Significance of DNA in Conviction of Rape Accused

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ABSTRACT

DNA is an abbreviation of Deoxyribo nucleic acid. It's an organic substance which is found in every living cell and gives an individual a personal genetic blueprint. It can be extracted from blood, saliva, semen, hair, bones and other organs of the body. DNA technique now enjoys legitimacy all over the world. The technique helps the identification of criminals on scientific lines. However, the technique requires great care and caution. DNA is essentially made up of amino acids and it's matched with so-called bases which provide the key to determining the genetic blueprint. Each and every cell in the human body has a sample of DNA. Presently, there is no concrete law, a specific law to govern the admissibility of forensic technique however the courts of law derives the validity of forensic technique from various provisions of Code Of Criminal Procedure and Evidence Act[1]. The paper will examine the role of DNA in a criminal investigation for a rape victim. In this paper, author tries to find out whether the forensic technique, especially in DNA profiling, helped to find out accused of a rape victim. It describes the main benefits and costs of the increasing role of DNA identification in the criminal justice system with special emphasis to India. We hope that the challenges of DNA technologies will be solved in future.

Keywords: DNA, Criminal Investigation, Forensic Technique, Rape, Evidence.

1. INTRODUCTION

In ancient times, the way in which a person died was deducted from the place and manner in which the victim was found. For example, a man found in a body of water would naturally have drowned, while a man found lying broken and bloodied along the side of a road would have naturally fallen and possibly been dragged by a horse. During the middle of the 12th Century, ancient Chinese were credited with being the first to attempt to define the difference between natural death and criminal intent. By the early 1800s, the recognition of fingerprint patterns was studied, but decades would pass before that observance was applied to criminal and personal identification. The discovery that fingerprints were unique to each individual and could provide identification of a particular individual, urged the state of forensic crime investigation to the forefront in 1788 when Dr. Nathaniel Grew published an illustrated anatomy book in which he claimed that "the arrangement of skin ridges is never duplicated in two persons."By the beginning of the 19th century, the study of hairs, fingerprints, and blood thrust the development of forensic investigation to new heights. Locard, the forensic professor at the University of Lyons, France, created the first crime laboratory for use by police and other law enforcement personnel [2]. Thus the forensic science eventually became an integral part of the administration of criminal justice.

Forensic scientists collect, preserve, and analyze scientific evidence during the course of an investigation. While some forensic scientists travel to the scene of the crime to collect the evidence themselves, others occupy a laboratory role, performing analysis on objects brought to them by other individuals [3].

Forensic DNA analysis was first used in 1984. It was developed by Sir Alec Jefferys, who realized that variation in the genetic code could be used to identify individuals and to tell individuals apart from one another. The first application of DNA profiles was used by Jefferys in a double murder mystery in a small England town called Narborough, Leicestershire in 1985. A 15-year-old school girl by the name of Lynda Mann was raped and murdered in Carlton Hayes psychiatric hospital. The police did not find a suspect but were able to obtain a semen sample.

DNA profiling is most commonly used as a forensic technique in criminal investigations to identify an unidentified person or whose identity needs to be confirmed, or to place a person at a crime scene or to eliminate a person from consideration [4].
DNA is the abbreviation of deoxyribo nucleic acid. It is the material found in cells that determines characteristics such as eye, hair, and skin colour. Each person’s DNA is different, except for identical twins. In Pantangi Balarama Venkata Ganesh v. State of Andhra Pradesh [5] a two-Judge Bench had explained to what is DNA in the following manner:

“Deoxyribonucleic acid, which is found in the chromosomes of the cells of living beings is the blueprint of an individual. DNA decides the characteristics of the person such as the colour of the skin, type of hair, nails and so on. Using this genetic fingerprinting, identification of an individual is done like in the traditional method of identifying fingerprints of offenders. The identification is hundred per cent precise, experts opine.”

This means that DNA can be used to accurately identify a perpetrator, similar to the way we use fingerprints. DNA evidence can be collected from blood, saliva, sweat, urine, skin tissue, and semen. That’s why it’s important to try to avoid bathing, cleaning your fingernails, or urinating until after the forensic exam has been performed. Now DNA analysis has become a common form of evidence in criminal trials. It is also used in civil litigation, particularly in cases involving the determination of Paternity of Identity.

We can say that DNA can be used to solve crimes in several ways. DNA profile generated from exhibits from a crime scene can be matched with DNA profile of suspects of either exclude the innocent or fox culpability of offender [6]. DNA is made-up of a double standard structure consisting of a deoxyribose sugar and phosphate backbone, cross-linked with two types of nucleic acids referred to as adenine and guanine, purines and thymine and cytosine pyrimidines. The most important role of DNA profile is in the identification, such as an individual and his blood relations such as mother, father, brother, and so on. Successful identification of skeleton remains can also be performed by DNA profiling. DNA usually can be obtained from any biological material such as blood, semen, saliva, hair, skin, bones, etc. The question as to whether DNA tests are virtually infallible may be a moot question, but the fact remains that such test has come to stay and is being used extensively in the investigation of crimes and the Court often accepts the views of the experts, especially when cases rest on circumstantial evidence [7]. More than half a century, samples of human DNA began to be used in the criminal justice system. Of course, debate lingers over the safeguards that should be required in testing samples and in presenting the evidence in Court. DNA profile, however, is consistently held to be valid and reliable, but of course, it depends on the quality control and quality assurance procedures in the laboratory. Close relatives have more genes in common than individuals and various procedures have been proposed for dealing with a possibility that true source of forensic DNA is of a close relative.”

