

ASSESSING MEDICO LEGAL EVIDENCE AND LEGAL OUTCOME AMONG CASES OF SEXUAL ASSAULT (RAPE) IN ADDIS ABABA

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ABSTRACT

BACKGROUND: Sexual violence against women is a significant public health issue globally. The importance of medical evidence for decisions made by legal bodies is immense and is documented in high-resource countries. It is not clear what interventions work best in low resource countries like Ethiopia.

OBJECTIVES: To describe the medico legal findings of sexual assault cases and its association with legal outcome among victims of sexual violence cases in Addis Ababa.

METHODS: This study conducted a retrospective cross sectional descriptive study in the ten sub cities of Addis Ababa assessing a one-year record of sexual assault that were reported between January 1,2012 and 31 December, 2012. Samples of 224 sexual assault cases were drawn from 10 police stations in the sub cities. Data were collected from standardized police charts and court records. The OR and 95% CI estimates were also used to compare outcome predictors. Logistic regression was done to determine the association between medico legal finding and predictors of outcome with conviction.

RESULTS: The charge filing and conviction rates of the police-reported cases were 76.8% and 58.9%, respectively. The odds for conviction was more than six times more likely in unknown perpetrator and more than eight times more likely in cases where there was positive evidence of spermatozoa.

CONCLUSIONS: There was high charge filing and conviction rate. Sexual assaults by unknown assailant and visualization of sperm by direct microscopy were associated with conviction.

RECOMMENDATIONS: Qualitative study to survey police, prosecutors, physicians and judges regarding the usefulness of medical-legal evidence is recommended.

INTRODUCTION

Sexual offense is violence against women and significant public health issue in both the developed and developing world¹. Sexual assault is any sexual act performed by one person on another without the persons consent and it includes genital, oral or anal penetration by a part of the accused body or by an object. It may result from force, the threat of force either on the victim or another person, or the victim's inability to give appropriate consent^{1,2}. Rape is a psychologically devastating crime. The physical and emotional healing process is lengthy, complex, and, unfortunately, incomplete in many cases. Although no single event will complete the recovery process, the arrest and successful prosecution of the victim's assailant can be an important step³. The World Health Organization (WHO) recognizes that rape may be committed by a spouse, partner, or acquaintance as well as a stranger that men can be victims as well as perpetrators, and that coercion need not be physical².

The World Health Organization estimates that between 1% and 12% of women aged 15 or over have experienced sexual violence by a non-partner^{2,4}. In Ethiopia School based study in Addis Ababa and western Shoa zone showed the prevalence of completed rape and attempted rape among female students of 5% and 10%⁽⁵⁾. There have been great efforts for improvement on sexual assault care in this country which includes development of clinical management guidelines⁶.

Though expert medical evidence is widely used in rape cases, its contribution to the progression of cases

through the legal system and to legal case outcomes is unclear². Multiple studies have been published about risk stratification, injury pattern, psychological impact, and assailant profiles in cases of sexual assault^{7,8}, yet very few studies address the factors associated with successful legal prosecution of these cases⁹⁻¹². Thus, this study was conducted with the aim of describing the contribution of medical evidence to the legal outcome.

SUBJECTS AND METHOD

The study used a retrospective cross sectional descriptive study to determine the association between medico legal evidences and legal outcome. All sexual assault cases reported to the police from January 1 2012 to 31 December 2012 in the ten sub cities were analyzed. Addis Ababa the capital of Ethiopia has a total of 10 sub cities serving reported sexual assault cases. All sexual assault cases whose cases were closed, the suspects (assailant) were identified and that contain a record of a medical examination of the victim were included in the study.

Sample size was calculated using Epi Info (stat calc) for cross sectional studies Using 95% CI and assuming 5% degree of error and Power of 80% considering $P1 = \text{Conviction rate of 25\% among those with medico legal evidence (adult cases) - south African study (14)}$ and $P2 = \text{Conviction rate of 10\% among those without medico legal evidence (adult cases) - south African study (14)}$ assuming Risk ratio of 2.5 and Odds ratio of 3 to get Sample size 224.

