

REVIEW

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Impact of DNA evidence in criminal justice system: Indian legislative perspectives

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Abstract

Background: The scientific and technological advances along with the changing socio-economical standards of society have posed new challenges to the criminal justice system. With the changes in society and technology, there is also an increase in crime rate. Forensics provides the scientific proofs beyond the shadow of reasonable doubt and thus significantly contributes in criminal as well as civil investigations and legal matters.

Main body of the abstract: Discovery of DNA has opened new avenues and the advancement of DNA technology and its introduction into the court of law has provided extensive aid in the resolution of civil and criminal disputes. In India, the DNA technology was first introduced in a paternity dispute in 1989. However, the need for legislation and guidelines to support grounds for the use of DNA profiling for forensic purposes in India has been recognized for some time now. In July 2019, the DNA Technology (Use and Application) Bill 2019 was introduced in the Indian parliament.

Short conclusion: Herein, this article is focused on the current aspects of DNA based evidence in the Indian Criminal Justice system along with the associated issues, highlighting the need for specific DNA based legislation.

Keywords: Criminal justice system, Forensics, DNA technology, DNA technology (Use and Application) bill 2019

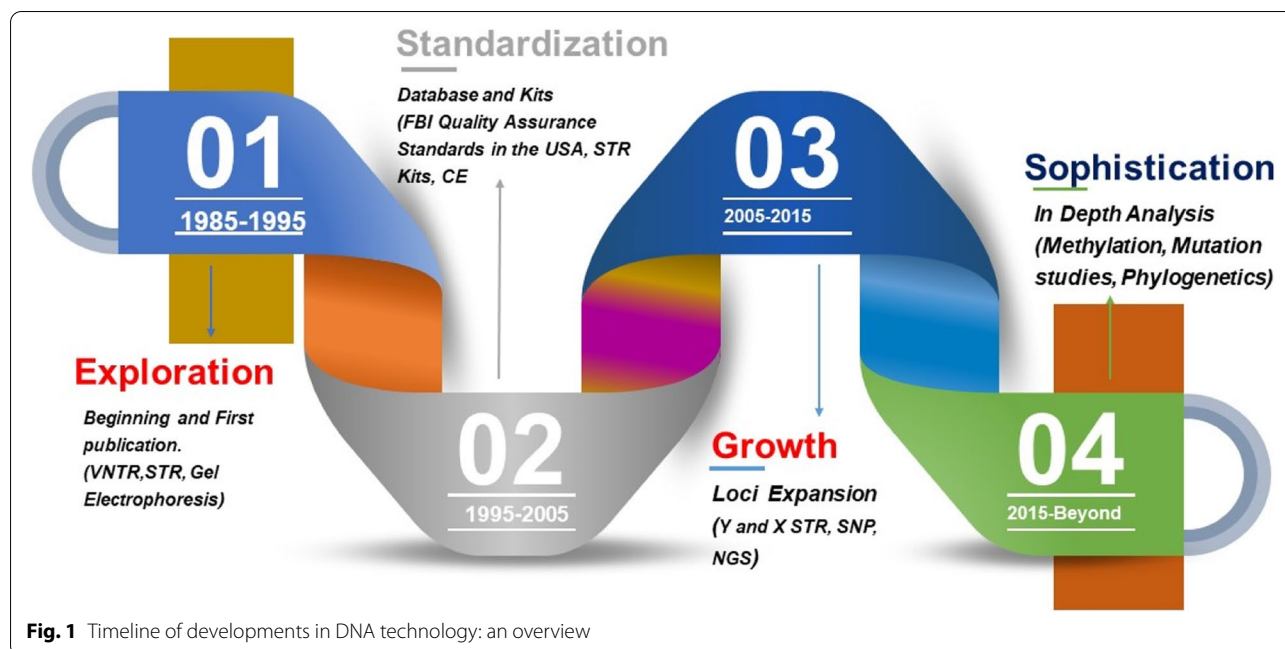
Background

Advances in scientific technology have brought revolutionary changes in people's life. Along with the positive aspect of these changes in the lifestyle and facilities, these advancements have posed a problem for the law enforcement agencies to prevent the misuse of the technology by criminals to commit an offence. The scientific analysis of the exhibits provides substantial scientific evidence. The application of science for the criminal investigation is termed as Forensic Science. These technological advancements have been found in many scenarios to have a serious impact on the administration of justice. However, the judicious use of technology can drastically revolutionize

the criminal justice system (CJS). As evident from the previously published literature, many persons were protected from being convicted by using forensics who were wrongly suspected or accused (Jayewardene 1988; Brown 1998; Sedley 2005). Based on these studies and cases, it should not be ignored that this advanced technology could not be implemented without affecting the conventional legal principles for the betterment of judicial system. It is still an issue of debate as how to optimally use the technological advances and how much is the need to modify the current rules and regimens. To adopt scientific advances, it is of utmost importance to establish a balance between the conventional rules and constitutional rights. It has to be ensured that human rights, i.e., Right to Privacy, Right against Self-incrimination, etc. are not violated by these advances (Kirby 2001; Walsh 2005). However, in the course of a criminal investigation or while applying the technology in the court of law, it sometimes becomes difficult to use a technology without

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affecting these human rights, e.g., a conflict between right to privacy as well right against self-incrimination and taking samples for investigation purpose is apparent. Another important issue requiring serious attention of the policy-makers is to minimize the chances of misuse of a technology against public interest (Adhikary 2007).

The discovery of deoxyribonucleic acid (DNA) has opened various prospects in the forensic genetics. DNA technology has been found to be an efficacious investigative technique corroborating the guilty or innocent in the court of law (Kirby 2001; Adhikary 2007; Kumar et al. 2016). The legal perspective of DNA evidence is an emerging issue in India due to the absence of specific legislative grounds for the using DNA technology in day-to-day acts of jurisdiction. Currently, some existing laws are governing it, although India is exercising to enact legislation since 2003. This article outlines the emerging issues raised by the application of scientific advances to the CJS and the need for a DNA profiling bill and further reforms in the existing laws.

