

Case Report

Medical laboratory sciences and lectures a veritable tool in forensic science: A comparative review study of rape in Nigeria

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Abstract

Rape is an age-long crime; its rapid identification is of utmost importance in criminal justice. Considering the high rape caseload in Nigeria and the required high-level expert investigations, the researcher explores the evidence in rape crime with a ranking based on easy availability at the crime scene using medical laboratory scientists (MLS). Search with the phrase: rape and evidence, evidence reliance, and common rape evidence conducted on Web of Science, ..., and ScienceDirect. The search outcome was discussed professionally by two groups comprising ten members each as Group-1 (MLS lecturers) and Group-2 (MLS laboratory). From the discussions, the matrix of evidence and sources were: Blood (Teeth bite and weapon injury), Saliva (mouth as drop of salivas and area leaked by mouth), Hair (Pubic and head hairs), Semen (Ejaculation), Fingerprint and Footprint (Contacts with the finger and foot), Sweat (Skin especially from the armpits), Fibre (Cloth) and skin cell (skin). Ranking from ease of availability posited Blood (2.2:10%), Saliva (6.2: 27.5%), Hair (5.8: 31.25%), Semen (2: 11.25%), Fingerprint and footprint (2.4: 13.75%), Sweat (1: 2.5%), Fibre (0.6: 1.875%) and Skin cell (0.175: 2.1875%) as percentage availability at the scene. The most available evidence is Hair and Saliva. It may be that their release is uncontrollable and not easily noticed. The Fibre is the least of all the evidence available for crime. Fibre may not drop depending on the material. Semen may be good evidence, but physical barriers used as protection make it less available evidence. The MLS's proficient analytical skills are supportive of the Jury.

1. Introduction

Rape, in most jurisdictions, is a type of sexual assault called intercourse which include others as sexual penetration, etc., carried out by a perpetrator against a victim who is incapable of valid consent [1-2]. Incapable of valid consent describes states of unconsciousness, incapacitation, intellectual disability, and one below the legal age of consent. In this situation, consent is not possible. In these cases, the question of consent is irrelevant, and any sexual activity represents a form of rape. As rape is now understood, a victim or rapist may be an adult of either gender or a child of either gender. Rapists use different forms of coercion to oblige the individual

to have sexual intercourse against their wish. Although rape can occur in same-sex, in the researcher's opinion, it is often the male against a female gender. In Nigeria, the notion of rape is being perpetuated merely by men against women and not vice versa [3].

Starting from 2014 to 2015, the percentage of children under 5 years old of age that got raped changed by 133% point. By the end of 2016, following the projection based on the first quarter of 2016, there will be a 281% change in the number of children under 5-years that would have got raped. From 2014 to 2015 percentage of children 6 to 12 years that got raped

changed by 55%. By the end of 2016, following projections based on the first quarter of 2016, there will be a 2% increase in the number of children 6 to 12 years that would have got raped. Also, from 2014 to 2015 percentage of children 13 years and above that got raped changed by 14%. By the end of 2016, following projections based on the first quarter of 2016, there will be a 28% increase in the number of children 13 years and above that have got raped [4]. Five years of age by research exertion are the most frequently raped.

The consideration in the past on the cause of rape was the unbridled sexual desire, but recent understanding put it as a pathological assertion of power over the victim. Rape has been reported virtually everywhere in the world [5]. Virtually all societies have had the dehumanizing impact of it. Rape has not featured strongly as a policy priority in the Nigerian system for the last two decades and, in many ways, has been engulfed by strong national and international attention on domestic violence, banditry, kidnapping, and terrorism. Rape, sexual violence, is a heinous and notorious crime [6]. Physically unattractive persons who have been victims of rape may question the saying that rape is physically impossible in certain groups (Fig. 1). It is forced, unwanted, and upsetting. Researchers theorized that rape is a respecter of nobody. It must not be neglected in any way and at any time.



Figure 1. A female Minor victim of rape (she was raped shortly after her first period and she became pregnant. Will I say nature is cruel?

