VISUAL INSPECTION WITH ACETIC ACID AND PAP SMEAR FINDINGS IN HIV POSITIVE WOMEN ATTENDING MBAGATHI DISTRICT HOSPITAL

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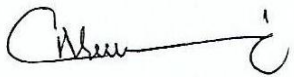
A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF DEGREE IN MASTERS OF SCIENCE IN CLINICAL CYTOLOGY AT THE UNIVERSITY OF NAIROBI

DECLARATION

I affirm that this proposal is my original work under the Supervisors' guidance listed below and has not been presented to the University of Nairobi or any other learning institution.



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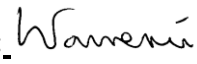
Signature:  **Date: 28/10/21**

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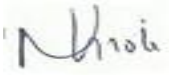

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DEDICATION

My wife, Mary Waithiegeni, children Gabriel Macharia, Cecilia Kiyo, Delivce Ndegwa, my father Joseph Macharia and mother Cecilia Kiyo, and my Sister Martha Wanjiku encouraged me the entire period.

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I thank God for this far he has brought me. He has been the rock of my salvation (Psalms 62, verses 7). I am grateful to the executives of health, the County government of Embu, former CEO Embu level 5 hospital Dr. Moses Njue and the Current CEO of Embu level 5 Hospital Mr.Nyagah for allowing me to Pursue my MSc. Degree in clinical cytology. Special thanks to my former supervisor, Mr.Eliud Njau, and the Current one, Mr. Steve Kimachu, for releasing me to school.

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ABBREVIATIONS AND ACRONYMS

AGC	Atypical Glandular cells
ASCUS	Atypical squamous cell of unknown significance
ASC-H	Atypical squamous cell cannot exclude HSIL
CIN	Cervical Intraepithelial Neoplasia
CCC	Comprehensive care Clinic
CC	Cervical Cancer
DPX	Distyrene plasticizer xylene
EA	Eosin Azure
EIA	Enzyme Immunosorbent Assays
FSW	Female sex workers
HPV	Human papillomavirus
HSIL	High grade squamous intraepithelial lesion
HANA	HIV Associated Non-AIDS
HAART	Highly Active Antiretroviral Therapy
IARC	International Agency for Research on Cancer
KNH	Kenyatta National Hospital
LSIL	Low grade squamous intraepithelial lesion
LMICs	Low and middle income countries
MTRH	Moi Training and Referral Hospital
N /C	Nuclear to cytoplasmic ratio

O.G.	Orange Green
PI	Principal Investigator
PLWH	People Living With HIV/AIDS
QC	Quality control
RC	Required concentration
RTWG	Research Technical Working Group
SOP	Standard operating procedure
SCC	Squamous cell carcinoma
SIL	Squamous intraepithelial lesion
TBS	The Bethesda system
VIA	Visual inspection with acetic acid

ABSTRACT

Cervical cancer is one of the most frequent cancers among women in Kenya and the most frequent cause of cancer deaths in resource-poor countries. About 0.5 million new cases are diagnosed each year globally, and about 0.3 million women die from this disease. Cervical cancer, caused by persistent infection with high-risk human papillomavirus (HPV), is potentially preventable through primary prevention by HPV vaccines and by secondary prevention through screening by a variety of methods. Visual inspection with acetic acid (VIA) has been used alone as a "screen and treat" approach and may give false-positive results.

Objective: The purpose of this study was to describe visual inspection with acetic acid and cytological findings in HIV-positive women.

Design: This was a descriptive cross-sectional study

Settings: Comprehensive care clinic, Mbagathi District Hospital, Nairobi.
Study population: HIV positive women attending the Mbagathi District Hospital
Sample size: Seventy-five HIV-infected women attending the Mbagathi District Hospital.
Methodology: Permission for the study was obtained from KNH-UoN/ ERC, Nairobi Metropolitan Services, and Mbagathi District Hospital. Seventy-five HIV-infected women were recruited into the study after meeting the inclusion criteria and a questionnaire was used to gather clinical and social demographic data. A qualified nurse collected seventy-five cervical smears from all the participants, followed by visual inspection with an acetic acid test. The cervical smears were stained with the papanicolau stain and examined microscopically. Analysis of the data was done using IBM SPSS statistics 26.

Results: Out of the 75 women in the study 69(92%) had negative VIA results. Visual inspection with acetic acid was positive in 1(1.3%) and suspicious in 5 (6.7%). The prevalence of cervical intraepithelial lesions in women infected with HIV was 22.7%. High false-negative results by VIA was noted in this study.

Conclusion:

The prevalence of cervical intraepithelial lesions in women infected with HIV was 22.7%.

High false negative results by VIA was noted in this study

Recommendations:

- Based on findings from this study HIV positive women ought to be screened using papanicolau and VIA tests.

CHAPTER 1.0

1.1 **INTRODUCTION**

Although cervical cancer is a menace to the health of women worldwide, it is easily preventable through early identification of pre-cancerous lesions to prevent the transformation to invasive cervical cancer(1). There are effective methods put in place to prevent cervical cancer, including HPV vaccines, cervical smear screening, VIA, and HPV testing. However, implementation and affordability remain challenging in most developing countries(2). Although these methods are in place, cervical cancer has continued to increase, causing a lot of suffering in women. Among the many cancers affecting women in Kenya cervical cancer is the second cancer causing morbidity and mortality in women(3). The government has put measures to alleviate cervical cancer, including primary and secondary prevention of cervical cancer.

The HPV vaccine has been introduced and licensed as primary prevention in Kenya so that young women can be vaccinated before their sexual debut(4). Women in Kenya have continued to suffer due to cervical cancer because the vaccine is expensive and not affordable. Cervical cancer has been complicated by the HIV epidemic in Kenya, becoming a threat to the health of HIV-positive women(5). The high incidence of cervical cancer, poor prognosis, and immune suppression due to HIV infection poses a significant challenge to women's health in Kenya(6). HIV-positive women have reduced CD4 T-cells, which is vital for resolving HPV infections(7). Studies suggest that 70% of cervical cancer cases are etiologically associated with HPV strains type 16 and 18(8–10). HIV-positive women are more vulnerable to the risk of high risk HPV, and prolonged HPV might result in squamous intraepithelial lesions and the transformation to cervical cancer.

A research study on predictors of cervical cancer screening among Kenyan women had a limitation because of scarcity of archived information on the frequency of cervical cancer screening and the methods applied to screen the disease (11). The gap identified on predictors of cervical cancer screening led the PI to studyand describe Pap smear findings and VIA findings in HIV-infected women attending Mbagathi District Hospital. Pap smear findings and VIA findings have been described and classified according to the Bethesda system of reporting pap smears (12). The study was conducted at Mbagathi District Hospital because of its strategic area. The facility neighbors Kibra slums, where women engage in activities including prostitution, female sex

workers, homosexuality, multiple sexual partners, and casual sex, resulting in STDs, including HIV and HPV infections to earn a living(13).

CHAPTER 2.0

2.1 LITERATURE REVIEW

2.2 : Epidemiology of cervical cancer

Cancer is a significant global burden, with an estimated 18.1 million new cases and responsible for 9.6 million deaths in 2018(14). Although there are frequent cancer types associated with women, cervical cancer is the fourth most common cancer globally, with 570,000 newly diagnosed cervical cancer cases annually(15). GLOBOCAN 2018 suggests that approximately 600,000 new cases of cervical cancer occur annually worldwide, with 300,000 deaths. Cervical cancer remains a significant public health concern, making it the most frequent cause of cancer incidence and mortality in women worldwide. The rise of cervical cancer is noted, particularly from 529,000 in 2008 to 570,000 in 2018.

In Kenya, the situation is not different. Cervical cancer is the second most common cancer in women and a frequent cause of death in women(3). Cervical cancer has been complicated by the rise of HIV(16,17). The study on epidemiology of cervical squamous intraepithelial lesions in HIV infected women reported an increase of squamous intraepithelial lesion, the precursor for cervical cancer among HIV positive women(18). A study suggests that women whose immunity is low due to HIV infection are 2.7 times likely to develop cervical intraepithelial lesions(19–21). Pre-cancerous stages or pre-invasive precursor lesions are interrupted before translating to cervical cancer. Therefore, the urgent need for Pap smear tests in health facilities.

The study on patterns of cervical lesions among 100 women living with HIV attending comprehensive care clinic in Makueni referral county Hospital, Kenya, reported abnormal cervical cytology prevalence of 25%, where 15% had HSIL(22). Research on comparison of conventional cervical cytology versus VIA among HIV-infected women in western Kenya reported a prevalence of 43.7 % and 55.3%, respectively(23). However, histology reported a prevalence of 61.3 %, demonstrating the need for cervical smear triaged with VIA in HIV-infected women.

A study on risk factors for cervical pre cancer detection among previously unscreened HIV-positive women in Western Kenya using VIA test, cervical smear screening tests, and histology reported that the most common abnormal colposcopy findings were that of aceto-white, representing 88.9%(24). Although VIA showed most of the irregular lesions, histology showed CIN2+ representing 58.8%. The study indicates that an additional screening test is necessary than

using VIA alone to avoid false-positive results that could lead to overtreatment of the patients. Although VIA is recommended as a screening test, research in India on early detection of cervical cancer with VIA methods reported a lack of standard means of quality control for the VIA-based screening tests(25).

Tanzania's journal of health research 2009 reported the prevalence of SIL among asymptomatic HIV-positive women in Tanzania as 2.9 %(26). The research is consistent with other studies in Tanzania that reported SIL prevalence of 2.4% and 4.9% in Nairobi, Kenya(27). Since the establishment of antiretroviral therapy, the rate of mortality has decreased without concomitant immune reconstitution. The decreased rate of mortality among HIV positive women have led many to acquire other infections including oncogenic HPV due to immunosuppression. In a cross-sectional analysis of factors associated with the detection of oncogenic HPV in HIV-infected women, 68.7% of the women were HPV positive, and 52.6% had high-risk HPV(28). The study shows that HIV-positive women are at risk of contracting oncogenic HPV and require to be frequently screened to detect high-risk HPV early before transforming to invasive cervical cancer(29).

A study has indicated that among the 12.7 million new cancer cases reported worldwide 610, 000 are attributable to HPV infection(30). A research study on prevalence and determinants of HPV infection and cervical lesions in HIV-positive women in Kenya reported the burden of high-risk HPV and CIN11 or CIN111 to be high and related to HIV infection (31). The study shows that HPV prevalence was 90.3% in women with CIN11 /CIN111. HIV-positive women are prone to developing high-risk oncogenic HPV and pre-cancerous lesions(32).Research conducted at Tigoni Kenya reported that HPV increase in samples with abnormal cervical smear was 52%, and 80% in those with biopsy-confirmed CIN111 or higher (33).

Studies in Eldoret, Kenya, reported a more significant proportion of high-risk HPV in HIV-positive women than HIV-negative women(19,28). Research suggests that high rates of HPV might result in reduced clearance of HPV, abnormal cervical lesions, and cervical carcinoma in HIV-infected women(13). A study conducted in Mombasa reported an increase of HPV53 in CIN 111 lesions. The oncogenic HPV viruses include strains 16,18,31 ,35 ,39, 51,52 ,56 , 58,59,68. A research study on public health and epidemiology has argued that 99.7 % of HPV is present in all cervical cancers (34). Research suggests that oncogenic HPV strains 16 and 18 are present in 70 % of

cervical cancers(35). Persistent infection with high–risk HPV is the primary cause of pre-cancerous lesions and cervical cancer(36).