A sample of 224 sexual assault cases were drawn from each sub cities using sampling with probability pro-

portional. This is to size based on the number of sexual assault cases seen in the respective sub cities during the study period. Individual cases were selected from the determined sample size with random number generator (Fig. 1).

Concerning operational definitions of incised wounds, lacerations, grazes, bruises on the whole body except the ano-genital regions were used to define non genital injuries. Those found on the Mons pubis, frenulum, clitoris, labia majora, labia minora,

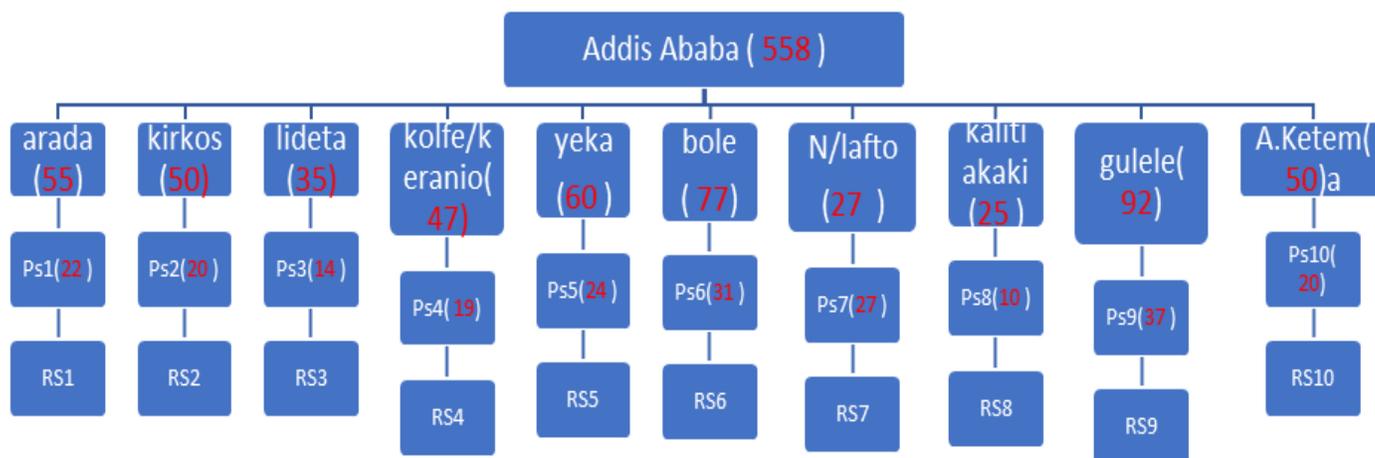


Fig 1. Addis Ababa ten sub cities

Data sources include standardized police charts used by police surgeons to examine women reporting sexual assault and court records. A standardized, structured pre-tested data extraction format which includes all the necessary variables in accordance with the objective of the study was prepared. The data extraction format has variables on the details of the complainant/victim (age, emotional state and previous consensual sexual relation), the circumstances of the sexual assault (when it occurred, use of weapons) and information on the suspect (age and relationship to victim), medico legal evidence and on the case outcome.

Documented findings of the medical examination, and any other reports were retrieved from the police dockets. Data was abstracted by ten trained data collectors (nurses/general practitioners).

perineum, fossa navicularis, hymen, vagina, clitoris, or anus were labelled as ano-genital injuries. The injuries recorded ranged from lacerations to bruising and redness or inflammation. Degree of injury was scored using clinical injury score criteria. Conviction and acquittal were used where the defendant has been found guilty and not guilty respectively.

Data was entered in to Epi Info version7 and exported to SPSS version 15.0 statistical software package for data cleaning and analysis. Frequency output and sorting was used to check missing values and outliers. The explanatory variables; victim suspect relationship, evidence of trauma and injury extent score were recorded further for analysis. Victim suspect relationship was dichotomized and recoded in to known and unknown assailant. Evidence of trauma was also dichotomized and recoded in to no evidence and positive

SCORE	CRITERIA
1=no injury	no documented signs or symptoms
2=Mild	Redness or tenderness only or minor injuries with no expected effect on physical function
3=Moderate	Injuries or injury expected to have some effect on function and/or more than redness-tenderness of the genitalia. Injury to the genitals with a skin break only - include genital injury that took the form of an incised wound, scratch, abrasion or laceration including anal rectal injuries.
4=Severe	Genital injury with active bleeding or scarring. Injuries requiring treatment (lacerations requiring suturing and wounds requiring dressings) and/or bruising of the head and neck expected to result in significant headache. Head injury with concussion and/or evidence of attempted strangulation and/or other major injuries (e.g. limb fracture, internal organ contusion)

evidence of trauma. Injury extent score 1 and 2 summed to mild injury and injury extent score 3 and 4 summed to severe injury for further analysis.

