

Five Years Data of Vaginal Swab Examination on Sexual Assault Cases in West Java Top Referral Hospital, Indonesia

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Abstract

Background: Vaginal swab test is one of the way to prove that penile penetration has occurred by detection of spermatozoa or seminal fluid components in vaginal fluid of sexual assault victims. It is also used for detecting sexually transmitted infection (STI) in the victims and identifying perpetrators' DNA. The objective of this study was to describe vaginal swab examination result on sexual assault cases in Dr. Hasan Sadikin General Hospital, Bandung so it can be used as an evaluation material for the management of sexual assault cases and a reference for subsequent researches related to sexual assault.

Methods: Descriptive study was carried out using medical records and visumetreperium of sexual assault victims who underwent vaginal swab examination at Dr. Hasan Sadikin General Hospital, Bandung from 2010 to 2014. Of 62 medical records which met the inclusion criteria, 3 were excluded. A total of 59 medical records were included as study subjects. Data taken were victims' age, sexual assault's time, examination time, penile penetration and intra-vaginal ejaculation history, also vaginal swab and STI examination result. The data were processed and presented using a frequency distribution table.

Results: Spermatozoa were found in 13 cases (22.03%). Spermatozoa were found at latest 96 hours since assault. None of the victims was detected with STI.

Conclusions: The successful rate of Spermatozoa detection by conducting vaginal swab in Dr. Hasan Sadikin General Hospital, Bandung is 22.03%. Spermatozoa can be detected even 72 hours post assault.

Keywords: Seminal fluid, sexual assault, spermatozoa, vaginal smear, vaginal swab

Introduction

Sexual assault is all forms of action or words with unwanted sexual connotations or the forcing of an individual to partake in any activity that goes against their sexuality.¹ According to the data from Indonesia's National Commission on Violence against Women (*Komisi Nasional Anti Kekerasan Terhadap Perempuan*, Komnas Perempuan) in 2013, there were 5,626 sexual assault cases on Indonesian women. These figures have not been yet an accurate depiction of the real total of occurrences due to high number of underreported cases.²

In reported sexual assault cases, forensic examination will be conducted to gather evidence that can be used in the court, either to support or to overrule the allegations of

sexual assault.³ One of forensic examination's components is vaginal swab examination aimed to prove that penile penetration has occurred by detecting the perpetrators' spermatozoa or seminal fluid components in victim's vagina. Vaginal swab is also taken for identifying perpetrator and detecting sexually transmitted infection (STI) on the victims.¹ Vaginal swab examination usually consists of microscopic observation accompanied by acid phosphatase (AP) test. More advanced testing involves prostate-specific antigen (PSA) or semenogelin (Sg) assay.^{1,3} Deoxyribonucleic acid (DNA) testing is done for perpetrators' identification purpose.⁴ Sexually transmitted infection examinations are done to detect *Trichomonas vaginalis*, *Chlamydia trachomatis*, and *Neisseria gonorrhoea*.^{1,3} In Dr. Hasan Sadikin General Hospital Bandung, as one

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of West Java Top Referral Hospital, vaginal swab examination only consists of cytological observation of vaginal smear that shows the presence of spermatozoa and pathogens including *Trichomonas vaginalis*, also the condition of vaginal epithelial cells and vaginal normal flora.

There are no fixed procedures regarding the management of sexual assault victim but a brief clinical forensic guideline on obstetric and gynecologic cases from the Department of Legal and Forensic Medicine is available. The purpose of this study was to describe vaginal swab examination results on sexual assault cases in Dr. Hasan Sadikin General Hospital Bandung from 2010 to 2014.

Methods

This study was a descriptive quantitative study with cross-sectional approach. This study used medical records and *visum et repertum* from the Department of Legal and Forensic Medicine, the Obstetrics and Gynecology Polyclinic, and the Emergency Department of Dr. Hasan Sadikin General Hospital, Bandung from January 2010 to December 2014. The data collected were age of the victims, time of sexual assault, time of examination, history of penile penetration, history of intra-vaginal ejaculation, vaginal swab examination results in the form of spermatozoa presence and morphology and the results of STI test.