Development of the DNA technology

In 1950, the discovery of DNA and its recognition as the universal genetic material opened new possibilities in the field of research and development. However, DNA technology was firstly applied for forensic purposes in 1985 in an immigration dispute (a civil case) in the United Kingdom (U.K.) while Prof. Alec Jeffrey of Leicester

University, UK, applied DNA technology in the probe of a criminal case¹ (Colin Pitchfork case, 1986) in England (Jeffreys et al. 1985). The introduction of DNA technology revolutionized the field of criminal justice. From the discovery of DNA fingerprinting, till now, it has been technologically evolved as shown in Fig. 1. Although fundamental principles are still the same, i.e., every individual has a unique DNA and it transfers from one generation to another, thus can establish the genealogy of an individual (Jobling and Gill 2004).

The initial DNA technology, as formulated by Sir Jeffrey, was based on restriction fragment length polymorphism (RFLP), has undergone various developments. RFLP required a genome of high molecular weight, i.e., DNA in sufficient quantity (about 10 ng). In most of the case, the biological sample faces many adverse conditions such as humidity, high temperature, etc. that degrades the DNA. Similarly, sometimes the sample is available in trace quantity. In this regard, the introduction of polymerase chain reaction (PCR) in 1990 made an enormous contribution to deal with aforesaid problems. Short tandem repeat (STR)-based DNA analysis is very sensitive and it can also generate the profile even from (partially) degraded sample. Here, it is remarkable that DNA Fingerprinting Congress, in the 1990s, made valuable contributions in the technological developments of DNA typing. Since the innovation of DNA and its technological advancement from RFLP to STR, DNA evidence

¹ Visible Proofs: Forensic Views of the Body: Galleries: Cases: Alec Jeffreys and the Pitchfork murder case: the origins of DNA profiling (nih.gov)

is globally accepted. DNA phenotyping is now attracting the attention of the professionals, scientists (Butler 2015a, b; Shrivastava et al. 2016). In India, recently several population studies based on STR markers have been published (Srivastava et al. 2019a; Srivastava et al. 2019b; Shrivastava et al. 2020).

DNA evidence played a vital role in the investigation of various criminal and civil cases (Iyengar and Hadi 2014; Prahlow et al. 2017). The term 'corpus delicti', which means establishment of events or linkage to the crime, is commonly used in forensic case works and legal proceedings. In this regard, establishment of personal identity is of utmost importance. Many techniques for the personal identification are utilized, i.e., fingerprints, anthropometry, poroscopy. However, it has certain limitations in case of identification of the mutilated bodies, body fluids, bone, etc. In such situation, it is only the DNA technology, which could assist in drawing a conclusion (The Royal Society and The Royal Society of Edinburgh 2017; Wrobel et al. 2018).

DNA not only facilitated apprehending of the culprit but also saved the innocent from wrongful convictions. Project Innocence is a notable example of this (for more details, see <https://innocenceproject.org>). With adjudicating in criminal and civil cases, DNA has been found as an enormous aid to deal with the problem of human trafficking. The problem of human trafficking and child abuse has been alarmed for law enforcement agencies and human rights organizations across the globe. As per the figures of United Nations Children's Fund (UNICEF), very big numbers (i.e., 300 million) of children are being exploited and abused. Besides this, illegal adoption is another serious challenge confronting society. It has well pronounced that for the identification and the rehabilitation, DNA is a perfect tool. In this consonance, it is very remarkable that in 2006, the University of Granada Genetic Information Laboratory, Spain initiated a mission with the support of the Government of Spain. The identification and rehabilitation of the children and women (potential victims of human trafficking) are the prime aim of this project. DNA PROKID is a collaborative project that is helping other countries to generate two parallel DNA database, i.e., first is the questioned database (profiles of children without family) and second is Reference database (profile of relative who have reported the missing). "DNA PROKID Kit" prepared by University of North Texas Center for Human Identification (UNTCHI) and Bode technology, is being used for the sample collection. This kit enables easy collection of the sample by eliminating the chances of contamination. This project has successfully led to the identification and rehabilitation of more than 900 children to their families.

"DNA PROKID" may be an effective tool to deal with the issue of illegal adoption (Alvarez-Cubero et al. 2018).

The introduction of DNA as evidence in the CJS

The DNA typing has significantly contributed to the administration of justice in various civil as well as criminal cases. The immigration case in the UK was the first civil dispute solved with DNA evidence. In the famous Colin Pitchfork case, DNA evidence not only identified the offender but also saved an innocent. The role of DNA evidence in various civil and criminal cases has established it as "Genetic eyewitness". Robert Melia case, case of Ghanaian boy (immigration case in the UK), Andrew v. Florida², etc. are some flagship cases in the history of forensic genetics (Bureau of Justice Statistics 1991).

The report of DNA is admissible in the court as based on the belief that it has been made from the experimental knowledge that DNA is a unique genetic code. It is well established that no two individuals can possess an identical DNA profile. The advances in genetic science made a serious impact on society as well as on the criminal justice system (Adhikary 2007; Verma and Goswami 2014). The DNA evidence has been found to be an effective tool to establish the identity of a person with a high level of accuracy and has been referred to as "new gold standard" in Forensic Science (Lynch 2003).

