

EXPLORING DNA TECHNIQUE IN CRIME INVESTIGATION IN THE BACKGROUND OF OTHER SCIENTIFIC METHODS

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Abstract

One of the most significant inventions and development in the history of the human race is forensic science. Without having knowledge of forensic science, there would be a great effect on the society as well as the judicial system. At contemporary era forensic science plays a very vital role in solving the crime problem. It provides the best opportunities to the judicial system for solving the crime and in detection the criminal.

Even though the forensic science is being not so new discipline, not many people are aware about it. In old time due to absence of technological development, it was never felt by the judicial system that forensic science techniques needed to be apply because the old methods were taking into consideration for committing the crime. Approximately before two thousand year the crimes were solved on the behalf of debate and argument made by the parties. On the behalf of the argument and debate made by the parties, the public held the power to decide whose arguments are legit. The old techniques of crime detection and solving the crime problem were sufficient to the criminal justice system. But by the passage of the time new techniques emerge due to vast technological development and the criminal became aware towards the use of these technologies in the commission of crime. The accused persons were getting the benefit of the technological development. Now a day it became very easy to be safe from any criminal liability. It was the great challenge before the court to find out the crime and to punish the accused by applying the old techniques. The accused person was taking benefit of this kind of lack of proper knowledge about the forensic. So there felt dire need to apply a such technique which could solve this great problem and proper justice could be provided to the victim as well as society. By the passing of the time the judiciary started to take the interest in application of the scientific techniques. And till now various decisions on the behalf of these scientific techniques has been passed by the judiciary successfully. And it becomes possible to control the commission of the crime.

The present judicial system of India comprises various modes of techniques including DNA Profiling, Brain-Fingerprinting, Narco-Analysis, Polygraph, DNA Fingerprinting, forensic DNA etc which is proving very

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helpful in solving the crime problem. At present courts are taking these techniques into consideration while delivering judgments.

In future it would impossible to solve the crime and to find out the criminal without applying these techniques. Day by day the new technological developments take place. So there is a need to apply to such techniques so that the society could be protected from the commission of the crime and if crime commit by any person, he could be punished.

Even though these scientific techniques are proving very helpful asset to the society as well as the criminal justice system, but there are also some bad consequences of the application of these techniques. Little bit temperament with the scientific evidence reverse the result of a finding of the crime. By the present article the effort has been made to disclose the relevancy of the techniques of forensic science as well as their bad consequences if not conducted with care.

Key words: *DNA Profiling, Lie Detector, Brain Fingerprinting, Ear Printing, etc.*

I. Introduction

“To everyone who thinks impartial forensic science is necessary for justice.”

Max M. Houck

Vice President,

Forensic and Intelligence Services, LLC

Forensic science is known to be the science of correlating the person, thing and place which indulge in felonious activities. With the aid of these scientific disciplines it has become a snap to investigate and to adjudicate the civil as well as criminal cases very easily. Forensic science or forensics, as it is commonly known, is the application of science to find answers that the legal system seeks. According to English Oxford dictionary “forensic science is mixed science.³ These answers may pertain to criminal or civic actions. It is also very much associated with the scientific field today. Forensic science which is used to answer criminal question provides answers through the comparison with biological evidence, controlled substances and firearms that may be found at the site of the crime. In earlier times When justice was served by the science by its suggestion or inference to questions before the court, it was said that forensic science is undoubtedly diversified science. Recently, forensic science has developed itself as a distinct profession and into a science having its own rights. In forensic science, forensic scientists play a vital role in crime investigation before the court through their work by proving fact through their report and testimony.⁴

³Oxford English dictionary, 2005.

⁴Max M. Houck and Jay A. Siegel, *Fundamentals of Forensic Science* 4 (Elsevier publication UK 3RD Edition, 2015).

With the growth and development of the society, the nature of the crime has been also changing and diversifying. According by the criminal also often uses different techniques for commission of various crimes within our society. So it has become a problem for the law enforcing agencies to check the potentiality of crimes. For such checking the need of forensic science becomes an essential prerequisite on the part of the investigative agencies. Today, guardian of law heavily depend of various technologies and advancement of science to help them in their fight against crime.