Suspects can be traced by matching the DNA profiles of the crime exhibits with the profiles in the offenders DNA data bank. DNA testing is also used in resolving various civil disputes including parentage, immigration, and fraudulent sale of plant and animal products. During the last decades, many new and exciting innovations and technological advancements have taken place. Now, mt DNA, Y-STRs, and SNPs are also being added to forensic DNA testing. Nanotechnology-based DNA-chip is another development to improve speed and resolution of DNA evidence analysis.

DNA profiling (earlier called DNA fingerprinting) was introduced in 1984 by British geneticist Alec Jeffrey [8]. It was first used in catching and convicting Coin Pitchfork who raped and murdered two girls, one in 1983 and another in 1987. In 1987, the DNA fingerprinting was utilized as a tool for criminal investigation, to establish blood relations and trace medical history. Investigators would find "anonymous DNA" at the crime scene and compare it with the DNA of suspects for possible matches. The investigator would generally use a swab to collect bodily substances from a suspect's mouth to match it with DNA collected from the crime scene.

Since then, the science of DNA profiling has undergone developments and it will continue to do so in the future. It has now become a routine test in any forensic setting, and is in great demand in the process of criminal investigation and administering justice in criminal cases and civil disputes. Due to the extensive validation studies and challenges in courts, DNA is now considered a gold standard in forensic science.

As we all know that rape is a heinous crime which is perpetrated against humanity. It does not only ruin the life of the women (victim) but also gives a bad impact in the society. It destroys the physical and psychological composure of the women. In this crime, it is not easy to catch the accused because we are unable to find the direct evidence. Here the victim is also in trauma through her extracting of evidence is not an easy job. While on the other hand delayed reporting of cases is detrimental, on the other, sloppy investigation, inconsistent victim statements, hostile witnesses etc, are materials in the failure of prosecution in establishing the guilt [9].That’s why here DNA technology plays a vital role to get the evidence from this kind of crime. This is the elements which connect the accused with the offense. The presence of semen in the private parts of the woman, and /or the clothes of the victim may go a long way in establishing the guilt of the accused. Through which accused can be easily determined. So this article is mainly focus how DNA helps in criminal investigation for rape victim and how much it is admissible in court and where is the lacuna where it is not easy to get the perfect result from the DNA report cause of which many accused are easily escaped and even many false cases are lodged by the victim.

2. FORENSIC SCIENCE AND ITS STAND IN INDIAN CRIMINAL JUSTICE SYSTEM

Before delving more into the aspects of DNA it is crucial to know on which pedestal does the forensic science stand in the administration of criminal justice system in India. The Malimath Committee on Reforms of Criminal Justice System, along with other reforms also reported on the status of application of forensics in a criminal investigation. Among its suggestions were that the DNA experts should be included in sub section 4 of section 293 of the Code which speaks of Reports of certain Government scientific experts [10]. This was taken into account in the consequent amendment.
Further in the National Seminar on “Forensic Science; Its Use and Application in Investigation and Prosecution; was organised by this Committee National Seminar on “Forensic Science; Its Use and Application in Investigation and Prosecution; was organised by this Committee and the Bureau of Police Research and Development at Hyderabad on 27 July 2002, the committee observed that “There are virtually no facilities for training of Forensic Scientists in the country and they mostly learn on the job. It must be noted that a trained scientist is far more productive than several untrained or semi-trained hands. We, therefore, recommend that NICFS should take upon its shoulders the responsibility of imparting professional training to the scientific personnel. We also recommend that NICFS must expand and strengthen its core facilities in emerging areas such as forensic DNA, Forensic Explosives and Computer Forensics etc, and the Bureau of Police Research and Development at Hyderabad on 27 July 2002.”