However, DNA technology has been challenged in many countries on various grounds (Butler 2015a, b). In spite of the objections raised, the introduction of this technology has brought a revolution in the judicial realm. Technological advancements have led to the increased credibility of DNA evidence that is efficient enough to contribute towards the administration of Justice (Grubb 1993; Virkler and Lednev 2009; Verma and Goswami 2014). Validity of the evidence has been significantly raised in legal debates and trials. Internationally, to determine the relevancy and admissibility of scientific evidence, there are various standards or protocols, e.g., Frye test, Daubert test, prejudicial effect test, usefulness standard. Validity is measured in terms that whether the evidence is producing misleading or confusing impressions or not (Lynch and McNally 2003).

The admissibility of the evidence also depends upon the collection, packaging and forwarding procedures (that ensures the intact chain of custody) along with good laboratory practices. The credibility of an expert's opinion depends upon various factors. In this regard, the experience and qualification of a person for being an expert, accreditation of the laboratory and procedures are must for quality control and quality management. This is important to avoid the allegations such as

² 533 So.2d 841 (1988)

'tampering with the evidence.' In such scenario, benefit of doubt might be given to the accused due to the poor scientific/analytical proceedings. In legal and scientific contexts, possibilities of contamination, false inclusion or exclusion, secondary and tertiary transfer of DNA have also been debated as well as outlined (Patel et al. 2013; Gupta et al. 2016; Murphy 2018).

The Indian Judiciary has appreciated and relied upon the DNA-based evidence for the criminal investigation and identification purposes. In the literature, it has been witnessed that DNA based testing have also formed the basis for appeal in higher courts for various cases. In India, the first forensic DNA test was conducted at the Centre for Cellular and Molecular Biology (CCMB) in 1989. Later on an institute named as Centre for DNA Fingerprinting and Diagnostics (CDFD) was founded in 1998, especially for the purpose of forensic DNA testing for various civil and criminal cases. Additionally, Central and State Forensic Science Laboratories (also known as CFSL and SFSL respectively) are providing DNA expertise to the court of law (Central Forensic Science Laboratory, Kolkata, Directorate of Forensic Science Services, Ministry of Home Affairs Govt. of India 2007). Additionally, Laboratory for the Conservation of Endangered Species (LaCONES) at Hyderabad is providing scientific aid for the means of wildlife identification. The institute accepts cases referred by the court or any other law enforcement agencies and the expert of this institute does not appear in the court of law. The Wildlife Institute of India (WII) Dehradun also conducts forensic DNA practice for wildlife purposes (for more details https://wii.gov.in/wildlife_forensic).

Evidential significance of DNA in criminal and civil proceedings/disputes in India

The fair investigation is a necessity for complete justice. Scientific aids to the criminal investigation and strengthen the pathway of fair justice. The introduction of DNA technology in CJS has made a drastic impact on the judicial realm. DNA plays a critical role and provides scientific evidence beyond reasonable doubt in several criminal investigations, i.e., sexual assault, child abuse, murder, and civil cases, e.g., paternity or maternity disputes. DNA has also played a vital role in the investigation of blind and cold cases. In India, the DNA technology was introduced for the first time in the court in 1991 for the settlement of a paternity dispute *Kunhiraman vs Manoj*³. Since then, DNA evidence has been used in India for the settlement of various criminal and civil disputes as well as multiple high-profile cases (Shrivastava et al. 2016).

The Indian Evidence Act (IEA) was enacted in 1872 to ascertain the admissibility of the evidence as a matter of fact. The concept of admissibility was changed with the introduction of the IEA. Since the inception of the evidence act, it has remained unchanged with exception of time-to-time amendments in few sections. The Evidence Act is administered by the both civil and criminal courts. The IEA is also concerned with the, in addition of type, both the quantitative and qualitative aspect of evidence required to operate a litigation.

Sec 45 of IEA explains the expert opinion. It designates the persons especially skilled in foreign law, science, art, handwriting or finger impressions as an expert and the opinion of such experts in related questions is considered as relevant. DNA technology fits in with section. In the case of *Kunhiraman vs Manoj*, the court considered the report of DNA expert admissible under sec 45 of IEA. Detailed view of court on this is discussed later in this paper.

The Indian judiciary relies upon oral testimony in accordance with the provisions of sec 60 of IEA. Scientific evidence is generally referred to as corroborative or supportive evidence and thus cannot form the basis of conviction solely. If any contradiction between eyewitness and scientific evidence is apparent, court prefers eyewitness testimony (Goswami and Goswami 2018).

Examples of the role of DNA profiling in criminal cases

DNA evidence have proven to be a significant tool for the identification in various offences such as murder, rape, and theft, where the conventional methods are of limited use. In the current scenario, cases of sexual offences are one of the serious offences against females which are increasing at an alarming rate as depicted in Fig. 2 (National Crime Record Bureau Ministry of home Affairs 2019). The case of rape followed by murder poses various challenges for the investigator. Scientific examination, especially the DNA test of the victim and accused/culprit, is of paramount importance. DNA plays a vital role in corroboration of the evidence, victim and culprit.

In India, there have been several highlighted cases of rape and brutal murder in which DNA evidence has led to the successful conviction, e.g., Tandoor case⁴ (also known as Naina Sahni case: DNA profiling was conducted from the burnt remains in the tandoor of the victim), Priyadarshini matoo case⁵, Shradhhananda case⁶, Nirbhaya case⁷ (it led to several legal reforms and amendments). Apart from these, in the assassination of