Although cervical cancer is a burden in Kenya and the disease is easily preventable through screening , vaccination and early detection, only 3.2% of women aged 18 to 69 years have been screened (37). The research further suggests that only 5% of women in developing countries undergo cervical cancer testing than developed countries, where approximately 40 % of women have undergone testing. There is an urgent need to screen HIV-infected women for cytological abnormalities to prevent cervical cancer. Globocan 2019 reports that HIV positive women are 4-5 times more frequently affected by cervical cancer(32). Early examination of pre-cancerous lesions and follow-up is essential, especially to the high-risk group. Different researches have reported a remarkable decline of pre-cancerous lesions and invasive cervical carcinoma in countries that primarily introduced the screening of cervical cancer(38–40).

2.3 Prevention of cervical cancer by primary prevention.

In Kenya, visual inspection has been a guideline for screening cervical cancer because it is readily available, easy to use and economically viable, although it has limitations. The increase in global cervical cancer, especially in low resourceful and middle-income countries, has driven WHO to implement various cervical cancer screening methods, including primary prevention and secondary prevention to minimize invasive cervical cancer(41).

WHO has recommended the primary prevention of cervical cancer by vaccination of young women and adolescents against high risk HPV 16 and 18 before they engage in sexual debut(42). Research has reported success in reducing cervical cancer by using HPV vaccines the long-term vaccine effectiveness in preventing invasive HPV-related diseases and invasive cancer is a success. The two approved trade names of high risk HPV vaccines include Gardasil and cervarix. Many countries have licensed usage of these vaccines. However, the introduction varies in different countries. In some countries, vaccines are available only on user-pay bases. Therefore, HIV-positive women may not afford it because HIV/AIDs have consumed the family resources leaving them helpless. The out-of-pocket expenses have resulted in the unequal uptake of vaccines and an increase of pre-cancerous lesions culminating in invasive cervical cancer(43). HPV vaccines are meant to prevent young women and adolescents from getting infected with high risk HPV 16 and

18, although many have sexual debut before they acquire the HPV vaccine subjecting them into risk of infection with the virus.

2.3.1 Prevention of cervical cancer by secondary prevention

Secondary prevention has shown success in reducing pre-cancerous lesions and cervical cancer. Some secondary methods include VIA / VILI test, cervical smear test, molecular test, polymerization chain reaction, and HPV tests. In countries with organized cervical smear screening, the prevalence of cervical lesions tends to decline(44). The detection of pre-cancerous lesions early with follow-up is crucial, especially for the high-risk group, to reduce the transformation to invasive cervical cancer. Most of the HIV positive women attending CCC in Mbagathi District Hospital reside in Kibra slums and could have started sexual intercourse early because of the poverty level in the slums.

2.4 Epidemiology of cytological abnormalities

Research studies reports that HIV-infected women have an increased risk of pre-cancerous lesions than HIV-negative women(23,45–47). There is variation in the prevalence of cytological abnormalities in different countries, including Southern Ethiopia 22.1 %, Nigeria 22.6%, South Africa 17.3%, and Cambodia 6.3%(48). A research study reported cervical epithelial lesions prevalence as 15 % among commercial sex workers in Nairobi County, Kenya (19).

The variation is due to the sample size used in different studies, social demographics, and exposure. The measures in place to prevent cervical lesions contribute to the difference in variation observed in other countries.

2.5 Some of the risk factors associated with abnormal pap smear findings and VIA findings

Women with more than one-lifetime partner are at risk of infections with STDs, including high risk HPV which transforms to pre-cancerous cervical lesions(1,26,39). Other research studies suggests that the more sexual partners, the likelihood of persistent oncogenic HPV(12,20). Prostitutes are at increased risk of contracting STDs, including the herpes simplex virus, affecting cervical cancer's etiology (49). Sexually transmitted infections likely to be acquired by multiple sexual partners include chlamydia trachomatis, gonorrhea, and trichomonas vaginalis. Another study suggested that women aged 20 years and below might develop cervical cancer when they

engage in early coitus and contraceptives use(50). Women with low economic and social backgrounds rarely seek cervical smear testing, and they have high chances of developing squamous intraepithelial lesions.

2.6 Parity

Multiparity may be a risk factor for cervical epithelial lesions, leading to cervical cancer(51). The study further suggests that women with more than four children are 10.9 times likely to develop epithelial cell abnormalities than women with fewer children.

2.7 Symptoms of abnormal cervical lesions

Unexplained cervical bleeding may be a sign of unusual cervical lesions (48). The foul smell emanating from the vaginal area, fatigue, nausea, and weight loss may be signs of abnormal squamous lesions.

2.8 Management of cervical lesions

Treatment of cervical lesions involves two modalities, including excisional and ablative therapy. Excision biopsy is sent to the laboratory to confirm the irregular lesions. In ablative procedure, biopsy is removed, denatured, and no further study. Cryotherapy and laser therapy are examples of ablative treatment. When cryotherapy method is an option as part of the cure, the abnormal cervical lesion is frozen, and then it sloughs off. Treatment involving laser therapy subjects light to destroy cervical lesions. The types of excision biopsies include (LEEP) procedures and conization. LEEP's method comprises electrosurgical with a thin wire loop that removes the abnormal area of the cervix. Conization is a process of eliminating a cone-shaped piece of the cervical region containing the irregular lesion(52). The Bethesda system for reporting cervical smear advises reflex HPV testing for ASCUS. Women testing positive for HPV, whether from reflex HPV testing or co-testing, undergo colposcopy. All women with ASCUS and are HPV negative are recommended for a repeat cervical smear after one year. Low-grade squamous intraepithelial lesion recommendation is to repeat cytology after one year. Women with ASC-H results are recommended for colposcopy regardless of HPV results. Large loop excision of the transformation zone is the option when colposcopy results are positive. However, WHO suggests

a cryotherapy form of treatment for pre-cancerous lesions and excisional procedures for extended lesions and those suspicious of the pre-cancerous glandular lesion(32).

2.9 Reporting of cervical smears

The reporting of cervical smear involves, specimen removal, labeling, specimen fixation, staining, microscopy and evaluation. The appearance of transformation or columnar junction cells suggests that cervical lesions' presence could be detected if present. Marked inflammation and red blood cells will lead to unsatisfactory smears with the sample(53).

2.9.1 Adequate smear which is satisfactory for evaluation

A satisfactory specimen must obey the Bethesda system for reporting Pap smear. The way the smear is collected, processed, and evaluated determines the adequacy of the specimen. Information on transformation zone/ columnar junction and other qualifiers must reflect in the report. Squamous cells originating from the columnar junctional or transformation zone are noted by squamous metaplastic cells and endocervical cells(53,54). In an adequate smear seventy five percent of the background should be interpretable. A satisfactory smear should have at least 5000 to 12000 cells.

2.9.2 Unsatisfactory smear

The personnel dealing with specimens are required to report if the sample has been processed or evaluated. When the sample is received and not processed, the reason must be indicated, including the broken or not labeled slide. When assessed and is unsatisfactory, then it should be stated that the specimen is processed, examined but inadequate for evaluation because of marked inflammation or obscured by blood(53,54).

2.9.3 Abnormal cytology result

An abnormal cytology is reflected when the nuclear of squamous cells show atypia and is larger than that of an intermediate cell. The nuclear of an intermediate cell is used as a reference to measure abnormal squamous cells. A normal intermediate cell nuclear measures 35microns. Bethesda system for reporting cervical cytology classifies squamous cell abnormalities into epithelial cells abnormalities. The epithelial cell abnormalities includes, atypical squamous cell of undetermined significance (ASCUS), atypical squamous cells – cannot exclude a high grade squamous intraepithelial lesion (ASC-H). Atypical squamous cell of undetermined significance

measures two and half to three times that of an intermediate squamous cells and refers to nuclear changes that are suggestive of low grade squamous intraepithelial lesion. Atypical squamous cells - cannot rule out high grade squamous intraepithelial lesion refers to squamous cell changes related to high grade squamous intraepithelial lesions. Squamous cell abnormalities involve a spectrum of non-invasive epithelial abnormalities associated with human papilloma virus (HPV) (53).High grade means that the nuclear has irregularities, increased nuclear-cytoplasmic ratio, hyperchromatic nuclear, coarse chromatin granules or salt and pepper chromatin: Anisocytosis, syncytial patterns, tumor diathesis, and Indian ink files in high-grade squamous lesions. The atypical endocervical cell displays nuclear changes that exceeds reactive or reparative changes. Atypical endocervical cell criteria include nuclear changes, including nuclear overlap, sheets, and strip of cells. In endocervical adenocarcinoma, the requirements include single cells, two-dimensional sheets, syncytial aggregates, and a three-dimensional cluster of abnormal cells(53).

2.9.4 Methods of screening premalignant lesions and cervical cancer

World health organization currently recommends a 'screen and treat' approach for screening pre-cancerous lesions and cervical cancer. VIA test is used to screen pre-cancerous lesions in Kenya; however, older women 40 years and above may not benefit from the test since the transformation zone recedes to the endocervical canal; therefore, the cervix is not accessible. Although VIA and HPV tests are the methods of choice for screening pre-cancerous lesions, HPV test is expensive, and most patients may not afford it. In addition, screening pre-cancerous lesions and cervical cancer by cytology, colposcopy, and biopsy is time-consuming. However, triage of cytology with VIA will improve the management of HIV-positive women(55).

2.9.5 Problem statement

Mbagathi District Hospital has a high population serving people from the surrounding slums. Most of the HIV positive women attending CCC in Mbagathi District Hospital are poor and unable to pay for the HPV vaccines, and therefore are at risk of infection with oncogenic HPV 16 and 18, found in 70% of all cervical cancers. The harsh environment in the slums could lead the immunocompromised HIV positive women to have sexual intercourse early before the HPV vaccine, and therefore likely to have acquired STDs including high risk HPV. The HIV positive women attending the facility could be having undetected cervical epithelial lesions. HIV infected

women with Precancerous lesions are referred to Kenyatta National Hospital for better management and end up absconding because of the high cost of services. Kenyatta National Hospital handles referrals, outpatients, and inpatients; therefore, access to the facility becomes a challenge to the HIV infected women. Although VIA has been recommended as a screening method, HIV infected women who are 40 years and above, are likely not to benefit from the method because transformation zone recedes to the endocervical canal, and as a result cervical intraepithelial lesions are likely to be missed and progress into cervical cancer. The PI desired to pick all the squamous intraepithelial lesions by usage of pap smear and VIA.

2.9.6 Study Justification

The National cancer screening guidelines 2018 advocates cervical screening of women who have ever had penetrative sexual intercourse in their lives. The guidance advocates testing women ages 25 years to 49 years since they are sexually active and at a high risk of infection with STIs, including high-risk HPV, resulting in invasive cervical cancer. The Bethesda system for reporting pap smear recommends that women aged 25 years to 49 years undergo cervical smear screening yearly and, when negative, a repeat every three years. Women who have attained Age 50 years to 65 are also at risk and, therefore, should receive Screening every five years.