3. DNA TESTING METHODS

Three methods are currently used to analyze DNA evidence [11]. While these methods are very reliable, sometimes results cannot be obtained or are inconclusive if the quantity of the evidence is insufficient to analyze or if the evidence has been contaminated or improperly preserved. The technology used in analyzing DNA evidence is increasing in sophistication and in its ability to distinguish individuals, so it may be possible to test evidence in the future in ways that are not possible today. The most common form of DNA analysis is called polymerase chain reaction (PC R). The development of PC R testing has greatly advanced the field of forensic DNA testing by increasing the success rate of the analysis of old, degraded, or very small biological evidentiary samples. PC R testing has allowed investigators to analyze evidence samples that previously could not be tested because the quality or the amount of starting material was insufficient for previous DNA analysis techniques. The PC R process works by taking very small amounts of DNA from biological evidence and making millions of copies of it. This process often referred to as PC R amplification, creates enough DNA to allow a laboratory analyst to generate a DNA profile. The process also allows laboratory technicians to analyze the degraded biological material. A group of 13 different locations is used for the analysis of evidentiary samples and to generate DNA profiles from convicted offenders for the CODIS database. Because of the capability of PC R testing to amplify very small quantities of DNA, extreme care must be exercised to prevent contamination when identifying, collecting, and preserving biological evidence. For this reason, investigators and laboratory personnel should always wear disposable gloves, use clean instruments, and avoid touching other objects when handling the evidence. The other two methods used to analyze DNA evidence are Restriction Fragment Length Polymorphism (RFLP) testing and PC R testing on DNA from the mitochondria of the cell. RFLP testing usually requires a sample that has 100,000 or more cells (such as a dime-sized bloodstain) and contains DNA that is not degraded or broken into smaller fragments. RFLP has been widely used since the late 1980s and is able to exclude wrongly accused individuals. PC R testing on DNA from the mitochondria of the cell is conducted on samples that are unsuitable for RFLP or PC R nuclear DNA testing (such as dried bones or teeth, hair shafts, or samples that contain very little or highly degraded nuclear DNA). Mitochondrial DNA testing is available only in a limited number of laboratories primarily because of the time it takes to perform the tests.

Interpreting Results of DNA Analysis in Criminal Investigation [12]

- **Inclusion:**
  When the DNA profile of a known individual (A victim or suspect) matches the DNA profile from the crime scene evidence, the individual is “included” as a potential source of that evidence.

- **Exclusion:**
  When the DNA profile from an individual (A victim or suspect) does not match the DNA profile generated from the crime scene evidence, the referenced individual is “excluded” as the donor of the evidence.

- **Inconclusive:**
  Inconclusive results indicate that DNA testing did not produce information that would allow an individual to be either included or excluded as the source of the biological evidence.

4. DNA PROFILING AND CRIME INVESTIGATION

DNA profiling technology, which is based on proven scientific principles [13], has been found to be very effective for social welfare, particularly, in enabling the Criminal Justice Delivery System to identify the offenders. Such tests relating to a party would definitely constitute corroborative evidence [14]. Appreciating the use and regulation of DNA based technology in judicial proceedings, particularly, identification of persons accused of offences under the Indian Penal Code 1860 (IPC) and other laws, identification of missing persons and disaster victims apart from its use in medical sciences; a need has long been felt to have a special legislation to regulate human DNA profiling. DNA analysis offers substantial information which if misused or used improperly may cause serious harm to individuals and the society as a whole. If DNA profiling is not misused then it helps a lot during a criminal investigation. DNA profiling has been of immense help in the following type of criminal investigations:

- Linkage of the criminal, the victim, the weapon of offense, the vehicle used in a crime, scene of occurrence etc through body materials,
- Identification of the culprit or the victim through body materials, including hairs
- Identification of the culprit from semen, semen stains or vaginal swabs in rape cases....
- Identification of the culprit through saliva left on glasses cigarettes, bitten skin etc
- Identification through urine and faecal matter...
- Identification of mutilated bodies through known and available body material
- False charges relating to rape and fatherhood
DNA technology as a part of Forensic Science and scientific discipline not only provides guidance to the investigation but also supplies the Court accrued information about the tending features of identification of criminals. The recent advancement in modern biological research has regularized Forensic Science resulting in radical help in the administration of justice. In our country also like several other developed and developing countries, DNA evidence is being increasingly relied upon by courts. After the amendment in the Criminal Procedure Code by the insertion of Section 53A by Act 25 of 2005, DNA profiling has now become a part of the statutory scheme. Section 53A relates to the examination of a person accused of rape by a medical practitioner. Similarly, under Section 164A inserted by Act 25 of 2005,[15] for medical examination of the victim of rape, the description of material taken from the person of the woman for DNA profiling is a must.

5. LEGAL PERSPECTIVE OF DNA TECHNOLOGY

As we all know that constitution is the backbone of our legal system so here we will discuss the constitutional perspective of DNA technology after that we will see other law relating to this technology.

Article -51- Fundamental Duties

The Constitution of India, by Article 51A (h) and (j), declares that, it shall be the duty of every citizen of India “to develop the scientific temper, humanism and the spirit of inquiry and reform”; and “to strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of Endeavour and achievement.” The Parliament is legislatively competent to make laws with respect to the Union agencies and institutions for professional, vocational or technical training, promotion of special studies or research, or scientific or technical assistance in the investigation or detection of crime and with respect to coordination and determination of standards in institutions for higher education or research and scientific and technical institutions [16]. The constitutional provisions take care of the scientific developments that may take place and may be put to use for the benefit of the people. The Constitution provides efficient scales for balancing between public and private interests and the Courts have put to use its provisions for an effective social engineering to protect both the cherished human rights recognized by the Constitution and the paramount public interest in a welfare State.