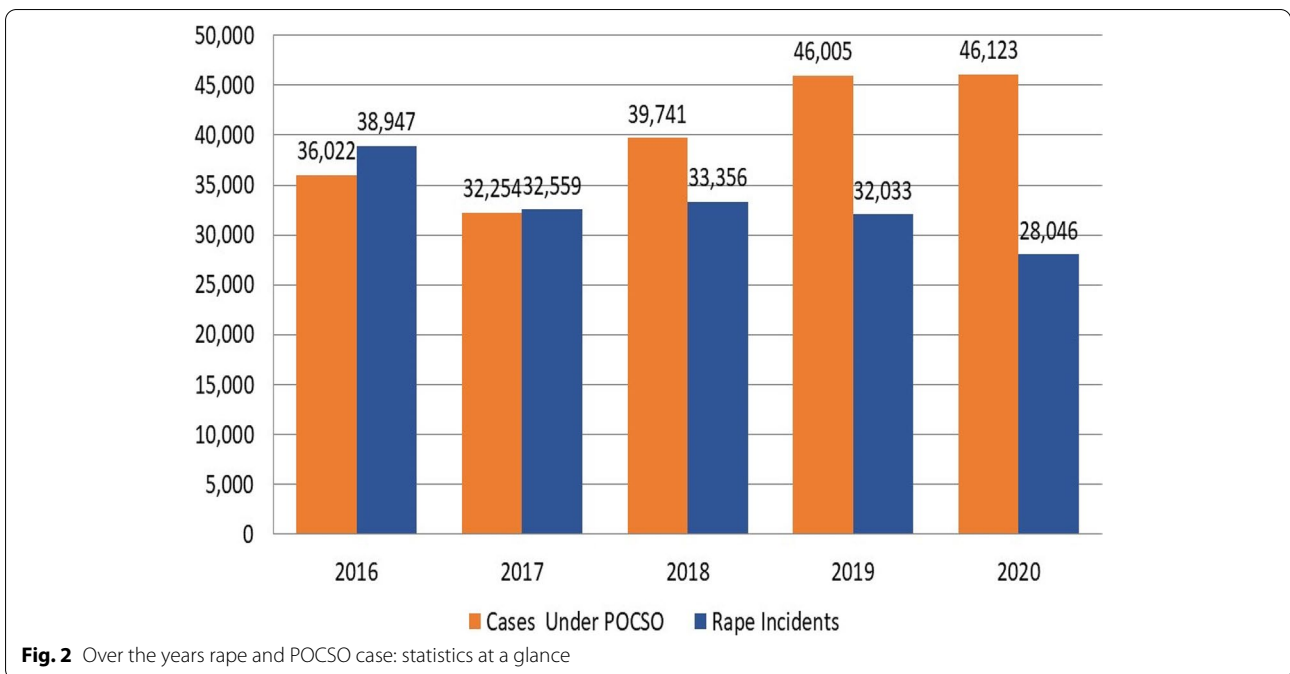
³ II(1991) DMC 499

⁴ 2007 CriLJ SC 4008

⁵ 2007 CriL J 964

⁶ 2008 13 SCC 767

⁷ (Crim App. No. 1398/2013, The High Court of Delhi)



former Prime Minister of India Shri Rajiv Gandhi in a suicidal bomb blast and murder of Mr. Beant Singh (former Chief Minister of Punjab state, India), DNA profiling of disintegrated body parts led to the identification of the deceased. In the case of Rajiv Gandhi, the perpetrator was also identified using DNA test. A very high-profile case of Sheena Bora is also an example of identification through skeletal remains by DNA profiling. Above said examples suggest that DNA profiling has served as a very efficacious tool for the identification of a victim of terrorist attack, where conventional methods were of limited use (Gupta et al. 2016; Goswami and Goswami 2018).

Examples of the role of DNA profiling in civil cases

The case of *Kunhiraman vs Manoj* is a landmark in the history of the Indian judiciary. In this case, the Chief Judicial Magistrate (CJM) stated the opinion of the expert of the DNA report as quoted “The evidence of the expert is admissible under sec. 45 of Indian Evidence Act. So, the ground on which the opinion is arrived at is also relevant U/S 51 of the Indian Evidence Act. PW4 is an expert in the matter of molecular biology and the evidence tendered by him is quite convincing and I have no reason why it should not be accepted. Just like the opinion, if a chemical analyst or like the opinion of a fingerprint expert, opinion of PW4, who is also an expert in the matter of cellular and molecular biology, is also acceptable”. Mr. Kunhiraman was proven to be the biological father of the child. This verdict was appealed to the Kerala High Court, which was upheld by the court (Adhikary 2007).

Another paternity dispute, *Kantidev vs Poshiram*⁸ case, the court clearly stated that “The result of a genuine DNA test is said to be scientifically accurate. But even that is not enough to escape from the conclusiveness of Section 112 of the Act, e.g. if a husband and wife were living together during the time of conception, but the DNA test revealed that the child was not born to the husband, the conclusiveness of law would remain un-rebuttable. This may look hard for the husband who would be compelled to bear the fatherhood of a child who is not biologically his own. But even in such case, the law leans in favour of the innocent child from being bastardized if his mother and her spouse were living together during the time of conception. Hence the question regarding the degree of proof of non-access for rebutting the conclusiveness must be answered in the light of what is meant by access or non-access as delineated above” (Verma and Goswami 2014; Law Commission of India, Department of legal affairs, Govt. of India 2017).

This judgment formed the basis for the verdict in another paternity issue of *Nandlal Wasudeo Badwaik vs Lata Nandlal Badwaik*⁹. In this case, the husband appealed for a DNA test to establish the paternity of his child. In the DNA report, the father was excluded as the biological father. The wife pleaded for the section 112 of the Indian Evidence Act as marked in the case of *Kantidev vs Poshiram*. The court held that “depending on

⁸ 2001 (5) SCC311

⁹ AIR 2014 SC 932

the facts and circumstances of the case, it would be permissible for the Court to direct the DNA examination to determine the veracity of the allegation(s) made in a case. If the direction to hold such a test can be avoided, it should so be avoided. The reason is that the legitimacy of the child should not be put in peril" (Law Commission of India, Department of legal affairs, Govt. of India 2017).