At present forensic science is proving an effective tool for the criminal justice system. There has been various advancement in forensic science that has specially been welcomed in criminal investigation .Many disciplines of forensic science are undergoing change around the world.With the help of trace evidence and impression evidence like fingerprint, tire tracks and footwear impression and all other evidence that may be found in a scene of crime, the necessary answers for the criminal investigations can be found with the help of forensic science. New methods of forensic science are being developed, authenticated, and put into use to help in the investigation of crime. The validity and exactitude of older and even modern methods are being defied. New methodologies are being introduce for interpreting evidence via probable demonstrating. A better appreciation of the difficulties that can exist in the field of forensic science is gained when the diverse cultures of scientific laboratories, law enforcement and the legal community interact.⁵ With the help of forensic science valuable evidence relating investigation and prosecution may be traced out. It also provides insight into crook characteristics and criminal behavior. Forensic science disciplines are gradually more relied upon by law enforcement to resolve the crime, and by the judicial system to prosecute offenders. In present forensic science is an integral part of the criminal justice system as many matters have remained resolved with the aid of various forensic science techniques like DNA Profiling, Narco-Analysis test, Polygraph test, Brain Mapping, Brain Fingerprinting, etc. The effectiveness of forensic science in the criminal justice system, designed to understand how criminal justice actors use forensic services and with what degree of effectiveness.⁶

Magnetic Fingerprinting and Automated Fingerprint Identification (AFIS)

The automated fingerprint identification system (AFIS) is a biometric identification methodology in which the digital technology is used to find out, store and examine fingerprint data. For the first time this technique was used by the US Federal Bureau of Investigation in solving criminal cases. By the evolution of this emerging technique of forensic science it became very easy for the investigating authority like police and forensic scientists to compare the fingerprint find at the crime scene.⁷

⁵John M. Butler, "U.S. initiatives to strengthen forensic science & international standards in forensic DNA" 18*Forensic SciInt Genet.* 4-20(September 2015).

⁶ Kelvin J. Strom and Mathew J. Hickman(ed.) *Forensic Science And The Administration Of Justice: Critical Issues And Directions*100 (Sage Publication, London, New Delhi, Singapore, Washington DC, 2015).

⁷AFIS available at <https://searchsecurity.techtarget.com/definition/Automated-Fingerprint-Identification-System> (visited on date 14/09/2018).

The Ear Print Analysis

At present this is proving an emerging technique in the field of forensic science. According to this technique every individual has unique ear surface. When the ear of any individual is pressed against a surface, material which present on the surface of the ear is left behind, forming a two dimensional ear print. By matching ear print of two individual presenting on crime scene it can be found out that who is suspect.

Video spectral comparator 2000

This is a new technique in the field of forensic science. This is the machine by which forensic scientist and crime scene investigator is able to examine a piece of paper and get covered or concealed writing, conclude the quality of paper and source and “lift” indented writing. Video Spectral Comparators 2000 (VSC 2000) is the technique which is based on the analysis of video spectral imaging. In this technique a camera, special light sources and filters used for the visible UV and near IR region by the forensic scientist and crime scene investigator.⁸ In this technique the examination of the features of the document is done by applying the altered frequencies of light source which is in question without affecting any kind of demolition and contributing to the identification of the document preparation approaches followed: keying procedure, indentions, removals, inks used, handlings, safety elements, holography, etc.⁹

Narco-Analysis Test

It is similarly recognized as a truth serum test. In the present scenario, it is proving as a valuable technique to the forensic science. With the help of Narco-Analysis test many crimes have been solved by the investigating authority. In this test the person upon whom such test is conducted, tell the truth due to the effect of the drug which inject into the body of the by expert. Sodium Pentothal, Sodium Amythal, Scopolamine etc use for conducting this test. Due to the effect of the drug, the person became unconscious and speaks truth. In this technique some question asked from the person in the stage of semi consciousness. Because due to the effect of the medicine the person does not have any control over the thinking power, so he speaks truth on asking question from him.