The sequence of examinations on sexual assault cases in Dr. Hasan Sadikin General Hospital, Bandung were as following: anamnesis was done followed by physical examination, and swabs of vaginal fluid were collected and smeared on microscope slides by a specialist or resident of Obstetrics and Gynecology Department, in either the outpatient polyclinic or the Emergency Department. The slides were then sent to the Anatomic Pathology laboratory to be observed under a microscope with Papanicolau staining. Afterward, if the victim had brought wise request from the police, they were referred to the Forensic Science Department to have a *visum et repertum*.

This study used a total sampling method due to the small number of cases. The inclusion criteria in this study were female patients who experienced sexual assault and underwent vaginal swab examination. Subjects were excluded when the medical records or the *visum et repertum* and/or the vaginal swab examination results were absent. From 62 medical records which met the inclusion

criteria, 3 were excluded due to the absence of vaginal swab examination result. Therefore, a total of 59 medical records were included in this study as study subjects.

The data were processed and presented using a frequency distribution table. This study was approved by the Health Research Ethics Committee of Dr. Hasan Sadikin General Hospital, Bandung.

The results of STI test were found in 24 medical records. The test was conducted by microscopic evaluation on vaginal swabs in Papanicolau staining to identify *Trichomonas vaginalis* but the tests for detecting *Chlamydia trachomatis* and *Neisseria gonorrhoea* were not carried out. The results were all negative (100%).

Results

The characteristics of study subjects were described in this study (Table 1). The age

Table 1 Characteristics of Sexual Assault Victims Who Had Undergone Vaginal Swab Examination

Characteristic	N (%)
Age* (n= 59)	
0–14 years old	21 (35.59)
15–24 years old	29 (49.15)
25–44 years old	9 (15.25)
Span of time between incident and tests	
0–23 hours	26 (44.07)
24–47 hours	12 (20.34)
48–72 hours	6 (10.17)
>72 hours	15 (25.42)
Penile penetration	
Yes	38 (64.41)
No	6 (10.17)
Unknown	8 (13.56)
No data	7 (11.86)
Intra-vaginal ejaculation	
Yes	7 (11.87)
No	13 (22.03)
Unknown	18 (30.51)
No data	21 (35.59)

Note: *The total of months (1–11) and the total of minutes and seconds (1–59) are rounded to the lower value

Table 2 Spermatozoa Test Results Based on the Span of Time Between Incident and Testing* and Morphology

Characteristic	0-23 hours	24-47 hours	48-71 hours	>72 hours	Total
	N (%)	N (%)	N (%)	N (%)	N (%)
Positive					
Intact	5 (8.47)	2 (3.39)	-	-	7 (11.86)
Only head	-	3 (5.09)	1 (1.69)	2 (3.39)	6 (10.17)
Negative	21 (35.6)	7 (11.86)	5 (8.47)	13 (22.04)	46 (77.97)

Note: *The total of minutes and seconds (1-59) are rounded to the lower value

categories for study subjects were classified according to the United Nations guidelines on age classification for the victims of criminal cases. The majority of victims were 15-24 years old (49.15%) and were examined in less than 24 hours after the incident (44.07%). Cases with unknown penile penetration and/or intra-vaginal ejaculation represented the victims who could not recall or were not aware of the details of incident. The absence of history of penile penetration and/or intra-vaginal ejaculation in their medical records was classified as no data.

From 59 cases, spermatozoa were positive in 13 cases (22.03%) and 46 cases (77.97%) were negative. There were two cases (3.39%) with the finding of spermatozoa after 72 hours -incident which were specifically at 78 and 96 hours (Table 2). Spermatozoa with tails were no longer found 48 hours post-incident. Spermatozoa motility was not stated in the examination results. This study also described spermatozoa detection result based on the

history of penile penetration and intra-vaginal ejaculation (Table 3).