It is revealed from the available literature that the Indian Judiciary has undergone a shift for relying on DNA report over sec 112 of IEA. Earlier Indian court preferred Sec 112 of IEA for the presumption of the legitimacy. The first decade of the twenty first century indicated the use of balanced approach by the Indian Judiciary. It is interesting to note that with the second decade, Judiciary has also started to rely more on the DNA test to establish the paternity (Goswami and Goswami 2018).

Dealing with the issue of privacy and self-incrimination

The issue of privacy and self-incrimination has been a subject of debate for a very long time in Indian Judiciary. Globally, amendments in the legal provisions have been made to balance this with technology for administering the justice.

The Right against self-incrimination and Right of life and personal liberty are designated as fundamental rights according to the article 20(3) and article 21 of Constitution of India (COI). In this consonance, the procedures necessarily be just, fair, and equitable. In accordance with the article 14 of COI, ensuring the equality before the law, procedures cannot be discriminatory or arbitrary. The procedures and principles of evidence applied to the criminal proceedings must be in compliance with the parameters of article 20(3) and article 21.

Indian law does not allow forced medical examination of rape victim. Under Section 164A of the Code of Criminal Procedure, 1973, a rape victim can be medically examined only with her consent or consent given by the person of competent authority. Even a child above the age of 12 must consent to medical examination and if the child is below 12, a parent/guardian must give consent for the same. It is mandatory to record her consent in the medical examination report. On the other hand, a male accused of rape can be subjected to mandatory medical test for collecting scientific evidence, including DNA, against his will as provided in Section 53-A of Code of Criminal Procedure, 1973 (Adhikary 2007; Gupta et al. 2016). In section 53-A, the term "examination" denotes the testing of blood, blood stains, semen, swabs (in case of sexual offence), sputum, sweat, hair samples, and finger nail clippings utilizing scientific and modern techniques including DNA profiling. In *Krishna Kumar vs*

*State of Hariyana*¹⁰ the court found that in the case of rape, analysis, DNA matching of accused on the source of victim are necessary for the complete proof of the incidence.

In one of the landmark cases, *State of Bombay v. Kathi Kalu Oghad*¹¹, the Supreme Court of India stated that the submission of a specimen of handwriting or signature prints of palm, finger or foot does not require consent and the submission of samples cannot be termed as violation of the article 20(3). In this consonance, one more remarkable judgment, *Selvi v. the State of Karnataka*¹², was made in which the court stated that if the technique is invasive, consent is required. In accordance with this judgement, narco-analysis, polygraph, and brain mapping strictly require the consent of an individual. In such cases, the court has no inherent powers to order an individual to submit his blood sample for the test. However, the court has power to order for collecting a sample for DNA tests in criminal cases rather than the civil cases. It was pronounced by the court, that a person cannot be forced to give samples and adverse inference cannot be drawn against a refusal. Contrary to this, an adverse inference can be made, if the parties deny producing relevant evidence under their possession, as per the provisions of sec. 114 of IEA (Goswami and Goswami 2018).

While, the *Bhabani Prasad Jena V. Convener, Secretary, Orissa State Commission for women*¹³ is another crucial judgment in which Supreme Court of India notably decided that "When there is an apparent conflict between the right to privacy of a person not to submit himself forcibly to the medical examination and duty of the court to reach the truth, the court must exercise its discretion only after balancing the interests of both the parties and on due consideration whether, for a just decision in the matter, the DNA test is eminently needed" (Law Commission of India, Department of legal affairs, Govt. of India 2017).

In the absence of specific DNA law, to deal with the issue of privacy and consent in the context of DNA test, the supreme court of India, in one of the paternity disputes (*Goutam Kundu v state of Bengal*), formulated guidelines that courts in India cannot order blood collection for DNA test during the course of matter; wherever applications are made for such requests in order to have roving inquiry, the request for blood sample collection cannot be entertained. There must be a strong prima facie case in that the husband must establish non-access in order to dispel the presumption arising under

¹⁰ AIR 2001 SC 2877

¹¹ AIR 2014 SC 932

¹² 2010 (7) SCC 263

¹³ AIR 2010 SC 2851

Table 1 Section 112 of Indian Evidence Act, 1872**112. Birth during marriage, conclusive proof of legitimacy**

The fact that any person was born during the continuance of a valid marriage between his mother and any man, or within 280 days after its dissolution, the mother remaining unmarried, shall be conclusive proof that he is the legitimate son of that man, unless it can be shown that the parties to the marriage had no access to each other at any time when he could have been begotten.

Section 112 of the IEA. The court must carefully examine as to what would be the consequence of ordering the sample collection for DNA test; whether it will have an impact on branding a child as an out-of-wedlock and the mother as an unchaste woman. No one can be compelled to give sample of blood for analysis (Law Commission of India, Department of legal affairs, Govt. of India 2017; Goswami and Goswami 2018). The of Law Commission of India recommended amendments in the IEA in its 185th report submitted to the Ministry of Law and Justice, Government of India.

Paternity and legitimacy: insights on Sec 112 of IEA

Paternity determination is an important aspect of personal identification. Paternity and legitimacy are the socio-legal issues that have been discussed in the judicial realm for a long time. Scientific advances must go along with the rules of law. Here, it must be taken into consideration that legitimacy is a legal phenomenon while paternity is associated with the genealogy of a child that may be determined by the DNA test. Legitimacy has been protected socially and legally both. Thus, this legal provision authorizes the father as a social father, while, the DNA test identifies only the putative father of the child (Patel et al. 2013).