Although VIA and HPV are the recommended cervical cancer screening tests, HPV test is costly and un affordable. The high cost has led many facilities including Mbagathi District hospital to use VIA/VILI as the only screening method. Visual inspection with acetic acid has some limitations, including the sensitivity of 71% and specificity of 74.3% compared to pap smear, whose sensitivity is 83.3% and specificity of 90.3%, respectively (56). When pap smear is used on HIV-positive women triaged with VIA in urban settings where the prevalence of cervical neoplasia is approximately 15 %, HSIL reported as 4%, misdiagnosis will be minimal, and turnaround time

met (19). Patients are referred to Kenyatta National Hospital for colposcopy/cryotherapy and many end up absconding.

2.9.7 Research Question

What are the VIA findings in HIV-infected women attending Mbagathi District hospital?

What are the cytological findings in pap smears obtained from HIV-infected women attending Mbagathi District hospital?

2.9.8 Broad objective

To describe visual inspection with acetic acid and pap smear findings in HIV-positive women attending Mbagathi District Hospital.

2.9.9 Specific objective

1. To describe the VIA findings in HIV positive women.
2. To describe cytological findings in pap smears obtained from HIV-infected women.
3. To classify squamous intraepithelial lesions among HIV-positive women.
4. To compare visual inspection with acetic acid and pap smear results of HIV women attending Mbagathi District Hospital.

3.0 Methodology

3.1 Study design

Descriptive cross-sectional study

3.2 Study site

The study was carried out at Mbagathi District Hospital's comprehensive care clinic. The hospital is an urban health facility located within the Nairobi County, Ngumo Estate, off Mbagathi road. The facility is a public health hospital bordering Kibra slums where underprivileged people lived in slums near Kenyatta market. The hospital treats both inpatients and outpatients and has a capacity of 250 beds. Mbagathi District Hospital is in the category of level 5 county hospital, although its name has not changed. The hospital serves a population of over 3 million people(57). All HIV-positive women of childbearing age are routinely screened for cervical cancer using VIA / VILI tests. HIV-infected women testing VIA /VILI positive are referred to Kenyatta National Hospital for Pap smear and further management.

3. 3 Study population

HIV-positive women whose age group ranged from 18 years – 50 years consenting to the study.

3.4 Inclusion criteria

Women infected with HIV, aged 18 years - 50 years with formal consent.

3.4.1 Exclusion criteria

Those already diagnosed to have cervical cancer

Women who have undergone a hysterectomy

3.5 Sample size estimation

The number of samples for the study population was calculated using a prevalence of 26.7%, as was observed in a study assessing the prevalence and identified associated risk factors for pre-cancerous cervical lesions among HIV-positive women in resource-limited settings in Kenya. The prevalence of CIN1, CIN11, CIN111, and ICC was 26.7%(58).

$$N = \frac{Z^2 p(1-p)}{D^2}$$

N = Sample size

Z = confidence level on a standard distribution

1.96 is the critical value and corresponds to 95 % CI

P = Expected prevalence of proportions expected at to a particular characteristics**=26.7%**

D = degree of precision set at 10%

n= $\frac{1.96^2 \times 0.267 (1-0.267)}{(0.1)^2} =$ 75 ± 10, the sample size was 75 HIV infected women.

3.5.1 Sampling method

Convenience sampling method was employed to recruit the study participants

3.6 Recruitment and consenting

HIV-positive women referred for visual inspection with the acetic acid test, attending Mbagathi District Hospital, and meeting recruitment criteria were incorporated in the study. All the patients signed the consent form. The nurse and P.I. informed the study participants of the rationale and benefits expected after completing the study; no inducement to participate in the research was given. The nurse recorded the social demographic data and the clinical summary of the patient. In every case, a record of a complete history, clinical details, along with clinical diagnosis was made.

3.6.1 Administration of the questionnaire and consenting

The nurse/research assistant and P.I. administered the questionnaire to the patient. The questionnaire form captured the client's name, phone number, and social-demographic data.

3.7 Sample collection and Laboratory analysis

A trained and experienced nurse in Mbagathi District Hospital collected the pap smear and performed the VIA test. Daily the principal investigator educated the participants on cervical cancer, pre-cancerous lesions, cervical smear test, and VIA tests. The teachings were conducted frequently for the participants who arrived in CCC at different times. The study nurse coordinated

the activities in MCH and assisted the principal investigator in issuing the consent forms and in cervical smear collection. A complete pap smear kit with a cyto-fixative was used, and therefore, the trained nurse had no challenge fixing the Pap smear. The already fixed cervical smears were appropriately packed on a slide box carrier, transported to KNH laboratory Cytology unit for processing. The patient sample was labeled with a unique code that matched the request form identification. The Papanicolau method of staining was applied in the processing of the cervical smears. Preparation of the stain followed the standard operating procedures in the laboratory. The smears were evaluated and interpreted using the current 2014 Bethesda System for Reporting Cervical smears.

3.8 Quality assurance in the laboratory

The P.I ensured that the questionnaire was accompanied by the request form, identified with a unique number that matched the patients' sample. Internal quality control slides were stained first and compared with pre-stained slides to ensure the new batch's quality of the stains used. The P.I screened the slides, later lecturer anatomic pathology unit re-examined the slides again. For quality control in cytology, 10 % randomly picked negative slides, and all the positive slides were re-confirmed by an independent senior lecturer anatomic pathology unit who was the tiebreaker.

3.8.1 Quality assurance in VIA

This was a clinical procedure and the nurse followed the SOPs provided by the ministry of health.

3.9 Variables include the following

3.9.1 Dependent

Variables consisted of Pap smear findings and VIA findings.

3.9.2 Independent

Age, parity, contraceptive use.

3.10 Biosafety measures

The standard safety measures put in place at the KNH cytology laboratory were followed.

3.11 Data Management

Social demographic data was collected and stored in Microsoft Excel, and test results were entered into the IBM SPSS statistics 26 for data analysis. The data storage was done in soft copies with password protection to ensure the confidentiality and security of information. The password was only known to the investigator. Hard copy data was locked in a cabinet with only the principal investigator and authorized persons having access. The records were stored and identified using unique laboratory numbers.

Analysis of study findings: IBM SPSS statistics 26 was used to analyze the data and descriptive statistics for quantitative and qualitative variables. The standard deviation and mean, ascertained for the numerical variables, including age. The results were displayed in bar charts, graphs, and tables.

Data quality control: Training was conducted before the commencement of the study. Patients were advised to read and understand the questionnaire before consenting, and to give only correct and accurate information. Only those patients who qualified for the study were recruited. The PI ensured that the information given was correct by going through it again with the participant. The participants were given codes and the samples were labelled with the same coded information. The data collected was cleansed before processing. This was to make sure that there was no duplication of data, and to avoid any ambiguous or irrelevant data entered into the study. Data collected was monitored and managed properly during the study period.

3.12 Ethical approval and consideration

The study commenced after approval by the KNH-UoN, Ethical research committee, Nairobi Metropolitan Services –Health Directorate's Research Technical Working Group, CEO of Mbagathi District Hospital, and the Matron in charge of the CCC. All the participants provided signed informed consent for participation. The principal investigator delivered the results to the clinician, and with the help of the study nurse contacted all the patients with cervical intraepithelial lesions for treatment. No payments, incentives, or coercion, was used to get study participants. All the specimens were coded with the study numbers to ensure the subjects' confidentiality. The hard copy containing the patient information was kept inside a safe locker. It confirmed that the

investigator had control of the patients' data, thus maintaining confidentiality. The password ensured privacy and the safety of information without leakage of information to unauthorized people.

3.13 Release of the Results

The PI ensured that all the patients with squamous epithelial lesions were contacted, and booked for treatment.

4.0 Results

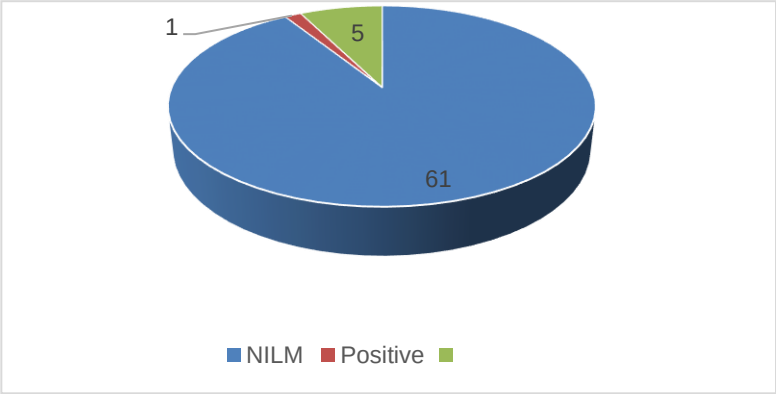
Seventy five HIV positive women were recruited and incorporated into the study. Out of the 75 participants' mean age was 38.3 years (n=75) (SD 7.3), and the age range was 20-49. In this study, 47(62.7%) of women were married, 28(37.3 %) single with a mean parity of 3, and a standard deviation of 1. The study population had 5(6.7 %) tobacco users.

4.1 Table 1. Social demographic characteristics

Variable	**Frequency(years)**	**Percentage**
Mean age (SD) (Years) **Median** **Range in years** 20 – 30 years 31 – 40 years 41 – 49 years 50 - 65 years	38.3 years (SD 7.3) 49 years 20 – 49 years 15 years 26 years 34 years 0	 20% 34.7% 45.3%
Marriage status	Frequency (n)	Percentage%
Single	28	37.3%
Married	47	62.7%
Parity Mean	3 (sd 1)	
Source of Pap smear information	Frequency (n)	
Hospital highest source	35	46.7%
Tobacco users	5	6.7%

VIA findings in HIV positive women

The majority of the women, 69(92%), had a negative VIA result, 1(1.3%) positive, and 5(6.7%) suspicious acetowhite reactions.



Key:

NILM-

Negative for intraepithelial

Lesion or malignancy

4.2 Figure 1. Results of VIA findings in HIV positive women

Cytology finding

The cytological findings found among the study participants were 6(8%) ASCUS, 6(8%) LSIL, 4(5.3%) HSIL, and 1(1.3%) SCC. Other findings in the study included 1(1.3%) T.V, 3(4%) fungal organisms consistent with candida species, 10(13.3%) B.V. Bacterial vaginosis was the most common finding among the study population.

4.3 Table 2. Cytological findings in Pap smears

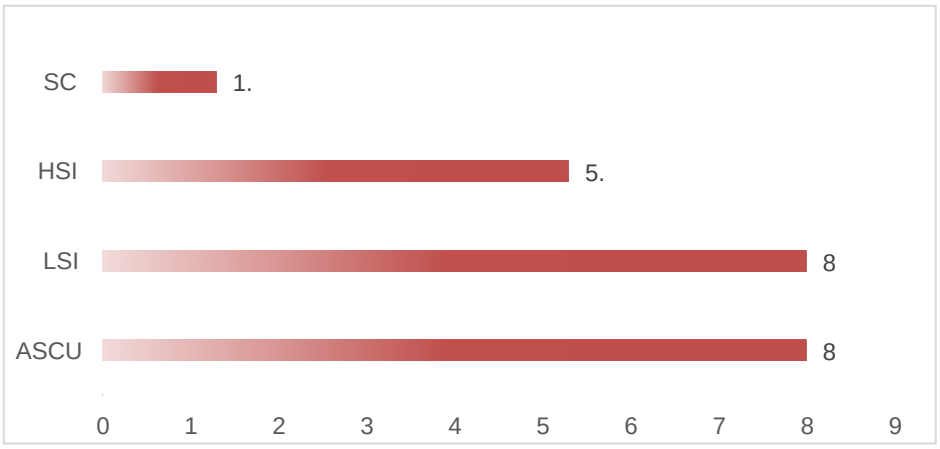
Squamous intraepithelial lesion	**Number**	**Frequency %**
ASCUS	6	8%
LSIL	6	8%
HSIL	4	5.3%
SCC	1	1.3%
Organisms		
B.V	10	13.3%
T.V	1	1.3%

Candida	3	4%
Other findings		
Atrophy	9	12%
Inflammatory smears	6	8%

Key:

T.V = Trichomonas vaginalis, B.V = Bacterial vaginosis

Low grade lesion ASCUS 6(8%) and 6(8%) LSIL were the commonest cervical lesions among the study population followed by the high grade lesions HSIL 4(5.3%) and squamous cell carcinoma 1(1.3%). Visual inspection with acetic acid missed 13(17.3%) cervical epithelial lesions picked by pap smear.



