusion:-

From the analysis, the decomposed bones were found to be of the missing girl. After DNA test, police arrested seven persons on the charge of human sacrifice and court sent them to police custody for a week. Being her family, all of them along with the parents of deceased girl became hostile. It was only the DNA test, on the basis of which court awarded capital punishment to all the seven under section 302 (Murder) of Indian Penal Code and also imposed fine of Rs 5000/- to each of them.

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