Data were analyzed using SPSS version 15. The P-value of 0.05 was taken as level of significance in comparison between outcome and explanatory variables. Descriptive statistics and summary measures

were employed to describe key study findings. The OR and 95% CI estimates was used to compare important outcome predictors. The association of medical-legal variables and assault characteristics with filing of charges (among the subset of cases in which a suspect was identified by police) and conviction (among the subset of cases in which charge were filed) was examined by using logistic regression. Data was presented with tables and graphs.

Two days intensive training was given for the data collectors. Consistency of filled data was checked by one supervisor at each sub city every other day. Five percent of the filled data was checked for accuracy by the supervisors. The principal investigator attended random record review sessions to monitor the data collection. Data was profiled to discover inconsistencies and other anomalies in the data and data cleansing (missing data interpolation) was performed.

Ethical clearance for the research was obtained from the Addis Continental Institute of Public Health (ACIPH) Institutional Review Board (IRB). Permission to review closed rape cases was obtained from the administrative bodies of sub cities (police) regionally, and at the stations. Permission to review court documents was obtained from the federal first instance court regionally. All data collected from police and medico legal records of victims were linked anonymously with legal outcomes using the codes provided for each record of victims. No personal identifier was recorded in the individual data sheet to keep anonymity of cases. Information collected from the study was stored in a file.

RESULTS

A total of 558 sexual assault cases were reported to the 10 sub city police administrations from January 1 2012 till 31 December 2012. A total of 224 closed sexual assault cases (40%) that met the study's inclusion criteria were selected from the ten sub city police administrations.

The mean age of victims was 16.3yrs (SD 8.9yrs) with age less than 19 comprising the majority (72.3%) of cases. Two hundred fourteen (95.5%) of all cases involved female victims. Previous consensual sexual intercourse was reported in 65 (29.7%) of cases. The mean age of assailants was 28.7yrs (SD 8.5yrs). In 195 (87.1%) of cases the assailant was known to the victim before the assault and 11 (4.9%) involved multiple assailants. More than half (63.8%) of victims reported vaginal, anal and/or foreign object penetration. One hundred thirty (58 %) of the cases reported to the police within 72 hours. Blunt object was the commonest weapon use reported in 21/224 (9.4%) of total cases and in 21/39(53.8) of cases where weapon was used. The main characteristics of the study population are presented in Table 1.

Medico legal evidence in the form of pictorial presentation of physical and ano-genital evidence (trauma gram) was available in 47 (21%) of cases. There was no evidence of trauma in nearly half 113 (50.4%) of cases. There was positive evidence of trauma in 111 (49.6%) of total cases (Table 1).

Table 1: Characteristics of patients, assailants and assaults among cases of Sexual assault occurring in Addis Ababa; January 1 2012 till 31 December 2012

Characteristic	No of cases (n=224)	% of cases
Sex		
Male	10	4.5
Female	214	95.5
Age		
<10	75	33.5
10-19	87	38.8
20-29	43	19.2
30-39	15	6.7
40-49	3	1.3
>50	1	0.4
Circumstance of assault		
Assailant known to victim	195	87
Assailant not known by the victim	29	12.9
Weapon used	39	17.4
Forced vaginal penetration	143	63.8
Motile sperm seen	22	9.8
Presence of STI	14	6.3
Presence of pregnancy	5	2.2
Rape reported within 72 hours	94	42
More than one assailant	11	4.9
Self-reported penetration	143	63.8
Evidence of trauma		
No evidence	113	50.4
Ano genital	68	30.4
Physical	5	2.2
Both ano genital and physical	38	17
1(no injury)	114	50.8
2(mild injury)	32	14.3
3(moderate injury)	42	18.8
4(severe injury)	36	16.1