Key:

SCC: Squamous cell carcinoma

4. 4 Figure 2: Classification of the squamous intraepithelial lesion in 75 participants

4. 5 Table 3: Comparison of Visual inspection with acetic acid and Pap smear results

VIA	positivity	Pap smear	Number
SCC	**1**	SCC	1
HSIL	**1**	HSIL	4
LSIL	**2**	LSIL	6
ASCUS	**0**	ASCUS	6

VIA reaction due other causes	Number
Atrophy	1
Inflammatory smears	1

Statistical tests for Significance:

Statistical tests for significance was not done because some of the lesions confirmed by Pap smear, including ASCUS are not classified as precancerous lesions. Visual inspection with acetic acid had a reaction in atrophic smear and inflammatory smears and could not be classified as precancerous lesions.

4.6 Photomicrographs

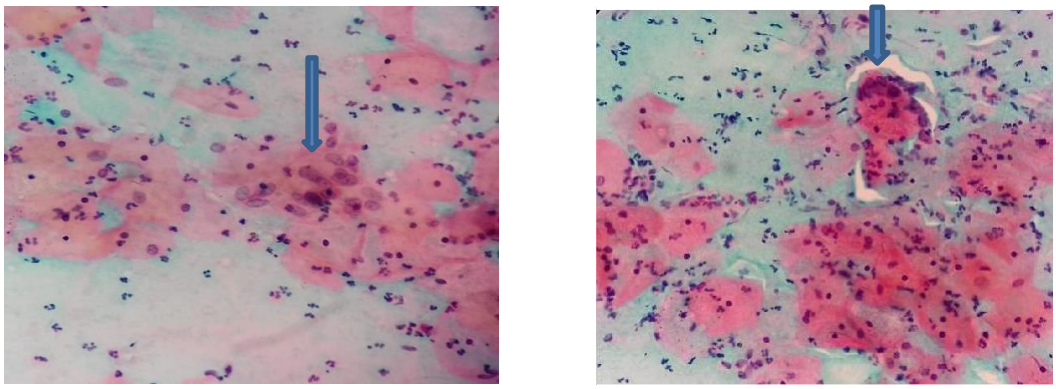


Image 1: Atypical squamous cell of undetermined significance, X 40

Atypical intermediate squamous cell with an increased N: C ratio 2 to 3 times the area of a normal squamous intermediate cell, poorly defined nuclear halo, hyperchromatic, and irregular margins.

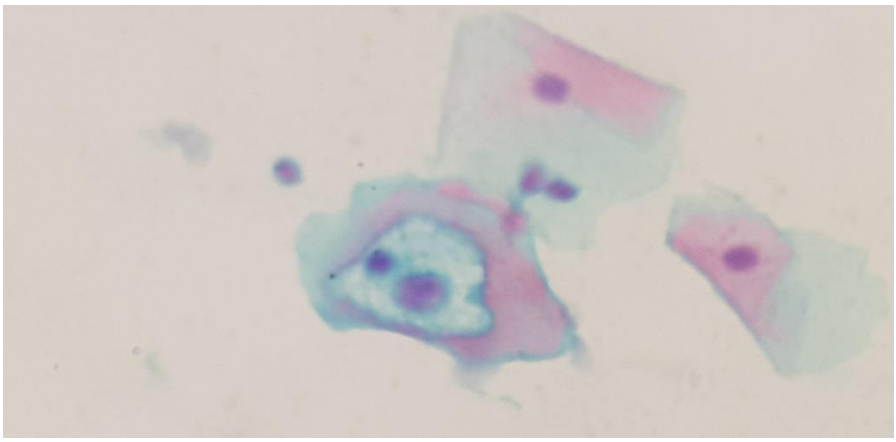


Image 2: **Koilocytes, X 40**

Abnormal squamous cell with an increased N: C ratio almost 3 times the area of a normal squamous cell, hyperchromatic nuclei, perinuclear halo, and thick irregular cytoplasmic margins as shown in in images 3 B and C.

A

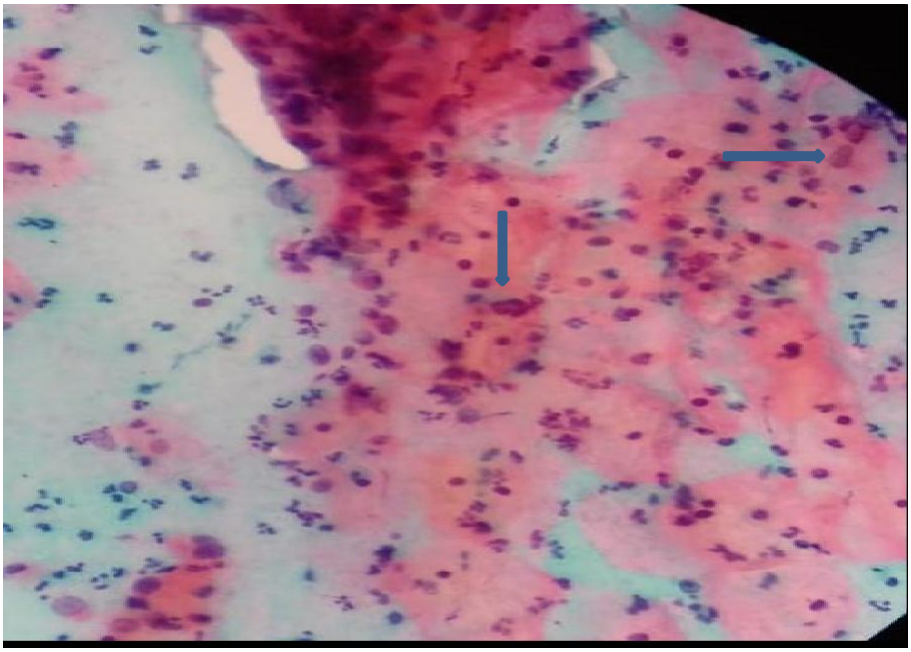
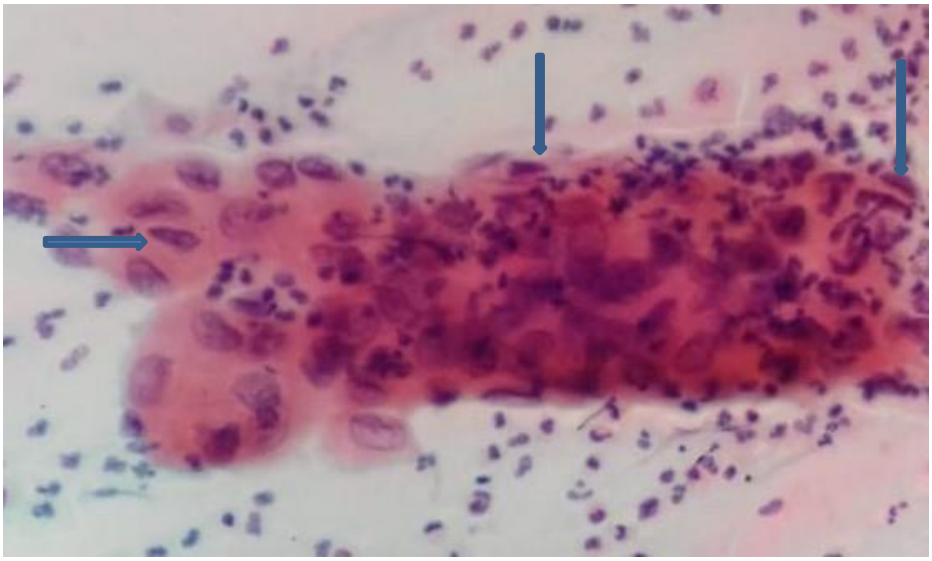


Image 3. LSIL – Low grade squamous intraepithelial lesion X40

B



C

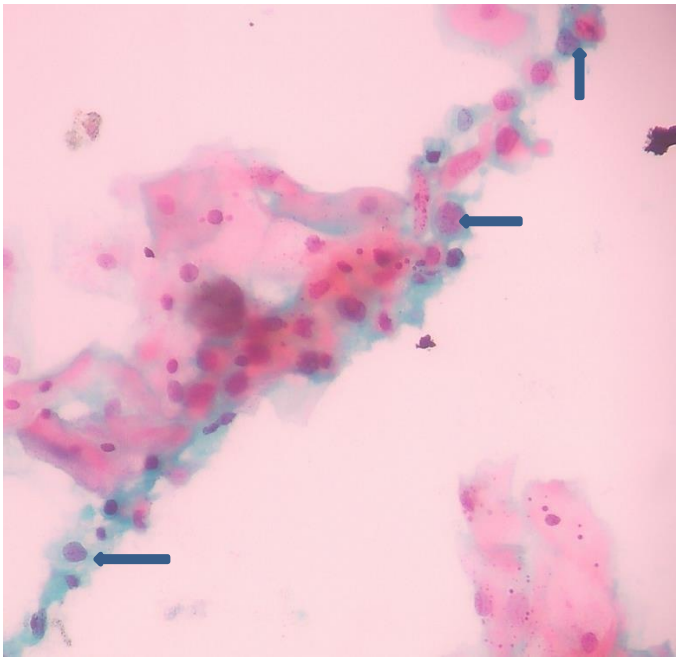


Image 3: A, B, C, above show Low grade squamous intraepithelial lesion, X40

A group of squamous cells with an enlarged nucleus compared to a normal intermediate cell, hyperchromatic nuclei, well-defined perinuclear halos, irregular nuclear margins, and some with an inflammatory cells in the background.