Article 20(3)

Articles 20(3) of the Indian Constitution provide that no person accused of any offense shall be compelled to be a witness against himself. Article 20(3) is based upon the presumption drawn by law that the accused person is innocent till proved guilty. It also protects the accused by shielding him from the possible torture during an investigation in police custody. What Article 20(3) contemplates is forcing testimony thereby incriminating oneself in a crime. Therefore police cannot forcibly extract a confession. The term witness in this clause means a source of information thereby incriminating self. But precondition to this is some sort of force or coercion. One cannot take advantage of his own wrong. Using DNA Technology for detecting the culprit is in no way against this right. In reality, it facilitates the advancement of Justice; anyhow it is different from confession provided that DNA test is carried under the guidance of Judiciary, which will ensure just, fair and reasonable procedure. In Raman Lal Bhogi Lal Shah Vs V.K. Guha [17] Supreme Court held that protection under Article 20(3) is only against the person being compelled to be a witness against himself. It doesn’t mean that he need not give information on matters, which don’t tend to incriminate him. The accusatorial system gives too much importance to the right of the accused. It doesn’t care about law enforcement if the accused is innocent then why he is refuge under Article 20(3), when subjected to a DNA test. In order to reach the right conclusion, one must see the right perspective.

In the case of State of Bombay v. Kathi Kalu Oghad [18], the Hon’ble Supreme Court considered the similar question in relation to Article 20(3) of Constitution of India and also re-examined some of the propositions laid down in the case of M.P. Sharma and Ors. v. Satish Chandra[19]. It is held therein that 'to be a witness' in relation to oral evidence means “imparting knowledge in respect of relevant facts by a person who has personal knowledge of a fact to be communicated to a Court.” It was further observed that Section 139 of the Evidences Act recognizes the distinction between producing a document and being a witness, for it provided: "a person summoned to produce a document does not become a witness by mere fact that he produced it and cannot be cross-examined unless and until he was called as a witness". In the said judgment, the Hon’ble Supreme Court, after considering various aspects, came to the following conclusions:

- 'To be a witness’ is not equivalent to 'furnishing evidence’ in its widest significance; that is to say, as including not merely making of oral or written statements but also the production of documents or giving materials which may be relevant at a trial to determine the guilt or innocence of the accused.
- Giving thumb impressions or impressions of foot or palm or fingers or specimen writings or showings parts of the body by way of identification are not included in the expression 'to be a witness'.
- To be a witness’ means imparting knowledge in respect of relevant facts by an oral statement or a statement in writing, made or given in Court or otherwise
- To be a witness’ in its ordinary grammatical sense means giving oral testimony in Court. Case law has gone beyond this strict literal interpretation of the expression, which may now bear a wider meaning, namely, bearing testimony in Court or out of Court by a person accused of an offense, orally or in writing.”

Article 21- Right to Life
Our Constitution being an organic document caters the need of an organic man with its omnipresence in every part of our lives. Fundamental rights are incorporated with a view to foster the development of man and to check state action in this field. Fundamental rights in themselves are not absolute, which is in consonance with jurisprudential ideology. So they cannot be stretched too far or else the legal system will be in problem. Under the garb of Article 21, the accused cannot be helped to free him. The concept of the predominance of the legal spirit as accepted by the general conscience of the common man and the intellect speaks that if there is a written law or even there if there is not written the law, such law must provide for justice which is actually manifested in action and not only on paper. So to be in line with a predominance of legal spirit, care must be taken not only of the interest of the accused but the interest of the victim and society at large. Therefore proper thought should be given while appreciating any form of evidence within the notion of the predominance of legal spirit.

The decision had also cited some foreign precedents dealing with the authority of investigators and courts to require the collection of DNA samples for the purpose of comparison. In that case, the discussion centered on the 'right to privacy'. So far, the authority of investigators and courts to compel the production of DNA samples has been approved by the Orissa High Court in Thogorani v. State of Orissa 2004 Cri L J 4003 (Ori).

DeemamShamji Pateli v. State of Maharashtra [20], who held that a person suspected or accused of having committed an offense cannot be forcibly subjected to a medical examination. It was also held that if police officers use force for this purpose, then a person can lawfully exercise the right of private defense to offer resistance.

It was the 37th and 41st Reports of the Law Commission of India which recommended the insertion of a provision in the Code of Criminal Procedure to enable medical examination without the consent of the accused. These recommendations proved to be the precursor for the inclusion of Sections 53 and 54 in the Code of Criminal Procedure, 1973 [21].

At this juncture the Explanation to Sections 53, 53A and 54 of the Code of Criminal Procedure, 1973 was amended in 2005 to clarify the scope of the medical examination, especially with regard to the extraction of bodily substances.