Among those where there was evidence of trauma the commonest evidence stated was ano-genital injury which was noted in 68 (30.4%) of total cases and in 68/111 (61.3%) of cases where there was evidence of trauma. Non-genital physical evidence alone was noted in 5 (2.2%) of total cases and in 5/111 (4.5%) of cases where there was evidence of trauma and both physical and genital injury was noted in 38 (17%) of total cases and in 38/111 (34.2%) of cases where there was evidence of trauma. The most common documented genital injury was lacerations seen in 71 (66.4%) of cases, followed by bruising documented in 25 (23.4%) of cases. Hymen was reported to be the most common site of documented genital injury documented in 40 (37.7%) of cases. The lower extremity was the most common site of documented extra genital injury documented in 20 (46.5%) of cases. The most common documented extra genital injury was bruising seen in 23 (52.3%) of cases. The genital and physical findings of the study population are presented in Table 2.

Twenty-two (9.9%) of samples tested positive for the presence of sperm-semen. There was no reported DNA testing in the cases examined. Pregnancy as a result of the assault occurred in 5 (2.3%) cases. Sexual transmitted infection (STI) related to the assault was reported in 14 (6.3%) cases. The degree of injury was scored using the scoring criteria set and the degree of injury was rated as mild in 32 cases (14.3%), moderate in 42 cases (18.8%) and severe in 36 cases (16.1%) see Table 1.

Regarding the attrition of cases in the legal system, in 172 (76.8%) cases charges were laid, and in 132 of these the outcome was a conviction. For a conviction rate of 132 (58.9%) overall and 132 (76.7%) for cases in which charges were laid. No charges were laid in 52 (23.2%) of total cases.

Concerning the association of medico legal evidence with legal outcome, the charges were laid in 62 (54.9%) of the 113 cases with no injury. In all of the 32 (100%) cases with mild injury, in all of the 42 (100%) cases with moderate injury and all of the 36

Table 2. Site and type of ano genital injury among cases of sexual assault (rape) Addis Ababa; 2012

Site	Number	Type	No.
Hymen	40	Areas of tenderness	5
Labia majora/minora	27	Redness/inflammation	6
Perineum	17	Bruise	25
vagina	9	Laceration	71
Anus	12		
Other	1		
Total	106		10
			7

Table 3. Site and type of physical injury among cases of sexual assault Addis Ababa; 2012(n=111)

Physical (non-genital) injury			
Site	Number	Type	Number
Upper extremity	6	Tenderness	1
Lower extremity	20	redness/ inflammation	1
Trunk and abdomen including breast	12	bruise/graze	23
Head and neck	5	laceration	14
		incised wound	3
		other	2
Total	43		44

(100%) cases with severe injury. Of the 172 cases where charges were laid, the suspect was convicted in 27 (43.5%) of the 62 cases with no injury, in 28 (87.5%) of the 32 cases with mild injury, in all of the 42 (100%) cases with moderate injury and in 35 (97.2%) of the 36 cases with severe injury. Up on bi-variate analysis the following victim and assault characteristics (unknown assailant, weapon use, reporting of rape within 72 hours, positive evidence of trauma, severe injury extent score and visualization of sperm by direct microscopy) were associated with conviction at a *P* value of less than 0.05 (Table 4).

The variables associated with the case outcome at a *P* value of less than 0.05 were entered into the logistic regression model. After adjusting the variables for possible confounding with multiple logistic regression analysis the only variables found to be associated with conviction were unknown assailant, reporting within 72 hours and visualization of sperm by direct microscopy (Table4). The odds for conviction was more than six times more likely in unknown perpetrator and more than eight times more likely in cases where there was positive evidence of spermatozoa.

Table 4: Logistic regression model for factors significantly associated with conviction in sexual assault cases for which there was an identifiable Suspect, Addis Ababa;2012 (n=224).