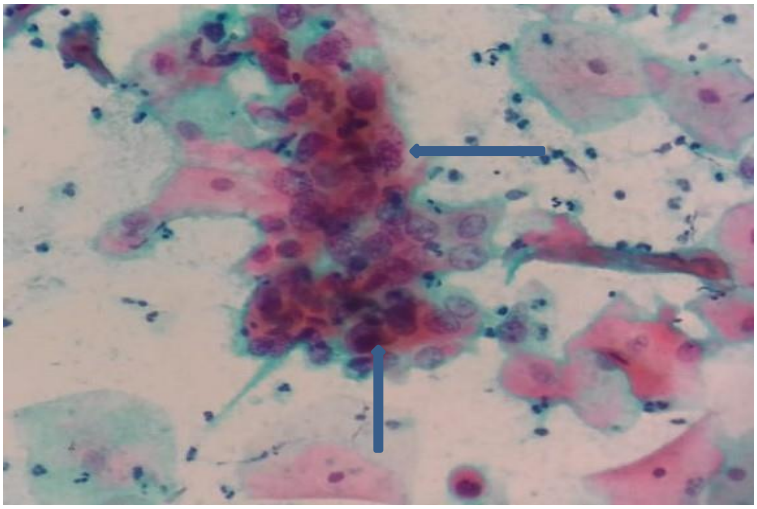
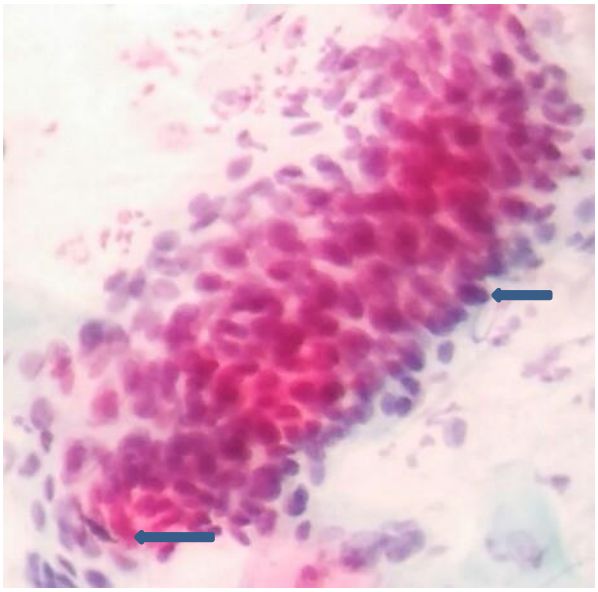
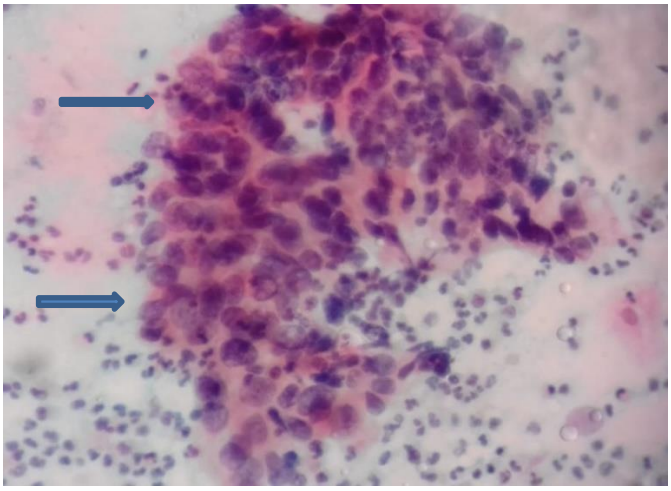
A 

Image 4: High grade squamous intraepithelial lesion X40

B 

HSIL - High grade squamous intraepithelial lesion X40

C 

HSIL- High grade squamous intraepithelial lesion X40

Image 4A , a cluster of tightly cohesive squamous epithelial cells exhibiting a raised nuclear-cytoplasmic ratio, pleomorphic nuclei, hyperchromatic group of cells, salt and pepper chromatin, irregular margins, flattening of cells at the edges of the cluster, a feature suggestive of HSIL. Images 4 B & C shows a tightly cohesive cluster of epithelial cells exhibiting high N/C ratio, pleomorphic nuclear, open chromatin granules, and others salt and pepper chromatin, hyperchromatic, and others are spindle-shaped and flattening at the edges in the background with marked inflammation.

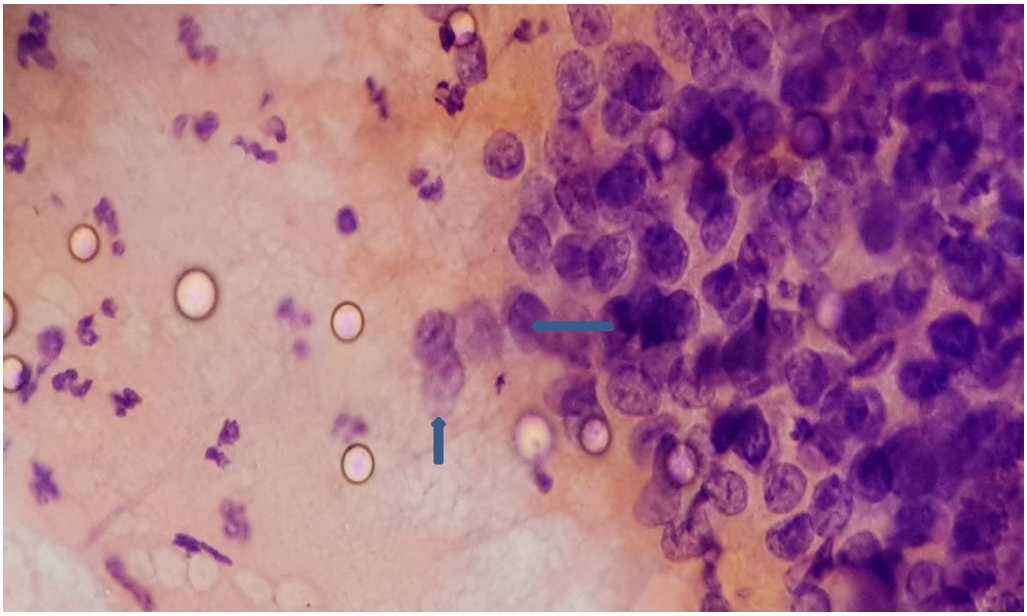


Image 5. **Squamous cell carcinoma X 40**

A tightly cohesive cluster of squamous epithelial cells with a high N: C ratio, pleomorphic, hyperchromatic, irregular margins, coarse chromatin granules, open chromatin, Macro nucleoli, and tumor diathesis.

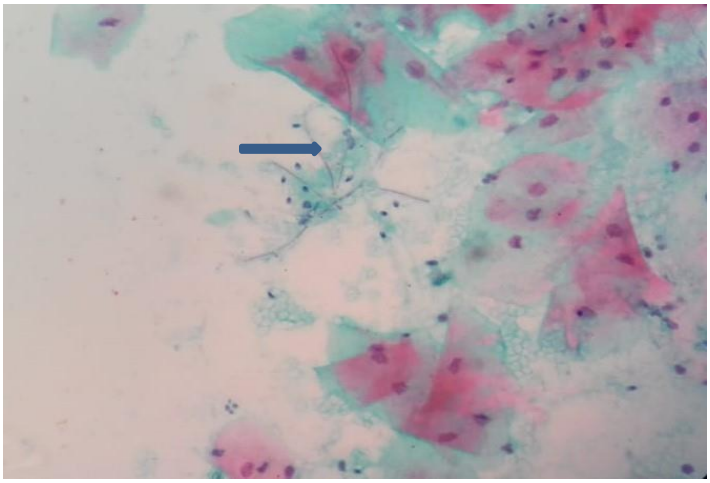


Image 6: Fungi organism consistent with candida species X40

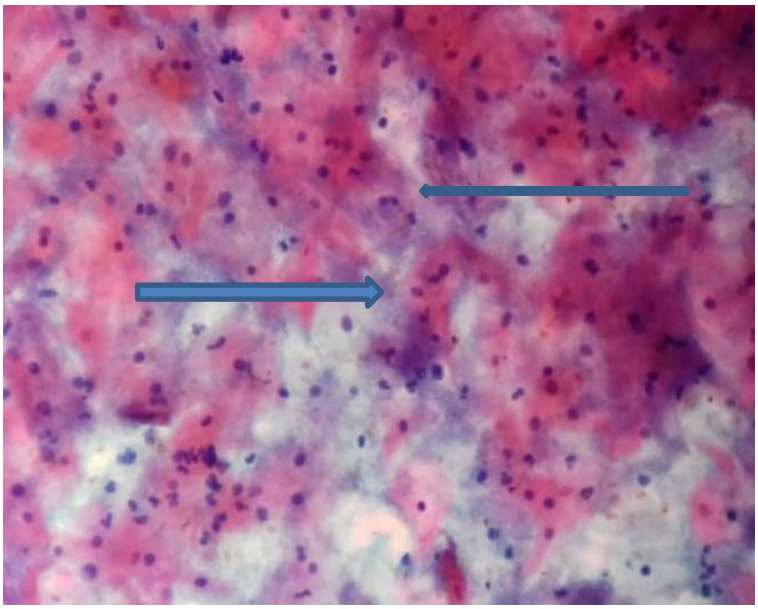


Image 7: **Shift in flora consistent with Bacterial Vaginosis X40**

Coccobacilli covering the cells and a filmy background consistent with Bacterial vaginosis.

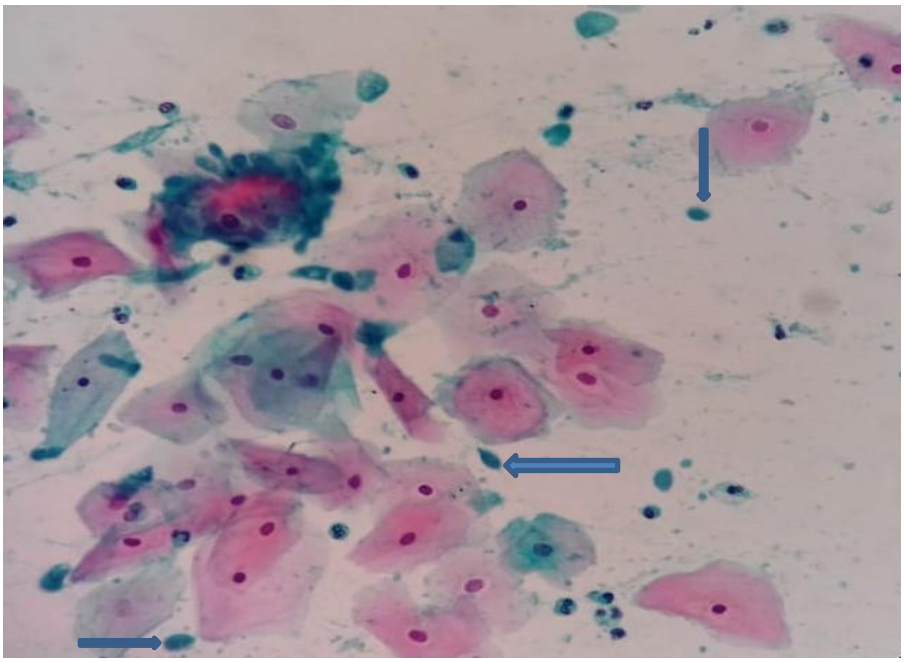


Image 8: T.V – Trichomonas vaginalis X40

Organisms that are pear-shaped, eccentrically located nuclear morphologically consistent with Trichomonas vaginalis

5.0 DISCUSSION

The study intended to pick several cervical intraepithelial lesions by the use of VIA and pap smear in HIV positive women attending Mbagathi District Hospital. Pap smear has a high specificity, but low sensitivity when compared to VIA. The two screening methods picked only a few cervical intraepithelial lesions. In this study, VIA had a positivity of 6(8%), with 1(1.3%) positive reaction and 5(6.7%) suspicious reactions for the cervical intraepithelial lesions. This study is comparable to that of Mustafa et al.2010 where VIA positivity was reported as 9.9%(59). In their study, 6.2% out of the 9.9% were diagnosed with precancerous lesions. In this study, 4(5.3%) out of 6(8%) were confirmed by pap smear to be cervical epithelial lesions. The interpretation of VIA results depends on the expertise of the personnel performing the test. A study done in Ethiopia by Kebede et al. 2017 among healthy women VIA positivity was reported as 6.7% (34). This is similar to the findings in this study at 6 (8%). Research study by Anderson et al.(2015) reported VIA positivity as 10%(60). The difference found in this study is that the study participants were HIV-positive women attending CCC, while Anderson et al.2015 study involved three countries with different infrastructure and screening programs. Chung et al.2013 study reported VIA positivity as 40% and pap smear 61.4%(60). The difference observed could be due to the duration of HIV management in this population. VIA had a negative reaction to 13(17.3%) cervical lesions confirmed by pap smear. Interpretation of VIA test, and the judgment of the personnel performing the test could have played a significant role in the outcome results. In the current study VIA missed a significant number of lesions confirmed by pap smear.