Alternative Light Photography

For a forensic medical attendant, having the option to rapidly determine how much physical harm a patient has endured can be the difference between life and death. Despite the fact that they have numerous tools available to them to help make these calls rapidly and precisely, Alternative Light Photography is one of the technique to help see harm even before it is visible on the skin. A camera, for example, the Omni chrome utilizes blue light and orange filters to undoubtedly show wounding underneath the skin's surface. By the help of this technique, it is very easy to know about the time of injury caused by any person.

⁸<http://www.cepericcyj.com/en/laboratorio.html> (visited on date 16/09/2018).

⁹ Ibid.

High speed ballistic photography

High speed cameras are used by the ballistic expert to know about the nature of bullet holes, gunshot wounds and glass shatters are created at crime scene. With the help of this technique the angle of bullet holes is determined by the investigation agency.¹⁰ It became very easy to detect the criminal by this technique.

DNA Fingerprinting

The concept of DNA fingerprinting was introduced by Alec Jefferys in 1985. It is considered as most powerful tool to identify an individual. Earlier an individual was identified using any conventional technique like MNS, Rh. ABO, blood group etc., but now DNA fingerprinting is preferred because DNA is much more resistant to the degradation caused by environmental condition.¹¹ By this technique, semen, hair, and blood of the criminal found in the victim's bodies, can be compared to the defendant's genetic makeup, this technique may also be used to identify the body of a victim.

DNA Profiling and Its Different Techniques

DNA, which is known as Deoxyribonucleic Acid, is an organic substance which is found in every cell found in every human body except the red blood cells. Every individual has unique DNA. But DNA of identical twin is same. DNA Profiling has particular application of criminal law because of the possibility that it offers of determining whether blood or semen deposits located at the crime scene of a crime come from a person suspected of having committed the crime. Presently DNA Profiling is playing a pivotal role in solving the crime problem. It is helpful in solving the case relating to paternity as well as relating to murder, rape, etc. DNA Profiling provide huge bang for the buck in reducing crime.

With the help of DNA Profiling it is possible to find out the differences among the DNA samples which have been collected from the different persons. There are various new techniques of DNA Profiling like Polymer Chain Reaction technique, Short Tandem Repeat technique, Variable Tandem Repeat technique, Single Nucleotide Polymorphism, mitochondrial DNA analysis, Y Chromosome DNA analysis etc.

Relevancy of Newfangled Techniques in Criminal Justice System

Advancement in science nowadays provides law enforcement agencies with unparalleled opportunities to identify those suspected of having committed crimes. At present these techniques are proving very helpful in the criminal justice system. Several illegal as well as civic matters have remained solved with the help of these techniques, but there are some bad consequences of the scientific techniques also. In case of *Gautam Kundu v. State of West Bengal*¹², "it was held by the apex court that the disputed paternity can be determined with the help of the DNA Profiling test. The court can rely upon it as a circumstantial evidence, which ultimately excludes certain

10. Modern Policing- Forensic Technology Helping To Solve Crime available at <https://oliviawildbooks.wordpress.com/2016/06/23/modern-policing-forensic-technology-helping-to-solve-crimes/> (visited on date 15/01/2019).

¹¹ Ramesh Chandra, *Forensic Science And Crime Investigation* 3 (Abhijeet Publication, New Delhi, 2005).

¹²(1993)3scc418.

individual as a father of the child. The court also held that no one can be forced to give samples of blood for analysis against his/her will and no adverse inference can be drawn against him/her.”