Rape is not easy to measure statistically [7] and there is scanty information on rape [8]. The criminal justice system has been inept at dealing with rape, and a smaller percentage of rape are reported [9]. The Nigerian authorities at both federal and state levels have failed to address rape adequately. The rape menace among Nigerians is not a natural phenomenon where citizens are logically prone to perpetuate rape acts, but it is an act that the causes could be traced significantly to bad governance [10]. Indeed, a concomitant relationship between bad governance and a high rate of crime and poverty and vice-versa, exists [11]. The Nigerian governments are fun of curtailing issues, not treating or addressing them from the roots. As part of addressing the issue from the root, sex education needs to be incorporated into the school syllabus. Bad governance is seen as one of the major causes of the menace of rape in Nigeria, put in its opposite helps as one of the way out to the peril of rape in Nigeria [10]. Nigerian laws must be draconian in nature and should not give a soft landing to perpetrators. In this way, it became capable of dealing with the perpetrators of crime (rape). Worthy of mention is the exorbitant litigation cost confronting the victims of rape in court. It is a serious impediment in getting justice in the court as many victims are incapacitated by the cost of prosecuting the perpetrators which distracts the victims from seeking justice against the perpetrators [10]. All these are government factors causing many issues to be lingering for too long. Again States in the Nigerian federation that have child rights acts which seemingly are made to fight against all forms of child abuse, including rape, are neglected [6]. Therefore, necessitate the need for the promulgation of more effective and potential laws to tackle the menace of rape in Nigeria [10]. In this way, the rape menace could be eradicated in Nigeria. Eradicating crimes is always not a challenge provided the government is ready to truly deal with such crimes [10].

A variety of social issues (forced pregnancy, trauma and others) make it necessary in the present situation to reduce rape crime. Parts of the push to reduce rape are Jurist decision and dependable evidence as can be found in several cases of rape [12]. A standardized protocol for samples collection will ensure the collection of all would-be evidences in undistorted

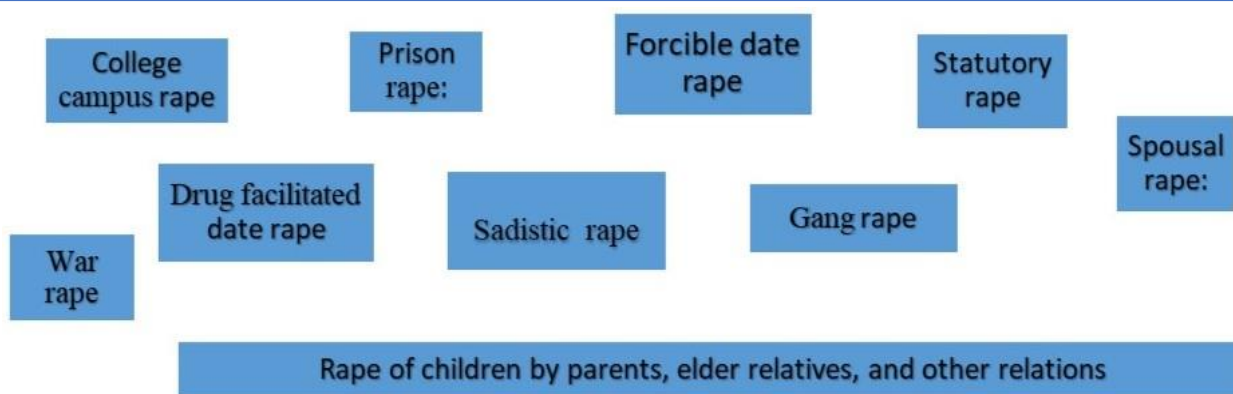


Figure 2. Box showing various selected types of rape.

state. Notably, analysis as in identifying, collecting and packaging of evidence in the rape scene and subsequent examination of evidence in laboratories are important because mistakes at any stage would impact the rest of the investigation. It is the responsibility of the medical laboratory to square away for the investigation. The presence of laboratory personnel in the stages ensures non-distortion of information for jurist decisions [12]. Inferior quality and inadequate medical evidence are attestable common barriers to the prosecution of rape cases [13]. It is part of the cause of unsatisfactory prosecution. Rape evidence must have colour that will straighten opinion or judgement. The ethics of Medical Laboratory guides against evidence distortion, Furthermore, the multidisciplinary nature of criminal investigation teams means that the quality of communication between Medical professionals, lawyers, and judges significantly influences how forensic medical evidence is used in rape cases [14]. The interpretation of biological evidence is a reliance upon expert experience and knowledge gleaned from Medical laboratory science. Medical laboratory scientists have the responsibility to perform a thorough examination and collect all evidence of potential value. The Jury as a body is empowered to receive evidence and give an unbiased decision, following submissions made. The jury interprets in accordance with the law and pronounce verdicts. The conceptual difficulties in tracking rapist leads to inequitable and inconsistent handling of rape by the criminal justice system. In jury trials, the judge and lawyers follow ethics to verify that all evidence submitted is legitimately acceptable and relevant to the case. The discrepancy could arise because the