The current study reported abnormal findings as 22.7%, ASCUS and above. A similar study in Makueni reported abnormal cervical squamous lesions as 25% , ASCUS and squamous cell carcinoma (23). The difference in our study is that the study population was annually screened for cervical epithelial lesion using VIA screening method. The PI expected pap smear positivity to rise, although the percentage of cervical epithelial lesions was low. Women in urban areas are more exposed to cervical cancer screening, are knowledgeable about pap smear test and the many satellite clinics in Nairobi county, could have forced many women to seek health services explaining the slight difference encountered in our study (61).

The study found VIA positivity to be 6(8%). Visual inspection with acetic acid positivity rate was expected to be high because the study population were on routine visit to CCC and some could be visiting CCC for the first time while others could be on ARVs for the first time. Cytology has a high specificity compared to VIA. The high sensitivity in VIA and high specificity in cytology could explain the difference experienced in the two screening tests. Although VIA has been confirmed as a "screen and treat" test nationally this study has proved that using VIA alone could be risky to the HIV positive women. This study has shown that VIA test missed significant number of lesions which were confirmed by pap smear test, subjecting HIV infected women at risk of developing high grade cervical intraepithelial lesions and SCC. Although the health personnel conducting VIA was experienced ,confounding factors including the batch of acetic acid used, and old age above 41 years could have caused VIA to miss the squamous epithelial lesions(62). A study has reported decrease of VIA sensitivity at ages 41 years and above, reflecting VIA inability to detect changes in the transformation zone. However in the same study pap smear positivity remained unchanged when compared to HPV and VIA methods(60). In the current study, recruited participants with ages 41 years to 49 years had the highest percentage (45.3%) and frequency of 34 years. In future studies, confounding factors related to age should be ruled out. In our study pap smear combined with VIA would offer excellent results for the management of HIV positive women. Pap smear had a positivity of 22.7%, becoming an alternative test for the management of HIV positive women. The results of pap smear in this study was confirmed by two experienced pathologists in the Department of Human Pathology University of Nairobi.

Conclusion:

- The prevalence of cervical intraepithelial lesions by pap smear was 22.7%.
- The prevalence of cervical lesions by VIA was 6(8%).
- High false-negative findings by VIA was noted in this study

Recommendations:

- The presence of precancerous lesions among the recruited study participants calls for pap smear triage with VIA for proper management of HIV infected women

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Appendix 1: Participants information

TITLE: VIA AND PAP SMEAR FINDINGS IN HIV POSITIVE WOMEN ATTENDING MBAGATHI DISTRICT HOSPITAL

INVESTIGATOR: CHARLES MWANGI MACHARIA

MOBILE phone**:** 0718101610

My name is Charles M. Macharia, a postgraduate student at Nairobi University, pursuing a Master of Science degree in clinical cytology. The study involves cervical smear collection and VIA test after consenting to my research. Cervical smear slides are going to be fixed with 95% ethanol, stored in slide folders. Then I will transport them to the cytology laboratory at Kenyatta National Hospital, where processing, staining with Papanicolaou will be done. Examination and Reporting of the cervical lesions are steered by the Bethesda system for reporting cervical smears.

Pap smear triaged to VIA, the specificity and sensitivity are approximately 99.9 % and will benefit you as a patient. Human papillomavirus (HPV) testing is another test recommended together with VIA for screening cervical lesions. Unfortunately, most facilities will not afford HPV testing because it is expensive and requires more planning and trained professionals. A cervical smear is a simple test for you and could be performed in a rural setup together with VIA. As a patient, you have the right to ask any questions related to this study. This consent form aims to guide you and explain information concerning the research. The process of going through the questionnaire and asking questions concerning the study is called informed consent. Now that I have explained everything to you, may I continue?

The question is direct, and you are required to answer Yes / No.

Purpose of the study:

To know the abnormal cervical lesions in HIV-positive women attending Mbagathi District Hospital. It will be achieved by using Pap smear triaged with VIA in HIV-infected women.

Study Procedure

I am a trained nurse, and I will correct cervical smears from your cervix and perform the VIA test. Removal of a Pap smear will commence, followed VIA test. The procedure is not painful, but you may experience slight discomfort. The room has a coach, and you are required to sit on top and remove your in aware and stay in a lithotomy position. A beam of light will be directed to your genital area, and the spectrum inserted so that the cervix can be viewed. A cytobroom will be used to collect the smear from your cervix. Pap smear slides will be prepared from cervical material, which is collected for evaluation by the Principle investigator. VIA test is done by smearing 1% acetic acid in the cervix and observing the reaction after 1minute. The performance of the two screening tests and assessment is a priority of the principal investigator. The slides will be fixed immediately with 95% ethanol for 15 minutes and placed in a slide folder awaiting transportation to the cytology laboratory in Kenyatta National Hospital for processing and staining with the Papanicolaou method staining. The principal investigator examines the slides, then a pathologist, and in case of a discrepancy, a second pathologist will be a tiebreaker. After the study, the prepared slides will be kept in safe custody for future evaluation should need to arise.

Voluntarily of participation

The decision to participate in this study is entirely free and voluntary. As a patient, you are free to ask questions related to the study.

Confidentiality

The questionnaire form will be locked in a locker and the keys kept by the principal investigator. Slides will only have the research number given by the principal investigator. The results will be given to the clinician directly. Nobody will be allowed to have access to the results except the supervisor. During the Pap smear and VIA test collection, patients will be issued with code numbers to enter. Again no unauthorized person will be allowed to enter the room. The patient will be allowed to speak if she feels that confidentiality is compromised. Relatives will not be allowed to know the results unless the patient authorizes them.

Benefits

The study will contribute to providing knowledge of the burden of cytological abnormalities of the cervix. This study will be of great benefit to you because cervical smears will be offered free. The research will propose to the policymakers to triage VIA and cervical smear in all routine screening tests involving HIV-positive women.

Risks

Although there are no anticipated risks, you may experience slight discomfort when the speculum is inserted into the genital area. During Pap smear collection, you may experience mild pain, but very rare.

Right of withdrawing

It is your right to withdraw from the study at will, and you will still receive your services without any problem or strain.

Transfer of the Specimen to KNH laboratory cytology unit

I will inform you in case a need arises to transfer your sample to another facility.

Role of the participant

I am expecting you to ask questions or clarification where you do not understand. After the teachings, you will receive guidance on filling consent forms.

Participants consenting form

I .....have read and understood what the research study involves and agree to participate in the research study without coercion/pressure or inducement of any kind. As a participant, I can withdraw from this research study without my democratic rights of service interfered with in Mbagathi Hospital.

Participants signature Thumbprint…….. Date……..

Investigator's signature…….. Date…….

Witnessed by Doctor / Clinician/ Nurse…… Date…….

Contact information/future communication

For any questions regarding the study, the following people are contacts.

Investigator

Charles M. Macharia

Mobile 0718101610 / 0737820929 or

UON Contacts

Department of Human Pathology

Tel. numbers 2726300 ext. 44102, email uonknh_erc@uonbi.ac.ke

Supervisors

Dr. W.Waweru - 0722759523

Dr. Joseph R. Ndungu - 0722673749

Miss Josephine Rioki - 0722334323

Chairman of KNH / UoN /ERC Secretary Contact telephone numbers 2726306-9. Ext 44102.

Kiambatisho 2: Idhini ya kufahamishwa

KUFUNGUA PESA LA PAPSMEAR KATIKA WANAWAKE WA VVU VYA UKIMWI WAKATI WAKATI WA MBAGATHI DISTRICT HOSPITAL

WAZIRI MKUU WA MWANGI MWANGI MACHARIA

FONI YA MOBILE 0718101610

Utangulizi

Majina yangu ni Charles M. Macharia mwanafunzi wa shahada ya kwanza katika Chuo Kikuu cha Nairobi akifuatilia Shahada ya Sayansi katika cytology. Utafiti ninaoufanya ni pamoja na ukusanyaji wa saratani ya shingo ya kizazi kutoka kwa kukubali wanawake wenye VVU wanaohudhuria Hospitali ya Wilaya ya Mbagathi. Uchunguzi wa slaidi utafanywa katika sehemu moja na utumiaji wa mfumo wa Bethesda 2014 kwa kuripoti smears ya kizazi. Matokeo ya uchunguzi wa kizazi yatafananishwa na ripoti ya VIA. Wazo ni kukamata vidonda hivyo ambavyo vinaweza kuwa vimekosekana na mtihani wa VIA na kuweza kuainisha vidonda kulingana na mfumo wa Bethesda wa kuripoti Pap smear.

Vidonda vya kawaida vinavyotarajiwa vinaweza kuwekwa kama kidonda cha chini cha ngozi ya ndani (LSIL), vidonda vya squashous vya dalili za ujuaji (ASC-H), kiwango cha juu cha vidonda vya tumbo vya kiwango cha juu (HSIL) au vidonda vya squas. Wakati VIA na smear ya kizazi inatumiwa maalum na unyeti utaongezeka kwa hivyo kuleta faida kwa wagonjwa ambao vidonda vyao vinaweza kukosa. Upimaji wa papillomavirus (HPV) unapendekezwa pamoja na VIA kwa uchunguzi wa vidonda vya kizazi, kwa bahati mbaya, vifaa vingi havitaweza kupima upimaji wa HPV kwa sababu ni ghali na inahitaji wataalam zaidi wa kupanga na mafunzo, lakini uchunguzi wa kizazi ni mtihani rahisi ambao unaweza kufanywa vijijini vilivyowekwa pamoja na VIA hivyo huleta faida kwa wagonjwa. Wanawake walio na VVU watanufaika sana kwa kuingiza njia hizo mbili kwa sababu smear ya kizazi itaweza kuonyesha mabadiliko ya seli ya epithelial kutokana na HPV hivyo kumdhibiti mgonjwa bila kuchelewesha zaidi na gharama.Njia hii ya idhini inakusudia kukuongoza na kuelezea habari juu ya somo langu ili uamuzi ambao unaweza kufikiwa uweze kushiriki katika utafiti au la. Kama mshiriki, uko huru kuuliza maswali yoyote yanayohusiana na utafiti. Kila mshiriki ana uhuru wa kuuliza juu ya faida za utafiti huo, hatari zote zinazohusika, na haki za kila mgonjwa aliyeandikishwa kwenye utafiti. Kama mgonjwa, una haki ya kuuliza habari yoyote ngumu ambayo haijulikani wazi juu ya utafiti huu. Utaratibu huu wa kupitia fomu, kuuliza maswali juu ya utafiti huitwa idhini iliyo na habari. Wakati maswali yote yamejibiwa kwa

kuridhisha na wewe kama washiriki uko vizuri basi unaweza kufanya uamuzi unaofaa wa kushiriki katika utafiti huu au la bila kuathiri haki yako ya demokrasia ya kupokea huduma. Ni muhimu sana kuelewa habari ya jumla ambayo inatumika kwa kila mshiriki katika utafiti huu.