Factor(variable)	Conviction		Unadjusted regression(COR)		Adjusted Regression(AOR)	
	No	Yes	Odds ratio	95% CI	Odds ratio	95% CI
Relation with the victim						
Known assailant	91(46.7%)	104	1.00		1.00	
Unknown assailant	(53.3%)		24	3.27-183.65	6.57*	1.25-34.57
	1(3.9%)	128				
	(96.6%)					
Weapon use						
No	90(48.6%)	95	1.00		1.00	
Yes	(51.4%)		17.53	4.10-74.85	3.47	0.65-18.43
	2(5%)	37				
	(94.9%)					
Time of reporting rape						
>72 hours	88(67.7%)	42	1.00		1.00	
<72 hours	(32.3%)		47.14	16.22-137.00	0.06	0.03-0.28
	4(4.3%)	90				
	(95.7%)					
Evidence of trauma						
No evidence	87(77%)	26	1.00		1.00	
Positive evidence	(23%).5		70.94	26.14-192.49	0.05	0.01-0.17
	5(4.5%)	106				
	(95%)					
Injury score						
Mild injury	91(62.3%)	55	1.00		1.00	
	(37.7%)		127.4	17.22-42.17	0.41	0.06-2.73
Severe injury	1(1.3%)	77				
	(98.7%)					
Detection of sperm						
No	91(45%)	111	1.00		1.00	
	(55.1)		17.22	2.27-130.45	8.7*	2.19-34.58
Yes	1(4.5%)	21				
	(95.5%)					

*- significant association

DISCUSSION

This study was undertaken to determine whether injury documented by a physician and circumstances of the assault is associated with legal outcome in cases of sexual assault. There was high charge filing and conviction rate. Sexual assaults by unknown assailant and visualization of sperm by direct microscopy were associated with conviction.

Very few studies address the factors associated with successful legal prosecution of risk stratification, injury pattern, psychological impact, and assailant profiles in cases of sexual assault. A recent review found 35 studies exploring the association, all but two from high-income countries, with only two studies from the United States and one from Canada and one from South Africa finding an association. Many of the studies were very small and out dated, which influenced the analyses performed and power thereof⁽⁷⁻¹⁴⁾. A minority (some report <10%) of women report sexual assault of those that negotiate the police process, only a minority will come to a court hearing^{8,15-17}. It is thought that the courts still rely upon medical evidence, in particular evidence of genital injury to 'prove' the rape¹⁸⁻²⁰.

This is one of the first studies that used a more refined measure of injury extent on the basis of a detailed review of police and court records to link medical findings in Ethiopian sexual assault cases to legal outcomes.

Record of emotional state of the victim of 67.9% in this study is low when compared to studies done in South Africa where emotional state of the victim was

recorded in of 89-92% of cases⁽¹⁴⁾. Weapon use in sexual assault cases ranges from 12% to 27%¹⁰. This is consistent with the findings in this study of 17.4%. Trauma gram of 21% in this study was very low compared with studies done in Canada and America with more than 90% of cases having trauma gram in the medical record^{10,11}. The proportion of cases with observed genital injury (30.4%) in this study was higher than reported in previous studies of 24% but lower than proportions reported in recent south African studies of 39-42%¹⁴. This might be explained by the fact that toluidine blue and colposcopic examination was performed in the recent studies, thereby increasing the detection rate of observed genital injury. Nevertheless, our finding confirms previous research suggesting that visible genital trauma is relatively uncommon in sexual assault and observed genital injury is absent in more than 50% of cases of sexual assault¹⁶.

The frequency of sperm-semen positivity (9.9%) in this study is low compared with other studies that report 13% to 17% incidence of spermatozoa with unstained microscope and 50% incidence with Prostate-specific antigen staining methods¹⁰⁻¹². The fact that microscopic evidence alone was used in this study might explain the decreased incidence of spermatozoa detection highlighting the low sensitivity of the tests used in this study. Other possible reasons that include time delays in presenting for examination, douching and bathing after an assault need further studies. No DNA test for matching was done in all cases in this study. There have been significant advancements made in the field of DNA matching. It is likely that these advancements will increase the signif-

icance of spermatozoa detection and result in an increased emphasis on its importance during prosecution¹².