victim’s story is inaccurate, because the medical report is superficial or lacks detail, incompletely describing the information and evidence collected [15]. In this case, Jury is exposed to various other extra-legal information, all of which can influence their decision making at trial [16]. Without the extra information, it is possible to make wrong decision. To avoid discrepancies between medical reports and legal reconstructions of rape crimes, it is crucial to provide expiratory information to all players. This will maximise the confidence of the victim [15]. The research opined that a ‘justice gap’ exists in rape crime, and Nigeria may not be free from rape crime. A smaller percentage of rape are reported [9]. The Nigerian authorities at both federal and state levels have failed to address rape adequately. The handling of the crime of rape is crucial because it sends a powerful signal to society [17]. The Government of the Federal Republic of Nigeria did not prohibit rape in the 1999 constitution. It expressly prohibits torture and other inhuman or degrading treatment. Rape is of various types (Fig. 2), though different concepts may exist on the types of rape. For example, sex is something a husband claims from his wife as his right at any time, negating spousal rape. Rape counts significantly, and the notion of consent is the defining feature of it. The consent may be problematical by language, law, context, sexual orientation, and culture [18]. There is the possibility of consent to sexual intercourse at the beginning with a later change of mind during the act. Also possible not to give consent initially and may later consent to it. In this situation, rape becomes problematic. The attendant consequences of rape are an increased risk of suicide [18], HIV infection [20], and murder and

others by the victims. There is a need to understand rape properly.

The rape victim may experience stimulation leading to orgasm, yet rape is always a crime. It creates confusion and shame [19, 21]. Rape can also occur by tricks. Medically, rape is described as unlawful sexual activity and involves sexual intercourse carried out by force or under threat of injury and against the consent, mainly of a female or with a person who is minor or incapable of valid consent [22]. In all these descriptions, consent is the keyword. However, false rape can occur [23], creating ambiguity.

To link Rapists and Victims together is challenging. However, in every rape, there is contact and trace evidence abounds [24-25]. On-site evidence collection from the rape scene and subsequent analysis present unbiased and dependable evidence, theoretically free from ambiguity, under work professional ethics. Laboratory investigations by professionally skilful Laboratory Scientists add to other evidence at the jurist's disposal. It is the research justification. Because they trained professionally, the results produced will be dependable. The rapid identification of crime is of utmost importance in criminal justice. However, it will be profitable for us to foreground this discussion with intellectual engagement on rape evidence. Considering the high rape caseload in Nigeria, the research explores the evidence in rape crime with ranking based on ease of availability at the crime scene using medical laboratory scientists (MLS). The research outcome will give the required improvement in linking victims of rape to perpetrators unambiguously. Again perpetrator found guilty by the court may receive treatment. It makes the work significant to the public. There are many options for treatment, and some are more successful than others. So punishment alone is not enough if we want to halt rape in reality and crime at large.

2. Materials and methods

2.1 Study design

The researcher reviewed existing literature on rape evidence that can be analyzed in medical laboratories, with the view to provide reliable tracking of the perpetrator and linking same to the victim. Empirical Searches on Journals with the phrase: 'rape and evidence,' 'evidence reliance,' and 'commonest rape

evidence' were conducted on five databases.

2.2 Search approach

The search approach was an iterative procedure to come up with wide-ranging keywords that delineated rape on academic documents having vital information on the subject matter. They selected databases (Criminal Justice Database, Web of Science, PubMed, Embase, and ScienceDirect) based on their quality, availability, information range, and discipline relevancy of scope coverage [26]. Words on included databases were searched on the title and abstract to exclude papers that did not meet the main emphases (targeted scope). Initially, the articles selected were two hundred (200). Out of the two hundred, 189 were downloaded articles. A total of 27 of the downloaded articles were screened out based on inconsistencies, conflicting information, and others. The remaining articles (162) progressed for use in rape evidence selections.