Sasa kwa kuwa nimekuelezea kila kitu na naweza kuendelea?

Swali hili ni moja kwa moja ambapo wewe kama mshiriki utahitajika kujibu Ndio / Hapana

Utafiti wangu umepitishwa na Hospitali ya Kitaifa ya Maadili ya Kitaifa ya Kenya ya Chuo Kikuu cha Maadili na Utafiti ya Nairobi.Nambari yangu ya Itifaki ni._____

Lengo kuu

Kupima Pap smears kutoka kwa wanawake wenye VVU wanaohudhuria Hospitali ya Wilaya ya Mbagathi

Madhumuni ya masomo yangu ni kusaidia kugundua ukiukwaji wa magonjwa ya zinaa katika smears ya kizazi ya wanawake wenye VVU wanaohudhuria hospitali ya Wilaya ya Mbagathi. Aina ya vidonda vinavyoathiri wanawake katika Hospitali ya Wilaya ya Mbagathi vitaandikwa na kuongezwa kwa yaliyosomwa tayari na kumbukumbu. Kesi nyingi za rufaa kwa Hospitali ya Kitaifa ya Kenyatta zitakoma kwani aina ya lesion itaainishwa kulingana na mfumo wa Bethesda wa kuripoti Pap smear na hivyo kurahisisha usimamizi wa mgonjwa na wakati mfupi wa kugeuka. Utafiti huo pia utawafanya wanawake wajue ukiukwaji wa vidonda vya kizazi. Utafiti ni muhimu kwa washiriki kwa sababu watapewa uchunguzi wa bure wa kizazi.

Lengo Mahususi

1. Kuelezea matokeo ya uchunguzi wa cytolojia katika maandishi ya pap yaliyopatikana kutoka kwa wanawake walioambukizwa VVU wanaohudhuria hospitali ya Wilaya ya Mbagathi.
2. Kuamua mifumo ya vidonda vya ndani vya tumbo kati ya wanawake wenye VVU wanaohudhuria kliniki ya Hospitali ya Wilaya ya Mbagathi.
3. Ili kulinganisha ukaguzi wa Visual na matokeo ya uchunguzi wa kizazi ya wanawake wa VVU wanaoenda katika Hospitali ya Wilaya ya Mbagathi.

Utaratibu wa kusoma

Utaratibu utaelezewa mgonjwa na muuguzi aliyefundishwa. Mgonjwa atalazwa juu ya kitanda katika nafasi ya lithotomy. Wafanyikazi waliofunzwa wataingiza wigo katika eneo lako la siri na kizazi chako kitaonekana. Kuingiza wigo sio wasiwasi kidogo lakini haitaleta madhara kwako. Ufagio wa cyto utatumika kukusanya smear kutoka kwa kizazi chako. Mpelelezi atatumia smearya

kizazi iliyokusanywa kutoka kwa kizazi cha uterasi kuandaa slaidi za tathmini. Muuguzi aliyefunzwa atafanya mtihani wa VIA zaidi kwa mgonjwa baada ya ukusanyaji wa somo la kizazi. Mtihani wa VIA hufanywa kwa kupiga asidi ya asetiki 1% kwenye kizazi na angalia majibu baada ya dakika 1. Matokeo ya jaribio yatarekodiwa na baadaye ikilinganishwa na matokeo ya kisaikolojia ya kizazi kuona ushirika wa njia mbili za uchunguzi wa pap.

Slides hizo zitawekwa mara moja na ethanol 95% kwa dakika 15 na kuwekwa kwenye folda ya slaidi inayosubiri usafirishaji kwa maabara ya cytology katika Hospitali ya Kitaifa ya Kenyatta kwa kusindika na kuweka madoa na njia ya Papanicolaou ya kudorora. Mtihani wa smear kwanza utafanywa na mpelelezi kuliko mtaalam wa magonjwa na katika kesi ya kutofautisha, mtaalam wa magonjwa ya tatu angepewa slaidi za kuwa mvunjaji wa tie.

Kujitolea kwa ushiriki

Kwamba uamuzi wa kushiriki katika utafiti huu ni bure na kwa kujitolea.

Kwamba nakala ya fomu hii utapewa kwako kwa kumbukumbu zako. Kama mshiriki, uko huru kuuliza maswali yoyote yanayohusiana na utafiti. Kila mshiriki ana uhuru wa kuuliza juu ya faida za utafiti huo, hatari zote zinazohusika, na haki za kila mgonjwa aliyeandikishwa kwenye utafiti. Mgonjwa ana haki ya kuuliza habari yoyote isiyoeleweka ambayo sio wazi kuhusu utafiti huu.

Usiri

Mteja atahakikishiwa usiri katika kila hatua ya masomo. Fomu ya dodoso itahifadhiwa na mpelelezi wakati wote wa somo na imefungwa kwenye droo. Majina ya mteja hayataonekana kwenye slaidi lakini nambari ya asili aliyopewa mgonjwa. Matokeo yake yatafahamishwa kwa kliniki / daktari moja kwa moja.

Faida

Utafiti huo utachangia kutoa hisia ya mzigo wa ukiukwaji wa cytological ya mfuko wa uzazi. Utafiti huu utaongoza zaidi katika kuunda kuingilia kati kwa kuzuia kwa athari na udhibiti wa sababu za hatari zinazojulikana ambazo zinahusishwa na ukiukwaji wa mzunguko wa kizazi cha uterasi. Utafiti wa utafiti utakuwa muhimu kwa watunga sera kwa kuwa itaongeza maarifa zaidi katika matibabu na usimamizi wa vidonda. Utafiti huu utakusaidia sana kwa sababu uchunguzi wa kizazi utatolewa bure bila gharama ya siri kwa mshiriki. Utafiti huo utapendekeza kwa watunga sera kufanya uchunguzi wa saratani ya mlango wa uzazi katika vituo vyote vya afya nchini Kenya

ambapo wanawake wote watapimwa. Utafiti huu pia utapendekeza kwa wizara ya afya kuweka pesa kadhaa ili kusaidia kuibuka kwa pap katika vifaa vyote vya afya.

Hatari ambazo zinaweza kupatikana na changamoto

Wakati mwingine mtu anaweza kuhisi kwamba maswali yanayo ulizwa ni ya kibinafsi sana, nyeti na aibu.

Utaratibu wa kuondolewa kwa maandishi ya pap sio ngumu, ingawa unaweza kupata usumbufu kidogo. Dokezo ni kitu cha kigeni, na kuiingiza ndani ya eneo la uke inaweza kuwa mbaya, ingawa sio hatari. Kutokwa na damu kidogo kunaweza kuwa na uzoefu ingawa, katika hali adimu, muuguzi mwenye ujuzi atashughulikia hali hiyo. Mila na dini zingine hupiga marufuku wanawake kuficha mbele ya wanaume, na kwa hivyo hii inaweza kusababisha phobia, lakini muuguzi aliyefundishwa atamwelezea mgonjwa umuhimu wa kufadhaisha na jukumu la mtu wa kiume wakati wa mtihani.

Haki ya kujiondoa

Kwamba mtu anaweza kuamua kujiondoa kutoka kwa masomo bila kutoa sababu. Kukataa kushiriki katika utafiti hakuathiri haki za kidemokrasia za kutumiwa ipasavyo.

Uhamisho wa mfano kwa kitengo cha maabara ya KNH mteja ataelezewa juu ya uhamishaji wa vielelezo na uhifadhi iwapo kungetokea haja ya kuhamisha / kuhifadhi sampuli.

Jukumu la mshiriki

Mshiriki atajipata katika kituo cha afya. Mshiriki atashiriki katika utafiti kwa kuuliza maswali au ufafanuzi ambapo yeye haelewi. Baada ya kuelewa mafundisho kutoka kwa mpelelezi mkuu, muuguzi na msaada wa utafiti, mshiriki ataongozwa na muuguzi aliyefundishwa juu ya fomu ya idhini.

Washiriki wa idhini ya washiriki.

Mimi …… nimesoma na nimeelewa nini utafiti wa utafiti unajumuisha, na kukubaliana kushiriki katika utafiti huo bila ushirikianokulazimisha / shinikizo au kushawishi ya aina yoyote. Kama mshiriki, naweza kujiondoa kwenye utafiti huu bila haki yangu ya utetezi ya kidemokrasia kuingiliwa katika Hospitali ya Mbagathi.

Washiriki wa Saini Thumbprint …… The..... Saini ya mpelelezi …….

Tarehe …….

Kushuhudiwa na Daktari / Mganga / Muuguzi

……

Habari ya mawasiliano

Kwa swali lolote kuhusu utafiti, watu wanaofuata wanapaswa kuwasiliana

Mpelelezi

Charles M.Macharia

Simu 0718101610/0737820929 au

Mawasiliano ya UON

Idara ya Patholojia ya Binadamu

Simu nambari 2726300 ext.44102, barua pepe uonknh_erc@uonbi.ac.ke

Msimamizi

Dk W . Waweru – 0722759523

Dk Joseph R. Ndungu - 0722673749

Miss Josephine Rioki - 0722334323

Mwenyekiti wa KNH / UoN / E Katibu wa RC Wasiliana nambari za simu 2726306-9. Ziada 4410.

PROPOSAL TITLE

VIA AND PAP SMEAR FINDINGS AMONG HIV INFECTED WOMEN ATTENDING MBAGATHI HOSPITAL.

Appendix 3: Study questionnaire

Study number …… This questionnaire form aims to determine determinant for cytomorphological abnormalities among HIV-positive women in Mbagathi hospital. Now that you have agreed to participate in my research study, the following information is crucial and significant for the research, and correct, honest answers are required. All information in this questionnaire was confidentially treated. Your name is of paramount importance to this study.

I salute you for agreeing to participate in my research.

Sociodemographic

1. When were you born?
   Date/Month/ Year
2. What about your age? _____
3. Do you have a marriage partner?

☐ Are you married?

☐ Are you divorced?

☐ If married, is your partner arrive?

☐ Might you be separated?

☐ Might you be single?

A. Sexual Behaviors

1. At what age did you engage in penetrative intercourse?
2. What is your parity? (Number pregnancies both living and dead)

☐ Living

☐ Dead

3. When was the last date of your menses?____Years or Months.

4. Have you ever heard of Pap smear? Yes / No - tick answer.

I heard information through a

☐ Friend

☐ Television

Radio

☐ Others_____specify

5. Have you been done Pap smear of late?

☐ Never in life

☐ More than ten years

☐ 3- 5years

☐ 6months – 1years

B. Tobacco use

1. Have you ever used tobacco products? if your answer is yes or no, fill the box below

☐ Not at all

☐ Smokes Cigarettes

☐ Chews tobacco

☐ Others_____specify

2. Currently, are you consuming any of the above tobacco products?

☐ Yes

☐ No

C. Contraceptive

1. Have you ever used any of the following contraceptives? If yes, underline the one that you have used.

A. Jadell, B. Depo Provera, C. Oral contraceptives, and D. IUCD Condoms.

2. Currently, are you using any of the above? If yes specify _____

D. Clinical history

1. The look of the cervix as is seen with a speculum:

☐ Is the cervix normal in appearance?