Discussion

The majority of victims were in the age of 15-24 years old (49.15%) followed by the age of 0-14 years old (35.59%). Those age categories represented children, teenagers, and young adults.⁵ Previous studies mentioned that those age groups are easily victimized due to low physical strength, vulnerability to threats, or lack of access to and knowledge about health or law facilities to disclose the incident they had experienced.^{6,7} However, the subjects for this study were only victims who underwent vaginal swab examination, that the particular theory cannot be strengthened using this data. The data showed that vaginal swab examination was mostly done on children and teenagers, because the victims often has no cognition about the occurrence of penile penetration and/or ejaculation or uncooperative during

Table 3 Spermatozoa Detection Results Based on Patient Admission with Penile Penetration and Intra-vaginal Ejaculation

Characteristic	Detected	Undetected
	N (%)	N (%)
Penile penetration		
Yes	9 (23.68)	29 (76.32)
No	-	6 (100)
Unknown	2 (15.38)	6 (84.62)
No data	2 (28.57)	5 (71.43)
Intra-vaginal ejaculation		
Yes	2 (28.57)	5 (71.43)
No	-	13 (100)
Unknown	5 (27.78)	13 (72.22)
No data	6 (28.57)	15 (71.43)

anamnesis. Therefore, no penetrations and/or ejaculations were admitted but the physical examination results indicate a suspicion of penetration occurrence like signs of trauma on the victim's genitals and the presence of blood or lacerations on the hymen.^{1,8}

Majority of victims reported the incident and examined themselves in a period of less than 24 hours but there were still some victims who delayed their report, even until months or years after the incident. This delay can hinder examination result because quality and availability of evidences on the victim's body will be more optimal if taken in less than 24 hours and decrease drastically after 72 hours.^{1,6,7,9} A lot of factors were contributed to the delay in reporting such as the victim's age, the familiarity between the victim and the perpetrator, the occurrence of penetration, and also psychological factors, such as fear of the perpetrator's threats or social stigma.⁸

There was no different number of spermatozoa between the victims examined less than 24 hours and in 24–48 hours. There were 2 cases (3.39%) with spermatozoa finding 72 hours post-incident which were specifically at 78 and 96 hours. Spermatozoa with tails were no longer found 8 hours post-incident. This result showed a similarity to the previous studies which discovered that spermatozoa can be found even 72 hours post-incident with a maximum time period of 120 hours; intact spermatozoa can be found at a maximum of 26 hours.^{9,10} Sperm motility can also be used as an indicator of the occurrence of recent sexual assault, because motile sperm can only be found within 6–12 hours after incident.¹⁰

Admission of penile penetration is one of the main indicators to perform vaginal swab examination. This study found that the majority of victims who underwent vaginal swabbing had admitted the occurrence of penile penetration as the spermatozoa or seminal fluid can serve finding can be a solid proof for the victim's admission.⁹ A vaginal swab examination would be still done even though there were non-admission of intra-vaginal ejaculation because, the victim may be not aware of the ejaculation occurrence.^{11,12} Some victims, mostly children, only admitted digital penetration, but vaginal swab examination was still conducted because there were other incidents that may involve penile penetration or there were difficulties for the victim to recall the entire chronology of the incident because of lack of understanding of the whole situation and post-incident psychological trauma.¹³

Spermatozoa were found in 23.68% of victims who admitted penile penetration and 28.57% of those who divulged intra-vaginal ejaculation. The successful rate of spermatozoa detection in few studies was only 15–45%.^{9,14,15} It is to be noted that failure to detect semen or spermatozoa does not mean that sexual contact did not occur.³ Some literatures mentioned that spermatozoa cannot be found because (i) the perpetrator did not ejaculate, (ii) the span of time between the incident and the examination was long, (iii) the victim had cleaned her vagina after the incident, (iv) the collection and handling of samples was incorrect, (v) the examination process was ineffective, (vi) the perpetrator has a zoospermia or aspermia, (vii) the perpetrator used condoms, (viii) or the victim had bacterial vaginosis that spurs the immune system activity and increases the rate of sperm degradation.^{12,16,17}