The search outcome was discussed professionally by two groups comprising ten members each: Group-1 (Medical Laboratory Scientist lecturers) and group-2 (Medical Laboratory Scientist in the laboratory). The evidence ranked on the ease of availability by the Laboratory Scientists following the disparity/concordant scores on each piece of evidence discussed. The disparity/concordance status was to decide on the degree of agreement following independent evidence ranking by the professionals.

2.3 Statistical analyses

Data generated were expressed in mean and percentage.

3. Results

Tables 1 and 2 are the result presentations of the rape evidence and percentage ranking per ease of availability based on eight pieces of evidence. The empirical search on rape evidence using the appropriate words on five databases gave the following matrices as trace evidence: Blood, Saliva, Hair, Semen, Fingerprint, Sweat, Fibre, and Skin cells (Table 1). The probable source(s) of the evidence were: Blood (Teeth bite and weapon injury), Saliva (mouth as drop of salivas and area leaked by mouth), Hair (Pubic and head hairs), Semen (Ejaculation), Fingerprint and Footprint (Contacts with the finger and foot), Sweat (Skin especially from the armpits),

Table 1. Rape trace evidence from empirical searched outcome

S/N	1	2	3	4	5	6	7	8
Sample	Blood	Saliva	Hair	Semen	Fingerprint and footprint	Sweat	Fibre	Skin cell
Source	Teeth Bite and weapon injury	Mouth, area leaked	Pubic and head	Ejaculation	Contacts with the fingers and foot	Skin	Cloth	Skin

Table 2. Evidence ranking based on easy of availability at the rape crime scene

S/N	Evidence	Scores(N=n/8)		Mean of scores	Concordant/Disparity Status	Percent
		Grp-1	Grp-2			
1	Blood	0.6	1.0	2.2	0.4	10
2	Saliva	2.3	2.1	6.2	0.2	27.5
3	Hair	2.6	2.4	5.8	0.2	31.25
4	Semen	0.9	0.9	2	0	11.25
5	Fingerprint and footprint	1.0	1.1	2.4	0.2	13.75
6	Sweat	0.3	0.2	1	0.2	2.5
7	Fibre	0.1	0.15	0.6	0.1	1.875
8	Skin cell	0.2	0.15	0.175	0.1	2.1875

Concordant / Disparity = Difference between Grp-1 and grp-2 Score.

Fibre (Cloth) and skin cell (skin).

The analyses and ranking as a function of the ease of availability, from the mean of the two groups were: Blood (2.2:10%), Saliva (6.2: 27.5%), Hair (5.8: 31.25%), Semen (2: 11.25%), Fingerprint and footprint (2.4: 13.75%), Sweat (1: 2.5%), Fibre (0.6: 1.875%) and Skin cell (0.175: 2.1875%) (Table 2). The most available evidences are hair and Saliva. The less available evidence is fiber and skin cells. The concordant status was best in Semen (0). The disparity status was highest in Blood (0.4), as in Table 2.

4. Discussion

Rape is forced, unwanted, and upsetting. Virtually all societies have had the dehumanizing impact of it. A report by Irwin and Rickert [27] stated that it occurs in all strata of society. Beauty may be the enticement and entrapment for rape, but minors, down to infants, raped are casting doubt on such thought as mentioned elsewhere. Rape became widespread in Nigeria in 2020 following the lockdown imposed to curtail the spread of the ravaging Covid-19 disease [28- 29]. The spread is unprecedented in history 30-31. Lagos, this time, recorded a 40% increase in rape [32]. Statistics across the nation show that the 15-45 age range recorded the following rape incidence: Lagos (759),

Kaduna (605), Kano (589), Katsina (565), Rivers (424), Borno (374), Anambra (372), Benue (354) and Niger (346) [33]. Though the research did cover a complete range of incidence in the nation, the great numbers of rape cases in Lagos, Kano, and Kaduna are due to higher human volumes.