Herbinder Kaur v. State of Punjab¹³, in this case “*the order gave order for conducting DNA tests to petitioner child and the respondent. It was held by the court that the result of DNA testing is 99.9% accurate in determining paternity, it is the require of the cases involving crime against women.”*

In case of ***Sharda v. Dharma Pal***¹⁴, the supreme court held that “*if a person refused to submit him to such medical examination despite an order by the court, a strong prima facie case for drawing an adverse inference would be made out section 114 of the Indian evidence act also enables a court to draw an adverse inference if the party does not produce the relevant evidences in his power a possession.”*

Rohit Shekhar V ND Tiwari¹⁵, “*it was a famous case relating to the DNA Profiling test. In this case on the behalf of conducting DNA Profiling test, it could possible to determine the paternity of Rohit Shekhar. In this case ND Tiwari was declared as the father of Rohit Shekhar on the behalf of the DNA Profiling test. The court held in this case that a person can be physically compelled to undergo DNA test. The party against whom the order has been given for DNA test can not be asked to satisfy itself merely with the fact that if such person refuses to undergo the test, adverse inference will be drawn against him.”*

Bhabani Prasad Jena, etc. v. Convener Secretary Orissa State commission for women, the court held that “*once here is noticeable contradiction between right to reach the truth, the courts be required to do exercises its discretion only after balancing the interest of the parties and on due consideration whether for a just decision in the matter, DNA is eminently needed.”*

Nandlal Wasudeo Badwaik v. Lata Nandlal Badwaik and Another¹⁶, “*in this case the paternity was challenged before the court by the father. DNA test was conducted for two times, the result of the DNA test was that petitioner was not the biological father of the child. It was held by the Supreme Court that the result of the DNA test is quite accurate, but the presumption of the conclusiveness of legitimate mention under section 112 of Indian Evidence Act, 1872 cannot be ignored. On this behalf the result of DNA test was ignored by the court.”*

In the case of ***Santosh Sharmanbhai Ladeja v. State of Gujarat***¹⁷, it was held by Gujarat High Court that “*medical experts conduct Narco- Analysis test under their supervision and this is required to take proper care and there is close watch on the condition of the alleged and as such, there is minimal risk towards the life of the accused person. Only on this behalf conducting such test cannot be condemned. In this case it was also held by the court that according to the need such test must be conducted on the accused person.”*

¹³ CrI. Misc. No. M-31938 of 2011.

¹⁴ (2004) 4 SCC 493.

¹⁵ 2012 (2) RCR(Cri.) 889.

¹⁶ (2014)2 SCC 576.

¹⁷ 2007 criLJ4566

Abhay Singh v. State of U.P¹⁸ Justice Barkat Ali Zaidi held that “*the accused person can be compelled to give hair and nail without his/ her consent for the purpose of investigation. It was further held that such principle should also apply in case of Narco-Analysis test and Brain Mapping test. All efforts should be made to find out the culprit. If by conducting Narco-Analysis test Brain Mapping test, the truth may be established, these tests should be directed for conducting on the accused person without his/ her consent.*”

Ranjit Singh Brahamjeet Singh Sharma v. State of Maharashtra and Another, “*it is a significant case relating to brain mapping test because the court left the question without given decision in this case regarding the permissibility of such test. It was held by the court that the acceptability of Brain Mapping test depends upon the fact and circumstances of each and every case.*”

Ramachandran Reddy v.State of Maharastra¹⁹, in this case “*the authenticity of the use of brain mapping , P300 and Narco- analysis test was upheld by Bombay H.C. . The court held that the evidence is admissible if it is produced under the under influence of Narco-Analysis test. The court also held that Narco-Analysis test contains slight physical harm. As it is clear that this test is really very helpful in detecting the crime as well as criminal because criminal are very professional as they are taking new techniques in to consideration in commission of the crime due to technological development.*”

In a well-known case of **Santokhben Sharmanbhai Ladeja v. State of Gujarat²⁰**, “*there was issue before the court concerning conducting Narco-Analysis test and Brain Mapping test without taking consent from the accused. Whether it would be violative to the Article 20 (3) of constitution and Article 21 of the Indian Constitution. In this case Gujarat High Court held that no such provision is given under Cr.P.C and it is part of the investigation. So there is no need to take consent from the accused person for conducting such tests and it would not be violative to Article 20(3) and Article 21 of the Indian Constitution.*”

Surendra Koli v. State of U.P. and Others²¹, it is a famous case in which “*the court gave order for conducting Narco-Analysis test and Brain Mapping test on the main accused Moninder Singh Pandher and his servant Surendra Koli. Both were accused of serial killing of women and children. These tests were conducted on the accused person for making certain the genuineness of their statement made by them during their custodial examination. Such tests were performed in the Forensic Laboratory in Gandhinagar in January 2007. During examination, various confessional statements were made by the accused person concerning the killing of women and children. The court upholds death penalty for the accused person.*”