In the provisions of sec 112 of IEA (as provided in Table 1), legitimacy has been regarded as conclusive presumption¹⁴. Legally, legitimacy and marriage are inter-linked. Conclusively, it can be stated that if the husband fails to prove non-access to his wife, the child will be considered legitimate of that couple. Maternity has not been questioned yet as the sec 112 does not address it. In many cases, the court observed that DNA profiling is scientifically accurate but it cannot escape from the conclusiveness of sec 112 and the presumption of legitimacy is conclusive proof, with few exceptions. The proof of adultery by a mother is also not enough to consider a child as out-of-wedlock. Contrasting court judgments are there on the question of paternity disputes and presumption of legitimacy of a child born within marriage or 280 days after marriage (Verma and Goswami 2014; Goswami and Goswami 2018).

Challenges in the practices of DNA testing/profiling: ethical concerns

The advances in genetics and the discovery of DNA seriously impacted the CJS. Before accepting the DNA test as evidence, it is crucial to check its credibility. The tremendous advances in science have created new maxims. These advances have also increased many ethical issues and other challenges. Inventions in medical sciences have created various new possibilities. The development of assisted reproductive technology (ART), bone marrow transplantation (BMT), and stem cell transplantation, blood transfusion are some of the distinguished inventions that have revolutionized the life of a common man (Batch et al. 1968; Gatti et al. 1968; Copelan 2006).

A patient with successful bone-marrow transplantation will possess a variation in their DNA profile, i.e., blood will possess the complete profile of the donor while the nail and buccal fluids are will contain a mixed DNA profile and hair will show an unmixed profile of the receiver (Pope and Chapman 2006). Aforesaid points are of paramount importance for DNA profiling and must be put into consideration from a legal viewpoint. Misuse of ART has created serious challenges in the identification of an individual for forensic purposes (Motluk 2011; Goswami 2015; Goswami 2016a).

Few cases of misuse of ART from Western countries are emphasizing the dire need for consideration over this issue. Many countries have formed regulations to prevent the misuse of ART and support the ethical practice of IVE. The reformed rules prevent the hiding of an adulterous act of a man in the name of ART by pleading as a sperm donor. In the case of State of Louisiana V. Farisad¹⁵, women inseminated with sperm from condom content and won the fatherhood of that child legally in light of DNA evidence (Dauber et al. 2004; Verma and Goswami 2014).

Previously, various ethical issues have been reported in connection with DNA. The concept of DNA theft, DNA fabrication, and other issues related to DNA databank are burning questions when applying DNA testing for the purpose of law. DNA theft has been now been declared as a crime in the UK (Laurie 2003). Any biological sample that facilitates DNA examination and the possibilities of false implantation of biological samples cannot

¹⁴ 1987 (1) SCC 624¹⁵ 694 SO 2d 1032 La.App. 5 cir.

be ignored. No technology can differentiate between the genuine samples and falsely/intentionally implanted samples to the crime scene. Often, DNA is believed to be originated from a true biological source. Few researchers have presented an astonishing approach, demonstrating the development of a specific/desired DNA profile from any biological sample. The techniques being used presently, such as PCR, as well as some recent advances, are also capable of developing a synthesized DNA in vitro. Frumkin et al. (2010) presented a way to differentiate between artificial and genuine DNA samples based on differential methylation patterns. Stealing of someone's DNA is not difficult where technology enables to develop DNA even from fingerprints, cigarette butts, key, etc. It has also been demonstrated DNA synthesis does not necessarily require the physical sample (Bolden 2011). In addition to the touch DNA, recovery of DNA from chewing gum has also been reported (Eychner et al. 2017; Tang et al. 2020).

In India, this issue seems to be untouched and undiscussed so far among scholars and researchers of the legal and the scientific community. Fortunately, such cases have not yet been reported in India, but their future perspectives cannot be ignored. Secondary and tertiary transfer of DNA has also posed a serious worldwide ethical concern. Furthermore, for the effective interpretation of DNA test results, the need for accepted standards to determine what constitutes a match has also been pronounced. In connection with the DNA databank, different ethical issues have been outlined. Ethical and legal problems may pose limitation in the potential of DNA testing (Guillén et al. 2000; Pugh 2008; Mansel and Davies 2012; Milot et al. 2013; Butler 2015a, b; García et al. 2017; Harshey and Srivastava 2018; Kunkel 2018; Machado and Silva 2019; Amankwaa 2020; Munir et al. 2020).

The need for other legislative reforms and DNA testing/profiling specific legislation

Since 1985, DNA technology has been serving the court of law across the globe. Many countries such as UK, USA, and Russia have enacted DNA legislation and reformed the rules and regulations to implicate scientific revolutions to the legal regimen. Some contradictions in existing Indian legislation strongly emphasize the requirement of legislative reforms along with the implementation of the DNA-specific bill. It is of utmost importance to balance between the conventional legal principles, newly enacted rules, and public interests (Milot et al. 2013).

Amendments in CrPC as Sec. 53-A and 164-A are not sufficient to deal with the issue. It has been reported that these amendments are restricted to rape cases and are not applicable in context of other offences. Furthermore, Sec. 293 of CrPC does not include experts from the

CCMB and CDFD. In order to claim the report by these scientists as evidence, they must be included in the CrPC (Goswami 2016b).

There are no provisions in the CrPC and in the IEA to conduct the blood collection for DNA test of a minor or his mother in case of maternity dispute, as evident from the case of *Bhoopala Subramaniam*¹⁶ where the court was not powered to order the blood collection and DNA test if the person was not willing to give the sample. While in case of *Swati Lodha vs state of Rajasthan*¹⁷, the Rajasthan High Court sentenced that taking a sample of venous blood can't be termed as the violation of Article 20(3) of the Constitution of India. The Supreme Court held significant statement over the admissibility and importance of DNA evidence in the dispute of *Sharda vs Dharmpal*¹⁸. Court clearly stated that the right to the privacy cannot be treated as an absolute right. If there are conflicts between the fundamental rights of the parties involved, the right which is more convincing towards the public morality would be taken into consideration (Adhikary 2007).