Section 53 Code of Criminal Procedure Act authorizes police officials to get a medical examination of an arrested person done during the course of an investigation by the registered medical practitioner. The explanation provides that Examination shall include the examination of blood, blood-stains, semen, swabs in case of sexual offences, sputum and sweat, hair samples and finger nail clippings by the use of modern and scientific techniques, including DNA profiling and such other tests which the registered medical practitioner thinks necessary in a particular case. But in the case of Ananth Kumar Naik v. State of Andhra Pradesh [23] the Court, while considering the scope of Section 53 of the Code observed that "Examination of a person by a medical practitioner must logically take in examination by testing his blood, semen, urine etc." The Court further observed that Section 53 of the code provides for use of such force as is reasonably necessary for making such examination. Therefore, whatever discomfort might be caused when samples of blood and semen are taken from an arrested person, would be justified under the provisions of Section 53 and 54 of the Code.

The impact of DNA profile, on the forensic investigation, has been referred, in Anil alias Anthony Arikswamy Joseph v. State of Maharashtra [24] wherein the Hon'ble apex Court, has held as follows:

Deoxyribonucleic acid, or DNA, is a molecule that encodes the genetic information in all living organisms. DNA genotype can be obtained from any biological material such as bone, blood, semen, saliva, hair, skin, etc. Now, for several years, DNA, the profile has also shown a tremendous impact on the forensic investigation. Generally, when DNA profile of a sample found at the scene of crime matches with the DNA profile of the suspect, it can generally be concluded that both the samples have the same biological origin. DNA profile is valid and reliable, but variance in a particular result depends on the quality control and quality procedure in the laboratory."

In the case of Jamshed v. State of UP [25] has also taken the view that though there is no specific provision under the Indian law permitting the taking of blood sample, yet, in criminal case, "examination of a person" includes an examination of any organ inside the body, and taking of blood sample also. It is observed that in modern society, the taking of blood could not be said to be something offensive or against the sense of decency and that there is nothing repulsive or shocking to the conscience in taking the blood sample. As such, even causing some pain in the process may be permissible under Section 53 of the Code.

Section 53-A was added vide the Code of Criminal Procedure (Amendment) Act, 2005 provides that an accused of rape can be examined by a medical practitioner, which will include the taking of bodily substances from the accused of DNA profiling. This amendment was brought to overcome the difficulty of the prosecuting agency to detect the serious offense of rape. This section is not ultra vires of the Constitution. Drawing of the blood sample for the purpose of civil proceedings without the consent of the party is not desirable. But the drawing of the blood sample for detection of the offense of rape wherein the investigating agency has to establish its case beyond a reasonable doubt cannot be termed as violation of Article 20(3) of the Constitution [26]. The offense of rape is a very serious offense and it is an offense against the society at large [27]. The Commission considered the draft Bill and based on its examination of the relevant issues, it came to the conclusion that merely amending the Code of Criminal Procedure, 1973, may not serve the purpose. In view of the scope of the use and misuse of human DNA profiling, it has been felt that it is required to be regulated by a special law with well-delineated standards, quality controls and quality assurance systems to ensure the credibility of the DNA testing, restricting it to the purposes laid down in the Act. Thus, there is a need to regulate the use of human DNA profiling through a standalone law of Parliament so that such use is appropriately regulated and restricted to lawful purposes only. The Law Commission while revising the draft Bill has also been conscious of the concerns raised by the Courts regarding appropriate use of DNA technology by making it necessary for the DNA testing centers to abide by the guidelines and standards which are listed in the Bill and the details thereof will be worked out in regulations.
DNA is not regarded as a conclusive piece of evidence, but can merely be an expert opinion used for the purposes of corroboration. So Sec 45 of The Indian Evidence Act 1872 makes the provision relating to the expert opinion. The opinion of the expert is not conclusive in nature unless and until he has been examined as a witness and the party affected by it has had the opportunity of cross-examining him. There are no tests as such laid down by law to determine how much experience or qualification a person must possess to be taken as an expert [28]. Expert evidence is “opinion evidence” and as a general rule, the opinion of a witness on a question of fact or of law is irrelevant [29]. A witness may testify only to facts, not to their effect or result, or to use conclusions based on those facts and he can give evidence only of facts, which he has directly perceived through his senses [30]. It is the function of the judge to form his own opinion on the facts stated. The opinion of witnesses possessing peculiar skills (as of experts) is an exception to this rule. It is important to note here that the opinion of an expert is not accepted just because he says so. He has to satisfy the court that his findings are unbiased and scientific. The duty of the expert witness is to furnish the judge with necessary scientific criteria for testing the accuracy of the conclusion so as to enable the judge to form his independent judgment by application of these criteria [31].

The report of an expert is not admissible unless he has been examined as a witness and the party affected by it has had the opportunity of cross-examining him. Further, a finding by an expert not supported by reasons has to be rejected [32]. Thus, the admissibility of an expert’s evidence is subject to certain checks, which are in furtherance of the basic ideas of justice.

6. RAPE AND ITS INVESTIGATION USING DNA TECHNOLOGY

Among all the crimes, sex related crimes are most barbarous and humiliating [33]. Rape in India received extensive media coverage after a fatal gang rape of a student in Delhi in December, 2012. It is important to look at the provisions of the criminal laws in India which provide for the justice administration in rape cases.