In case of **Sunil Kumar Virijbhai v State Of Gujarat²²**, “*the three scientific test viz Polygraph test, Narco-Analysis test and brain mapping test were conducted with the consent of the accused person. On the behalf of these scientific tests the innocence of the accused person could prove.The court held that the modern scientific techniques are very helpful in crime investigation. These are proving valuable asset for Criminal Justice System*”.

¹⁸ 2009 Cri.L.J2189(All)LK Bench

¹⁹ 2004 All MR (Cri) 1704

²⁰ 2008Cri.L.J.68

²¹ AIR 2011SC 970.

²² Decided on 27 april 2018

Cases in Which Court have denied for These Scientific Tests

Even though at the present time these scientific techniques are proving very helpful for the crime investigating agencies. But there are so many cases in which court did not allow for conducting these tests without taking the consent of the person. In case of *Chattisgarh v. Sunil alias Balkaran Sahu and Another*²³, it was held that “DNA technique has now been expressly included among various forms of medical explanation to section 53 of the Cr.P.C DNA Profile is different from DNA sample which can be obtained from bodily substance. A DNA Profile is a record created on the basis of DNA sample made available to forensic expert. Matching of the DNA sample is emerging as a vital tool for linking suspect to specific criminal acts. In case of DNA Profiling of the accused, the delay in sending samples of saliva spit of accused for examination cannot be sole ground to acquit accused in the presence of other incriminating circumstances.”

*Natvarlal Amarshibhai Devani v. State of Gujarat and Another*²⁴, in this case it was held by the Gujarat High Court that “the voice sample cannot be included in term examination or such other test as explained in section 53 of the code. Section authorizing only registered medical practitioner to conduct the examination. Whereas for the purpose of collecting voice spectrography test, assistance of an expert is required, voice spectrography test requiring suspects to only furnish voice sample not falling within ambit of psychiatric treatment. The test is not violative of article 20 (3) of the constitution of India.”

In case of *Sabra Khatoon v. State of Jharkhand and Others*²⁵, it was held that “no individual could be forcibly subjected to and of such technique. Whether in the context of investigation in criminal cases or otherwise. Thus, if the accused refuses to undergo Narco-Analysis test and Brain Mapping test, he cannot be forced to undergo such tests.”

II. Conclusion

On the behalf of the present study, it may be said that presently the significance of the scientific techniques is increasing by passing of the time as the new techniques are taken into consideration for committing the crime and it is not possible to detect the crime and criminal with the help of old techniques. Even though the validity of the scientific techniques has been in question and the argument is there that the result of the scientific techniques are not entirely reliable. For example Narco-Analysis test is conducted by injecting a drug intravenously i.e sodium pentothal, due to the effect of the drug the person lost its control from mind and talk freely. But there is no effect of the drug on the person who habitually drink alcohol. Likewise, there are other scientific techniques like BEAP and Polygraph test which help in solving the crime. With the help of these techniques it can easily be found out whether the person is lying or not and gauging the criminal’s acquainted with the information which is related to the crime. By measuring the physiological responses of the suspect, the conclusions may be drawn. such test is conducted on

²³ 2017 crilj 1854.

²⁴ 2017 CriLJ 1911.

²⁵ 2017 CriLJ 3357.

the basis of assumption that there is interaction between body and mind. Though, the trustworthiness of these techniques partakes remained repetitively questioned in practical studies. The trustworthiness of scientific evidence bears a causal link with a number of dimensions of the right to a fair trial such as the requisite standard of proving guilt beyond reasonable doubt and the right of the accused to present a defense in the context of criminal cases.

Finally it can be concluded that in today technologically developed world, advanced made in the field of the forensic science and its application in the legal field is raising lot of positive and negative views. However, there are certain civil as well as criminal problems, which in the modern time can be best proved by taking the assist of modern scientific techniques.

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