The charge filing and conviction rates (76.8% and 58.9%, respectively) of the police-reported cases seen over the one-year study period is higher than findings from other studies in the United States and Scandinavian literature^{10, 11}. The overall conviction rate, using total number of cases as the denominator, was high in this study (58.9%) than studies by Helweg-Larsen and Pentillä and Karhunen (20%) and cases series reported by Rambow and associates (19%) in 1985⁽¹²⁾. This might be explained by the fact that only closed cases were reviewed in this study which might result in selection bias and also many of the earlier studies are based on data collected in the 1980s might suggest that two decades of legal reforms may affect prosecution and conviction.

At the crude level the odds for conviction in this study was high for unknown perpetrator. Perpetrators who used weapons and cases where the rape was reported within 72 hours. Reporting within 72 hours was associated with positive sperm/seminal detection in this study as 22% of cases in this study have positive sperm/seminal detection when reported within 72 hours while no positive sperm/seminal detection occurred when cases were reported after 72 hours¹³. Weapon use was associated with conviction in this study. Weapon use or use of force is important because it directs the examiner to look for specific injuries or potential areas of injury. This was evidenced in this study that there was positive evidence of trauma

in 94.9% of cases when weapon was used as compared to 40% when weapon was not used, making the odds of positive evidence 27 times more likely when weapon was used than when weapon was not used (OR= 28.8, 95% CI 6.5-118.7).

In this study the odds of conviction were also high in cases where there was evidence of trauma, severe injury score and positive evidence of spermatozoa at crude analysis. Prior studies investigating an association between legal outcomes and trauma found on physical examination after a sexual assault have produced mixed results. Prior retrospective case series found that evidence of trauma after a sexual assault was associated with a successful legal outcome. However, different study found no relationship between trauma on physical examination and legal outcome¹².

Of the studies which showed positive association between medico legal evidence and legal outcome, two of the studies were hospital based while two of the studies from United States and South Africa. In contrast, were population-based study where there is no hospital selection bias and therefore, the results have great internal validity.

The study in South Africa showed an association between documentation of ano-genital injuries, trials commencing, and convictions in rape cases¹⁴. Its findings are of particular importance. This is because they show the value of good basic medical practices in documentation of injuries, rather than more expensive DNA evidence, in assisting courts in rape cases in developing countries. It is notable that in a quarter of child cases where there was a conviction there were

no documented injuries, which was also the case in 10% of adult cases¹⁴. These data confirm that the presence of injury is not essential for a conviction in rape cases in South Africa.

The crude association between convictions with genital findings suggests the need to increase the time devoted to document micro trauma of the genital region by any available means. After dichotomizing the injury score in to mild and severe a gradient association was seen as cases move from mild to severe as was evident in that the odds for conviction was 127 times more likely in severe injury than mild injury (OR=127, 95% CI- 17-42).

After adjusting for possible confounding variables, the odd for conviction in this particular study was maintained only for unknown perpetrator and positive evidence of spermatozoa. The odds for conviction was more than six times more likely in unknown perpetrator and more than seven times more likely in cases where there was positive evidence of spermatozoa. One of the interesting findings in this study was the significance of the relationship between the victim and the offender. The victim's knowledge of the assailant was a significant independent factor for conviction. In contrast to one previous study that showed a positive correlation between known assailant and legal outcome¹³ this study found positive association of conviction with unknown assailant. The positive association of conviction with unknown assailant in this particular study is explained by the fact that evidence of trauma was present in 96.6% of unknown assailant. As compared to 42.6% when the assailant

was known making the odds of positive evidence of trauma more likely for unknown assailant than known assailant (OR=38, 95% CI- 5-283). The positive association of conviction with a stranger assailant has been well documented in studies that showed a positive correlation between a stranger as the assailant and legal outcome⁷. Studies have demonstrated that women are reluctant to pursue legal action if the assailant was known and if no injury occurred^{7,8}. The significant association between sperm-semen positivity and conviction is consistent with the few previous studies focused on this issue⁸. The significant positive associations of positive evidence of spermatozoa with conviction after adjusting for a number of possible confounding factors and assault characteristics is an important step in confirming the value of documenting evidence of spermatozoa in the forensic examination of sexual assault victims.

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