Before 3 February 2013, Section 375 of the Indian Penal Code defined rape as:

375. Rape. A man is said to commit "rape" who, except case hereinafter excepted, has sexual intercourse with a woman in circumstances falling under any of the six following descriptions:-

Firstly. — Against her will.

Secondly. — Without her consent.

Thirdly. — With her consent, when her consent has been obtained by putting her or any person in whom she is interested, in fear of death or of hurt.

Fourthly. — With her consent, when the man knows that he is not her husband, and that her consent is given because she believes that he is another man to whom she is or believes herself to be lawfully married.

Fifthly. — With her consent, when, at the time of giving such consent, by reason of unsoundness of mind or intoxication or the administration by him personally or through another of any stupefying or unwholesome substance, she is unable to understand the nature and consequences of that to which she gives consent.

Sixthly. — With or without her consent, when she is under sixteen years of age.

Explanation. — Penetration is sufficient to constitute the sexual intercourse necessary to the offence of rape.

Exception. — Sexual intercourse by a man with his own wife, the wife not being under fifteen years of age, is not rape.

The above definition excluded marital rape, same sex crimes and considered all sex with a minor below the age of sixteen as rape.

After 3 February 2013, the definition was revised through the Criminal Law (Amendment) Act 2013, which also raised the legal age of minor to eighteen.

375. A man is said to commit "rape" if he;— (a) penetrates his penis, to any extent, into the vagina, mouth, urethra or anus of a woman or makes her to do so with him or any other person; or (b) inserts, to any extent, any object or a part of the body, not being the penis, into the vagina, the urethra or anus of a woman or makes her to do so with him or any other person; or (c) manipulates any part of the body of a woman so as to cause penetration into the vagina, urethra, anus or any part of body of such woman or makes her to do so with him or any other person; or (d) applies his mouth to the vagina, anus, urethra of a woman or makes her to do so with him or any other person, under the circumstances falling under any of the following seven descriptions:

Firstly. — Against her will.

Secondly. — Without her consent.

Thirdly. — With her consent, when her consent has been obtained by putting her or any person in whom she is interested, in fear of death or of hurt.

Fourthly. — With her consent, when the man knows that he is not her husband and that her consent is given because she believes that he is another man to whom she is or believes herself to be lawfully married.
Fifthly. — With her consent when, at the time of giving such consent, by reason of unsoundness of mind or intoxication or the administration by him personally or through another of any stupefying or unwholesome Substance, she is unable to understand the nature and consequences of that to which she gives consent.

Sixthly. — With or without her consent, when she is under eighteen years of age.

Seventhly. — When she is unable to communicate consent.

Explanation 1.— For the purposes of this section, “vagina” shall also include labia majora.

Explanation 2.— Consent means an unequivocal voluntary agreement when the woman by words, gestures or any form of verbal or non-verbal communication, communicates willingness to participate in the specific sexual act:

Provided that a woman who does not physically resist to the act of penetration shall not by the reason only of that fact, be regarded as consenting to the sexual activity, Exceptions — 1. A medical procedure or intervention shall not constitute rape; 2. Sexual intercourse or sexual acts by a man with his own wife, the wife not being under fifteen years of age, is not rape.

Even after the 2013 reform, marital rape when the wife and husband live together continued not to be a crime in India. Article 376B of the 2013 law made forced sexual intercourse by a man with his wife – if she is living separately – a crime, whether under a decree of separation or otherwise, punishable with at least a 2-year prison term. Forced sex by a man on his wife may also be considered a prosecutable domestic violence under other sections of Indian Penal code, such as Section 498(A) as well as the Protection of Women from Domestic Violence Act 2005. The crime of sexual assault on a child, that is anyone below the age of eighteen, is further outlined and mandatory punishments described in The Protection of Children from Sexual Offences Act 2012.

All sexual acts between the members of the same sex, consensual or forced, remains a crime under Section 377 of Indian penal code, after the 2013 Criminal Law reform, with punishment the same as that of rape.

Research in the last few years has revealed new options for identification in criminal investigations [34]. The analysis of cellular biological materials for DNA has greatly enhanced identification possibilities of criminals. Semen, blood, vaginal secretions, saliva, vaginal epithelial cells, and other biological evidence may be identified and genetically typed by a crime lab. The information derived from the analysis can often help determine whether sexual contact occurred, provide information regarding the circumstances of the incident, and be compared to reference samples collected from patients and suspects.

In Nirbhaya case [35] there is an analysis of evidence pertaining to DNA by citing various judgements. How DNA is admissible to many rape cases it has been discussed in this case through various decisions.