Further, the court stated that a matrimonial court may direct the person to undergo a medical examination and, it would not be the violation of right to privacy. This empowered the matrimonial court to direct the medical examination and take any action on the party that refused to submit themselves for the medical examination. Earlier, in contrast to the positive view, the Supreme Court of India had stated that no person should be compelled to undergo DNA test even though it is absolutely necessary for the decision of the case. This statement was given because the right for refusal to undergo the DNA test have been protected by the article 20(3) and 21 of COI that is right against self-incrimination and right to privacy (Adhikary 2007).

In the paternity dispute case of *Kantidev vs Poshiram*, the court decided that the scientifically accurate results of the DNA test are not enough to escape from the conclusiveness of the Sec. 112 and thus, the court admitted the scientific accuracy of the DNA evidence but did not consider this evidence for deciding the dispute in the light of Sec. 112 of IEA (Verma and Goswami 2014).

In the case of *Yasu vs Santh*¹⁹, the Kerala High Court had observed that there was special legal protection given to the status of legitimacy. In the case of paternity testing, if a male is excluded as the biological father of a child, it will discard the legitimacy of the baby, as well as the mother might be discriminated as the unchaste women.

¹⁶ 1959 Cr LJ 1087 MAD

¹⁷ 1991 Cr.LJ 939

¹⁸ 2003 (4) SCC 493

¹⁹ 1975 Ker Lt 533

Thus, this is another dilemma for the Indian legal regime to create equilibrium between the rights of privacy, rights of the baby and the husband. Law Commission of India has proposed the revision of Sec. 112 of IEA according to the recommendations of the Malimath Committee (Ministry of Home Affairs, Govt. of India Report (MHA, GoI) 2003).

Due to the lack of any DNA-specific legislation, various contradictions have arisen and these have posed problems for the judiciary. In the case of *Gautam Kundu vs the State of Bengal*, the Supreme Court of India formulated the guidelines for the DNA test. Interestingly, in many exceptional cases, the court has turned out from these guidelines. This was evident from a high-profile case of paternity settlement of *N.D. Tiwari vs Rohit Shekhar*²⁰. Rohit Shekhar himself claimed to determine his paternity. Here, Sec.112 of IEA 1872 was sufficient to decide paternity, but still, the court went through a DNA examination. Moreover, as per the above guidelines formulated by the Supreme Court, no person could be compelled to give his sample for any testing. Contrary to these guidelines as an exception, the high court itself ordered to take his sample forcefully for testing (Verma and Goswami 2014).

The guidelines formed by the Supreme Court in *Gautam Kundu vs state of West Bengal*²¹, (as discussed above) had put a question on fire. There is no doubt in the fact that DNA technology has a serious impact on the criminal investigation. These guidelines are formed to direct both the civil as well as the criminal disputes. But the provision of the guidelines may obstruct the criminal investigation and make it impossible to investigate the criminal case (Adhikary 2007).

Many developed countries have enacted specific legislation to implement science and technology more effectively for justice and to avoid the complex issues and other social problems in connection with the paternity testing. In the UK, Family Reforms Act 1969 empowered the courts to direct the withdrawal of blood in the cases of paternity disputes whenever needed. The Legislation of Sweden has made the blood collection for DNA testing compulsory for the settlement of the paternity disputes. Similarly, USA, Germany, Denmark, and Russia have also enacted their legislation and made DNA tests permissible in both criminal and civil cases. In the light of law and specific legislation only, the issues pertaining to the right to privacy, right against self-incrimination, etc. can be considered (Gupta et al. 2016; Joy et al. 2018).

To enhance the application of DNA technology for the forensic purposes, now, the concept of DNA databank

has been accepted by many countries (Santos et al. 2013; Jakovski et al. 2017; Guerrini et al. 2018). England was the first nation to establish its DNA Database 'NDNAD' in 1995. Later on, France and USA also established their DNA databases named as The Fichier National Automatisé des Empreintes Génétiques (FNAEG; in English- Automated National File of Genetic Prints) and Combined DNA Index System (CODIS) respectively (Kumar et al. 2016). The legal aspects of DNA practice are interlinked with the ethical and integrity issues. Forensic practices not only provide scientific evidence but also provide the answer to the question about the authenticity of the evidence (Chamber et al. 1997; Walsh 2005). Various ethical challenges have been reported in the past in context of the DNA databank (Cordner 2001; Mansel and Davies 2012; Wallace et al. 2014; Jakovski et al. 2017; Yadav 2017; Munir et al. 2020). These matters can only be dealt with the help of specific guidelines.

Recently 'The Criminal Procedure Act, 2022' has been enacted by the Parliament of India, which repealed the pre-existing 'The Identification of Prisoners Act, 1920'. This new act includes the major amendment regarding the nature of the measurements and samples which should be collected from the accused or convicted persons. The previous act only includes the collection of fingerprint and footprints, while the latest one includes the other biometric features as well as biological samples. The inclusion of biological samples itself supports the proposed DNA technology bill, in which the major source of DNA is biological materials collected from human individuals. The new act also iterates that, the police officers and prison officers have the complete authority to collect all of the measurements listed in the bill including the biological samples, without the permission of the Magistrate, which was included in the previous act. The increment of the powers of the law enforcement sector for the collection of biological samples will potentially catalyse the chances of the enactment of the DNA bill in near future.

Currently drafted DNA Bill should emphasize the need for establishment of DNA databank in India. To implicate the scientific advancements to the CJS and to deal with the issues pertaining to the Right to Privacy, self-incrimination, etc. several legal reforms and DNA-specific laws are needed. Specific guidelines for the collection, transportation, and analysis of the DNA samples are required to enhance its admissibility in the court of law (Srivastava et al. 2020).