To increase the successful rate of detection, a site of swabbing plays an important role. Vaginal swabs should be taken on posterior fornix (high vaginal swab) as well as on vaginal wall (low vaginal swab), because posterior fornix often becomes a site of seminal fluid pooling.¹ An alternative of vaginal swabs is to examine cervical swab, considering that spermatozoa lasts longer in the cervix (maximum of 179 hours).¹⁰ It is also possible to take extra-genital swab to detect spermatozoa in the external genitalia, anticipating extra-vaginal ejaculation.¹² An alternative of the smear technique can be also done, to extract the swabs before smearing it onto a microscope slide. This technique can increase the detection of spermatozoa as much as 6–7%.⁹

Aside from spermatozoa examination, AP test is a primary examination that can be done to detect seminal fluid in the vaginal canal, especially in forensic field. Acid phosphatase is an enzyme produced by the prostate, is found on high levels in the seminal fluid, and can be positive in absence of spermatozoa under the microscope.¹⁰ Semenogelin or PSA test detects seminal fluid and has higher sensitivity and specificity than AP test. However, the fast rate of degradation and decreased activity of these substances leads to ineffectiveness of the test to detect seminal fluid after 24–48 hours postcoitus.¹⁶

Vaginal swab can also be used as a specimen for male DNA isolation from sperm cells to provide solid identification of the perpetrator.³ The most common method used at the moment is the short tandem repeats analysis (STR)

using a DNA sequencer. The analysis result of the vaginal swab specimen was then matched with the DNA database or the suspect's DNA.⁴

Results of sexually transmitted infection test were obtained in 24 medical records. Microscopic observation on vaginal swab was done to identify *Trichomonas vaginalis*. Other non-STI-causing bacteria or fungi were not recorded in this study. No victim was detected with *Trichomonas vaginalis*. This was in conjunction to other studies that discovered the prevalence of *Trichomonas vaginalis* in sexual assault victim (0–19%).^{13,18} However, negative test results did not necessarily indicate a lack of infection as STIs could take between 3 days and 3 months of incubation period.¹ Sexually transmitted infection examination provides more medical than legal use. The conducting of STIs is still debated. In adult victims, STIs might be preexisting; it can be used as a defense by the alleged perpetrator^{3,19} but in children and pre-pubertal victims, preexisting STIs is rare, so the presence of a STI, especially the same STI as in the alleged perpetrators, might be used as an evidence to support the sexual assault charges.³

Limitation of this study included the possibility of information bias from victims' anamnesis and lack of information written in some medical records. Twenty one medical records could not be accessed due to inaccessible storage of medical records dated before 2014 from Emergency Department of Dr. Hasan Sadikin General Hospital, Bandung.

It can be concluded that the successful rate of spermatozoa detection in Dr. Hasan Sadikin General Hospital, Bandung is 22.03%. Spermatozoa can be detected even 72 hours post assault. There is a need to establish a fixed procedure regarding sexual assault cases management and further training for healthcare workers on management of sexual assault cases to achieve constant improvements in quality of care and evidence collection. Anamnesis, physical examination, and the writing of medical records should be done as thoroughly as possible. Time of incident, history of penetration and ejaculation should be obtained to provide a clear basis for the next diagnostic examination. Spermatozoa examination should be conducted even 72 hours has passed. The use of rapid test for PSA or Sg is also recommended for sexual assault cases due to the tests' high sensitivity and specificity, easy to use, and fast determination of the result.²⁰ The DNA examination is especially very useful in identifying the perpetrator for the prosecution of suspect.³ The lackness of

this examination is the cost that is considerably expensive. Other STI examinations can also be done based on individual needs. Improvements on medical records filing and storage will be a huge benefit for further research and legal purposes. Hopefully, Dr. Hasan Sadikin General Hospital, Bandung can become an integrated center of management for sexual assault cases.

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