In this case prosecution has given an argument that DNA is the abbreviation of Deoxyribo Nucleic Acid. It is the basic genetic material in all human body cells. It is not contained in red blood corpuscles. It is, however, present in white corpuscles. It carries the genetic code. DNA structure determines human character, behaviour and body characteristics. DNA profiles are encrypted sets of numbers that reflect a person’s DNA makeup which, in forensics, is used to identify human beings. DNA is a complex molecule. It has a double helix structure which can be compared with a twisted rope ‘ladder’. The nature and characteristics of DNA had been succinctly explained by Lord Justice Phillips in Regina v. Alan James Doheny & Gary Adams [36]. In the Nirbhaya case, the accused were convicted relying on results obtained by comparing DNA profiles obtained from a stain left at the scene of the crime with DNA profiles obtained from a sample of blood provided by the appellant. In the above context, with regard to DNA, the following was stated by Lord Justice Phillips: “Deoxyribonucleic acid, or DNA, consists of long ribbon-like molecules, the chromosomes, 46 of which lie tightly coiled in nearly every cell of the body. These chromosomes – 23 provided from the mother and 23 from the father at conception, form the genetic blueprint of the body. Different sections of DNA have different identifiable and discrete characteristics. When a criminal leaves a stain of blood or semen at the scene of the crime it may prove possible to extract from that crime stain sufficient sections of DNA to enable a comparison to be made with the same sections extracted from a sample of blood provided by the suspect. This process is complex and we could not hope to describe it more clearly or succinctly than did Lord Taylor C.J. in the case of Deen (transcript:December 21, 1993), so we shall gratefully adopt his description.

"The process of DNA profiling starts with DNA being extracted from the crime stain and also from a sample taken from the suspect. In each case the DNA is cut into smaller lengths by specific enzymes. The fragments produced are sorted according to size by a process of electrophoresis. This involves placing the fragments in a gel and drawing them electromagnetically along a track through the gel. The fragments with smaller molecular weight travel further than the heavier ones. The pattern thus created is transferred from the gel onto a membrane. Radioactive DNA probes, taken from elsewhere, which bind with the sequences of most interest in the sample DNA are then applied. After the excess of the DNA probe is washed off, an X-ray film is placed over the membrane to record the band pattern. This produces an auto radiograph which can be photographed. When the crime stain DNA and the sample DNA from the suspect have been run in separate tracks through the gel, the resultant auto-radiographs can be compared. The two DNA profiles can then be said either to match or not.”

In the United States, in an early case Frye v. United States [37] it was laid down that scientific evidence is admissible only if the principle on which it is based is substantially established to have general acceptance in the field to which it belonged.

In Santosh Kumar Singh v. State through CBI [38] which was a case of a young girl who was raped and murdered, the DNA reports were relied upon by the High Court which was approved by this Court and it was held thus:
“We feel that the trial court was not justified in rejecting the DNA report, as nothing adverse could be pointed out against the two experts who had submitted it. We must, therefore, accept the DNA report as being scientifically accurate and an exact science as held by this Court in Kamti Devi [39]. In arriving at its conclusions, the trial court was also influenced by the fact that the semen swabs and slides and the blood samples of the appellant had not been kept in proper custody and had been tampered with, as already indicated above. We are of the opinion that the trial court was in error on this score. We, accordingly, endorse the conclusions of the High Court on Circumstance.

In Krishan Kumar Malik v. State of Haryana [40], in a gang rape case when the prosecution did not conduct DNA test or analysis and matching of semen of the appellant-accused with that found on the undergarments of the prosecutrix, this Court held that after the incorporation of Section 53-A in CrPC, it has become necessary for the prosecution to go in for DNA test in such type of cases. The relevant paragraph is reproduced below: “Now, after the incorporation of Section 53-A in the Cr.P.Cw.e.f 23.06.2006, brought to our notice by the learned counsel for the respondent State, it has become necessary for the prosecution to go in for DNA test in such type of cases, facilitating the prosecution to prove its case against the accused. Prior to 2006, even without the aforesaid specific provision in CrPC the prosecution could have still restored to this procedure of getting the DNA test or analysis and matching of semen of the appellant with that found on the undergarments of the prosecutrix to make it a foolproof case, but they did not do so, thus they must face the consequences.”

In Rajkumar v. State of Madhya Pradesh [41] the Court was dealing with a case of rape and murder of a 14 year old girl. The DNA report established the presence of semen of the appellant in the vaginal swab of the prosecutrix. The conviction was recorded relying on the DNA report.

According to the report “India is Lacking in the Amount of Sexual and Violent Crime Cases that Utilize DNA to Link the Accused to the Crime Scene”, crime in India is seen to be on an upsurge, especially rape and sexual assault cases where the conviction rate has fallen from 49% to as low as 29% in the last three years (between 2012 and 2015) in Delhi alone, and over 1,37,458 rape cases still stand pending for trial across India [42]. The lack of scientific methods in investigations is hampering justice delivery and the need for DNA casework expansion in India is now increasingly critical and urgent to build conviction in such cases.

“India is simply not collecting enough DNA at violent and sexual crime scenes,” said Tim Schellberg, President, Gordon Thomas Honeywell Governmental Affairs (GTH-GA), a legal and policy expert of forensic DNA. “DNA is the world’s greatest crime fighting tool. Consequently, DNA should be aggressively collected, tested and compared to the accused. DNA testing is happening in India, but not nearly enough,” added Schellberg.

GTH-GA estimates that the United Kingdom completes DNA testing on over 60,000 crime scenes annually. India is over 13 times larger in population that the United Kingdom, yet GTH-GA estimates that India’s crime labs collectively complete DNA testing on less than 7,500 cases annually. This is a very low number.