Proposed DNA profiling bill: at a glance

The drafting of the DNA profiling bill for crime investigation began in 2003 for the first time. DNA Profiling Advisory committee was founded by the Department of Biotechnology (DBT), GOI to make recommendations

²⁰ *The High Court of Delhi, FAO (OS) No 547/2011*

²¹ *1993 SCR (3) 917*

on DNA profiling bill in 2006. This was followed by Human DNA Profiling Bill, 2007. This bill was criticized by NGOs, etc. as privacy concerns were not outlined. An expert committee constituted by DBT in 2013, pronounced over the issues about the bill. Privacy and security concerns again prevented this from being introduced in the parliament. It was 2018 when the Law Commission of India submitted its 271st report entitled 'Human DNA Profiling-A draft Bill for the Use and Regulation of DNA-Based Technology' (Hickok 2012).

The DNA Technology (Use and Application) Regulation Bill 2019 was introduced in the lower house of Indian Parliament (also known as *Loksabha*) in January 2019 and again in July 2019. This bill which included 10 chapters, aimed to identify missing people, children, victims, culprits, and unknown deceased people. Provisions for the DNA Regulatory Board, accreditation and organization of a DNA laboratory, DNA databank, the security of information, funding budget, penalties for the offences like disclosure of information, etc. were also well discussed and directed to ensure the future pathway of DNA profiling in India (The DNA technology (use and application) regulation bill 2019).

The proposed legislation authorizes a medical practitioner to collect intimate samples from living source. Staff trained for the sample collection is directed to collect non-intimate samples under the supervision of medical practitioner or molecular biology expert. The bill identifies a sample of blood, semen or any other tissue, fluid, urine or pubic hair, or a swab taken from a person's body orifice other than mouth; or skin or tissue from an internal organ or body part, taken from or of a person (living or dead) as intimate bodily substance. Further, handprint, fingerprint, footprint or toe print, a sample of hair other than pubic hair, a sample taken from a nail or under a nail swab taken from any part of a person's body including mouth, but not any other body orifice saliva or a skin impression are classified as non-intimate samples.

Current proposed DNA bill lists few matters in which DNA test may be conducted. According to the bill, offense under Indian Penal Code, 1860 in which DNA test may produce relevant results in the search of truth. Additionally, offences under special law i.e. The Immoral Traffic (Prevention) Act, 1956; The Medical Termination of Pregnancy Act, 1971; The Pre-conception and Pre-natal Diagnostic Techniques (Prohibition of Sex Selection) Act, 1994; The Protection of Women from Domestic Violence Act, 2005; The Protection of Civil Rights Act, 1955; The Scheduled Castes and the Scheduled Tribes (Prevention of Atrocities) Act, 1989; The Motor Vehicles Act, 1988 may be subject matter for the DNA test. Civil disputes not only limited to maternity or paternity determination but also includes ART-related issues (i.e., surrogacy,

in-vitro fertilisation and intrauterine implantation). Issues relating to transplantation of human organs (donor and recipient) under the Transplantation of Human Organs Act, 1994; issues relating to immigration or emigration and personal identification. The bill restricts the use of sample and genetic information for the purposes other than those scheduled matters.

As per the provisions of bill, DNA regulatory board is accountable for the confidentiality and security of the samples. Disclosure of information and unauthorized use of the samples is punishable offence under the bill. Imprisonment of three to 5 years and fine of one to two lac rupees is provisioned for the disclosure of information, destruction, alteration, and tempering with biological evidence.

This bill was referred by the Parliamentary Standing Committee on Science and Technology, Forest and Environment. The committee has underlined several issues associated with the DNA bill in its draft report that presents significant future perspectives of the DNA profiling bill. The committee observed that DNA profiling gives extremely sensitive genetic information which can be misused. India is the hub of cultural diversity where multiple casts and religions exist. Incorrect linking of criminal activities with particular community or cast may harm the social diversity and harmony. The report sincerely pronounced the need of clear provisions regarding the storage of DNA profiles, override of consent to ensure the privacy of an individual as a fundamental right as stated by the Supreme Court of the India in the verdict of *Justice K.S.Puttaswamy (Retd) vs Union Of India*²², quality assurance of forensic investigation, separate databases for civilians and criminals, cost-effective analysis, prior adaption of legislation of data protection bill to safeguard one's privacy.

Conclusions

The development of DNA technology has created new dimensions in criminal investigation. It has also provided significant corroborative scientific evidence to the criminal justice system. To satisfy the legal dogmas, contradictions, and applications of DNA technology in connection with the rapidly changing socio-economical concerns of Indian society, specific legislation and legal reforms are the need of time. The government of India is going to enact the DNA bill. The committees constituted for comments mainly propagated that the DNA profile contains sensitive genetic information that can be misused. This bill will definitely prove to be an effective key in the ethical practice of DNA testing as well as addressing the current legal issues by creating a balance

²² 2017(10) SCC 1

between conventional legal principles, human rights, and new scientific developments.

Abbreviations

ART: Assisted reproductive technology; BMT: Bone marrow transplantation; CCMB: Centre for Cellular and Molecular Biology; CDFD: Centre for DNA Fingerprinting and Diagnostics; CFSL: Central Forensic Science Laboratory; CJM: Chief Judicial Magistrate; CJS: Criminal justice system; CODIS: Combined DNA Index System; COI: Constitution of India; DBT: Department of Biotechnology; DNA: Deoxyribonucleic acid; FNAEG: Fichier National Automatisé des Empreintes Génétiques; Gol: Government of India; IEA: Indian Evidence Act; MHA: Ministry of Home Affairs; PCR: Polymerase Chain Reaction; RFLP: Restriction Fragment Length Polymorphism; SFSL: State Forensic Science Laboratory; STR: Short tandem repeat; UK: United Kingdom; UNICEF: United Nations Children's Fund; UNTCHI: University of North Texas Center for Human Identification; USA: United States of America.

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