Biological evidence with forensic interest found in a rape scenario is relevant to tracking sexual offences, and it provides more information than simply the suspect identification [14]. It aids in exonerating and providing links between rape criminal acts and rapists. While in the act of rape, it is likely that trace evidence of both biological and non-biological origin- semen, hair, skin cells, blood, and fabric may drop on other parts of the crime scene or the body of victims, hence the evaluation of the trace evidence as in Table 1. For a proper collection of this evidence, there is rape victim prevention from changing clothes, showering, or washing any part of their body after the rape. It is because the evidence may be found on clothing or bedding, under fingernails, or in the vaginal, anal, or mouth region, as the case may be.

The credibility of the rape evidence is essential during judicial proceedings. Evidence is a vital tool in rape crime, and it can become misleading if unprofessionally handled [34]. There is an urgent

need for professional involvement. Efforts in the present research made evidence 'infallible' via professionalism using Medical Laboratory Scientists who are actively practising according to ethics. The search outcome gave DNA and non-DNA evidence (see Tables 1 and 2), and many published studies have previously reported it [35-36]. DNA is the same for the person, whether from their salivas, skin tissues, hairs et c., they are the same. Most assured, DNA does not change for life, and no two individuals have the same DNA, identical twin inclusive, hence a powerful tool for linking the suspect to a crime or eliminating the suspect from suspicion or crime. Again, the stain may be invisible, and enough cells for DNA profiling is possible. Evidence can come from other parts of the crime scene or the body of the victim for evaluation (Table 1). For a proper collection of this evidence, there is rape victim prevention from changing clothes, showering, or washing any part of their body after the rape. It is because the evidence may be found on clothing or bedding, under fingernails, or in the vaginal, anal, or mouth region, as the case may be.

While in the act of rape, it is likely that trace evidence of both biological and non-biological origin- semen, hair, skin cells, blood, and fabric may drop. The credibility of the rape evidence is essential during judicial proceedings. While the jury is still out on court cases, Experts in the area may frequently ask for their input. It is a practice by Juri during judicial proceedings.

The On-site physical evidence in this present research was subjected to profiling and ranking based on ease of availability at the crime scene, according to expert proficient knowledge of MLS classroom and MLS practice. The ease of availability describes the possibility of finding these shreds of evidence at the rape crime scene. Though multiple variables affect the quality of evidence [24, 32], these variations are in consideration while ranking. The use of concordance and disparity took care of the variables. Hair and Salivas ranked highest, while Skin cells and fiber ranked lowest. The concordance or disparity status in the two groups is pivotal to determining the credibility of the results. In the present results, the concordance status is high, while the disparity is low in all the enumerated shreds of evidence as examined by the two professional groups. It makes the research

very informative.

The high 27.5 % ranking of salivary evidence may be due to involuntary emotional expression by the perpetrator while in the act, leading to uncontrolled droplets of saliva and kisses may be involved. The 31.25 % ranking of the Hair evidence might be from the push brush body contact (pubic hair and others) while on the act. It is unlikely that the public area is covered while on it. It is involuntary and not under control or will due to the pleasurable feeling of sexual intercourse coming from the perpetrator. The 1.875 % ranking of the Fibre evidence shows that the evidence is less available and may not be the key while collecting evidence. Semen is good evidence [38-40], but physical barriers used as protection make it less available evidence. It may be one of the thoughts of the professionals who did the ranking and possibly among other related professionals. This research limitation lies in the difficulty for scientists in a laboratory setting to recreate an environment in which people would typically rape for real-time shreds of evidence collection.

3. Conclusions

Rape is a persuasive problem in societies around the world. Nigeria is well on the road to being West Africa's rape capital. Stories abound of neighbours raping girls, uncles raping nieces, and even fathers raping daughters, especially during the lockdown, employers raping female employees, and so on. Fear of being raped is a constant companion of females. It is the stranger they face at every corner, every lane, every public space, and every hour. Rape is a rising issue, and the alarm about this crime is becoming increasingly difficult to ignore. It is one of Nigeria's most common crimes against females. This social melee is spreading like wildfire as cases of rape are daily, with less prosecution. It is a worrying situation that calls for a drastic measure as rape cases are becoming too frequent in our society. This evil act usually inflicts lifetime trauma and lifetime stigmatization on the victims. Rape as an epidemic requires a national emergency.

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Sole contribution, F.C.N.

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Availability of data and materials

All relevant data are within the paper and its supporting information files. Additional data will be made available on request according to the journal policy.

Conflicts of interest

The authors have declared that no competing interests exist.

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