Furthermore, when DNA is collected, it often goes into large backlogs due to India’s lack of DNA testing infrastructure. The pendency of the backlogs for sample testing in the FSL at Rohini is 5661 and for the one at Chanakyapuri are 458. GTH estimates that most of the backlog cases mentioned is likely DNA.

As per the statistics available on the website of Directorate of Forensic Science, Himachal Pradesh, the pendency of DNA cases has gone up. In January 2017, the pendency of cases was 605 and in June 2017 was 674, whereas, the average collection of DNA cases is around 30 per month and average disposal of 15 cases a month. This shows almost 50 per cent increase in pendency at FSL per month.

As per the NCRB data, more than 34,651 rapes were registered in 2015. On the contrary, the annual report of the Centre for DNA Fingerprinting and Diagnostics (CDFD) [43] available for the latest year 2015-16 shows that they have received 99 DNA cases specifically for rape from different states.

Due to lack of infrastructure appears to be a roadblock with thousands of rape cases piling up over the years. There are few laboratories and diagnostic centres in India with the requisite facilities to conduct DNA tests. All States have to rely on these labs to conduct the test and hence, investigation is seriously affected and a huge delay sets in. “Courts cannot deprive the accused and victim from their constitutional rights on the mere ground that FSL is overburdened. If state thinks that FSL is overburdened, it is the duty of the state to set up sufficient infrastructure. Such excuses cannot prolong the trial.” Saying so, the Sessions Court levied Rs. 10000 as fine on the Delhi Government and pulled up the police and Forensic Science Lab for failing to submit the DNA even after 15 months [45]. The lack of trained manpower to deal with DNA proves to an obstacle in this regard.

The procedures adopted at the level of the scientific laboratories should be standardized and uniform processes should be adopted in DNA probing to rule out possibilities of ambiguity or improper results. As is clear from few cases stated above, the courts could not safely rely on the DNA reports either because of contradictions, or absurd conclusions. Insufficient samples, improper methods of preservation, inordinate delays in examination, non-functionality of instruments etc. have been found to be major blocks in relying on the DNA evidence in courts. The very much lacuna in DNA report is that the opinion of the expert is not conclusive in nature, it is not conclusive in nature because there is a fear in the mind during the examination of whether any mistake is done or not but if we have sufficient infrastructure and we took this thing too seriously/precautionary way then this type of mistake might not be happened. We can take expert opinion as a conclusive proof.
7. CONCLUSION

There is a unanimity that medical and forensic evidence plays a crucial role in helping the courts of law to arrive at logical conclusions. Therefore, the expert medical professionals should be encouraged to undertake medico legal work and simultaneously the atmosphere in courts should be congenial to the medical witness.

This attains utmost importance looking at the outcome of the case, since if good experts avoid court attendance, less objective professional will fill the gap, ultimately affecting the justice. The need to involve more and more professionals in expert testimony has been felt by different organizations.

In, India, it is a common perception that lot of time and effort is required to record evidence and therefore by enlarge members of the medical profession does not like to involve in medico legal cases.

Some of the possible reasons put forward for this perception are:

- Undue time consumption;
- Repeated adjournments;
- Lack of work culture in the courts

If these above reasons were not found then the expert will more active to record the evidence these are some the reasons why the experts are not showing real interest in the case.

Even though the sources are multiplying, the use of DNA evidence is currently limited because much of what could be tested remains unrecovered and unanalyzed. The numbers are increasing, but of all sexual assault convictions for which DNA collection is legislatively mandated, samples were obtained from less than half of the individuals, and of the cumulative number of DNA samples obtained, only 20 percent have been processed.

The reasons for the lag in evidence recovery and processing are scarcity of law enforcement resources, lab backlogs caused by insufficient funding, and time-consuming and costly testing methods. Given the deadlines imposed by the courts, it is not possible to analyze all the potential evidentiary specimens submitted.

8. REFERENCES

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[13] Law commission of India, report 271
[15] Section 164A of Code Of Criminal procedure:. Medical Examination of the victim of rape
[18] 1961CriLJ856
[19] AIR 1954 SC 300
[22] MANU/AP/0220/1977
[28] Khushboo Enterprises v. Forest Range Officer AIR 1994 SC 120
[34] SC No. 114/2013 State Vs. Ram Singh and another.
[35] 1997 (1) Criminal Appeal Reports 369
[36] 54 App. D.C. 46 (1923)
[37] (2010)9SCC 747
[38] Kamti Devi v. Poshi Ram (2001) 5 SCC 311, it is held that the result of a genuine DNA test is said to be scientifically accurate.
[39] (2011) 7 SCC 130
[40] (2014) 5 SCC 353
[41] As per the data recorded by National Crime Records Bureau at the end of 2015
[42] According to the report submitted in April this year by Delhi Government to the Hon’ble High Court. Delhi High Court Case No - W.P. (C) 7927/2012 & W.P. (C) 7927/2012.
[43] http://www.cdfd.org.in