☐ Does the cervix look eroded?

☐ it look inflamed?

☐ Does it look suspicious for abnormality?

3. History of Hysterectomy if yes or no, please specify _____

E. Results of the study

(i) Convectional Pap smear report:

(a) Specimen adequacy: Satisfactory ( ), Unsatisfactory ( )

(b) Squamous epithelial cells abnormalities _____

(c) Glandular cell abnormalities _____

(d) Organisms present _____

(e) Other non- neoplastic _____

(f) Recommendations _____

Appendix 4: Kiwango cha proposal

Nambari ya masomo …….

Dodoso

-Lengo la fomu hii

Ni kupata maarifa yanayohusiana na utambuzi wa dhuluma za kimabavu kati ya wanawake wenye VVU katika hospitali ya Mbagathi.Kwa kuwa umekubali masomo yangu ya utafiti habari ifuatayo ni muhimu na majibu yanapaswa kujibiwa kwa usahihi na kwa uaminifu.Habari yote katika dodoso hili inatibiwa kisiri.Jina lako ni muhimu sana kwa utafiti huu.Nina kusalimu kwa kukubali kushiriki katika masomo yangu.

Jamii

1. Ulizaliwa lini?

Tarehe /Mwezi / Mwaka

2. Je! Ni nini kuhusu umri wako ?

3. Je ! unayo mwenzi wa ndoa?

Je! Umeolewa ☐

Je! wewe umegawanyika? ☐

Ikiwa ndoa yako imefika ☐

Je! Unaweza kutengwa? ☐

Je ! Unaweza kuwa single ☐

A. Wazoea wa kimapenzi

1. Ulifanya ngono wakati gani

2. Uandilifu wako nini? (Namba za uzauzito wote walio hai na wafu).

☐ Kuishi ☐ Amekufa

3. Je! Ilikuwa tarehe gani ya mwisho ya miaka yako
4. Je! Umewahi kusikia ya papsmear?

Ndio/Hapana –Jibu sahihi

Nilisikia habari kupitia

☐ Rafiki

☐ Televisheni

☐ Redio

☐ Wengine –bayana

5. Je! umefanya pap smear wa marehemu
6. Kamwe maishani

☐ Zaidi ya Miaka Kumi

☐ 3-5 years

☐ 6month to 1 year

B. Matumizi ya tumbaku

-Je! umewahi kutumia bidhaa za tumbaku.Ikiwa jibu lako ni ndio au hapana jaza kisanduku hapa chini.

Hapana kabisa ☐

Sigara sigara ☐

Kutafuna tumbaku ☐

Wengine – baadha ☐

- Hivi sasa unatumia bidhaa zozote za tumbaku hapo juu?

Ndio ☐ Hapana ☐

D. Kuzuia uzazi1. Je! Umewahi kutumia yoyote ya njia za uzazi wa mpango zifuatayo? Ikiwa ndio sisitiza ile ambayo umetumia

Jadell ☐ Depo provera ☐ Mazungumzo ya uzazi wa mpango ☐

Kondomu za IUCD ☐

Hivi sasa , je ! unatumia yoyote ya haya hapo juu? Ikiwa ndio taja ☐

E .Historia ya kliniki

-Kuonekana kwa seviksi kama inavvyoonekana na nadharia.

Je! Kizazi ni kawaida kwa muonekano? ☐

Je , kizazi kinaonekana kukosea ? ☐

Inaonekana imejaa moto? ☐

Inaonekana kutiliwa shaka kwa ujinga? ☐

Historia ya hysterectomy ikiwa ndio au hapana, tafadhali taja. ☐

F. Matokeo ya utafiti

- Ripoti ya uchungushi wa mandishi ya papsmear.

a. Ufanisi wa kutosha : Imeridhisha ( ) , Hauridhishi ( )

b.Ushumbufu mbaya wa seli za epithelial _____

c.Ushumbufu wa seli za tezi _____

d. Viumbe vilivyopo _____

e. Nyingine zisizo neoplastiki _____

f. Maapendekesho _____

Appendix 5: Fomu ya ridhaa kukubali kuwa muhusika wa utafiti

ujumbe

Jina langu ni Charles M. Macharia , nambari ya simu ni (0718101610) mwanafuzi wa Chuo kikuu cha Nairobi idara ya Binadamu Patholojia. Madhumuni ya ujumbe huu nikukujuliza juu ya utafiti unaofanywa na kuhusika kwako kama utaelewa na kukubali kuhusika. Pia nita kuelezea umuhimu wa utafiti huu kwako binafsi ili wewe uamue kama utashiriki au kujihusicha na utafiti huu.Kama muhusika kuna nafasi ya kuuliza swali lolote utakalo,tena umuhimu wako kwa utafiti huu. Hatari na faida utakazopata pia haki yako katika utafiti huu.Katika utafiti huu kuna ruhusa ya kuondoka namasilahi yako, na kuhudumiwa kutaendelea kama kawaida.

Ugonjwa wa saratani ya kizazi umeenea sana duniani kwa kiwango kikumbwa sana,haza Nchi yetu ya Kenya.Ugonjwa huu ume sababisha vifo na kugonjeka kwa mda mrefu.Tena pesa mingi zimetumika juu ya ugojwa huu serikali ikijaribu kupunguza huu ugonjwa ijapokua haija fanikiwa kabisa ku uondoa bali wa zidi kuongezeka maana wamama wengi hawajapimwa kuonekana kama wako na dalili za huu ugonjwa.

Mambo Mengine

Haki yako – Ni haki yako kujiunga na utafiti huu , kuna huru ya kukataa kuhusika kwa utafiti wakati wowote.

Siriyako – Ujumbe wowote utakaotoa utabaki siri na hautafahamishwa kwa mtu au mahali popote. Ikiwa kuna swali lo lote hujaelewa kuna uhuru wakuliza.

Baada ya uchunguzi kama kuna yeyote atapatikana na vidonda vya kizazi au magonjwa ya sinaa atapata mashauri kutoka kwa daktari aliyemtuma afanyiwe uchunguzi.

Maswali

Iwapo una jambo lolote ungependa kuuliza au kujimbiwa asiliana na mkumbwa wa utafiti

Charles Mwangi Macharia nambari ya simu 0718101610 / 0737820929 au msimamizi wautafiti Miss Josephine Rioki nambari ya simu 0722334323**.** Iwapo bado hujaridhika naungependa kueleswa Zaidi waweza kuasiliana na kamati yamadhili ya utafiti hospitali kuu Kenyatta / chuo kikuu cha Nairobi kupitia nambari +254-2-7263000 ext 43769

Wasimamizi- 0722759523, 0722673749, 0722334323, 0727490540, pia Mwenyekiti (KNH /UoN /ERC) – 2726300-EXT.4410

Mambo Mengine

Haki yako

Ni haki yako kujitolea kwa utafiti huu kwa hiari yako, na kuna uhuru wa kukataa kuhusika kwa utafiti wakati wowote.

Siriyako – Ujumbe utakaotoa utabaki siri na hautafahamishwa kwa mtu au mahali popote. Ikiwa kuna swali lolote hujaelewa kuna uhuru wakuliza.Baada ya uchunguzi kama kuna yeyote atapatikana na vidoda vya kizazi au magonjwa ya sinaa atapata mashauri kutoka kwa daktari aliyemtuma afanyiwe uchunguzi.

Maneno ya mshiriki

Mimi.....nimesoma nanikaelewa ninazo hitajika kufanya na vile nina shiriki katika utafiti huu.

Siku ya leo nina weka kindole kama dhibitisho ati nimekumbali kushiriki kwa utafiti huu.

Mshiriki……tarehe……

Swali lolote ungependa kuuliza piga nambali ya simu kwa 0718101610 au Wasimamizi – 0722334323, 0722673749, 0722759523, 0727490540,pia Mwenyekiti (KNH /UoN /ERC) - 2726300-EXT.441

Iwapo bado hujaridhika naungependa kueleswa Zaidi waweza kuasiliana na kamati yamadhili ya utafiti hospitali kuu Kenyatta / chuo kikuu cha Nairobi kupitia nambari +254 2-7263000 ext 43769 au Wasimamizi- 0722759523, 0722673749, 0722334323, 0727490540, pia Mwenyekiti (KNH /UoN /ERC) – 2726300-EXT.441

APPENDICES

Appendix 6: (Lab methods)

Preparation of Pap smear slide

Cervical smear material was spread on a well labelled clean slide and fixed immediately with 95% ethanol.

Papanicolaou staining procedure

1. The smear was dipped in 95% ethanol after removal for 15minutes

2. It was hydrated using descending grades of alcohol (95 %, 80 %, 70 %, 50 %) 10 dips in each jar of ethanol.

3. Slides were washed in tap water ten dips

4. Slides stained with hematoxylin for 4 minutes

5. Rinsed in tap water ten dips

6. Slides differentiated in 0.5 % acid alcohol for 5 seconds

7. Slides dipped in tap water ten dips

8. The slide was blued using Scott's tap water until the smear looked bluish.

9. Slide was rinsed in tap water ten dips

10. It was dehydrated using ascending grades of alcohol.

11. Slides counterstained using Eosin Azure for 3 minutes

12. Rinsed in 3 changes of 95 % grades of alcohol.

13. The smear was stained O.G. 6 for 1.5 minutes.

14. The smear was introduced in absolute ethanol three changes and cleared in xylene three changes.

15. The slide was mounted using DPX and arranged in a folder to dry. The low examination power of the microscope x10 was used and x 40.

Results: Nucleus –Blue-black.

Cytoplasm – Blue-green.

Visual inspection with Acetic Acid procedure

The patient was advised to remove the inner ware and lie on the bed in a lithotomy position.

A beam of light was directed to the vagina.

The speculum was inserted slowly into the vagina until the cervix was visualized.

The speculum was tightened.

A cotton swab dipped in 5% acetic acid was used to rub the cervix.

The cervix was observed after 5 minutes.

Results:

VIA positive test – Well-defined opaque aceto white area.

VIA negative – No formation of aceto white area.

Appendix 7: The Bethesda system for reporting cervical cytology (2014).

- The Bethesda System-2014 consists of components, as outlined below, and is the requirement for reporting cervical cytology.

1. The specimen type – Liquid-based preparation or conventional cervical smear.
2. Specimen Adequacy
   - The specimen must be adequate for evaluation. It means that the sample must be satisfactory for evaluation, including reporting columnar junction/transformation zone cells. The cells include Endocervicals, squamous metaplastic cells.
   - Unsatisfactory for evaluation (the reason must be specified either due to obscuring blood, marked inflammation.
   - Rejection of the specimen (specify the reason)
   - Specimen evaluated but unsatisfactory (reason must be given)
3. General categorization – This is optional
4. Interpretation of results

   -Negative for intraepithelial lesion or the cervical lesions present.

   Organisms present, including T.V, Leptothrix, Fungal elements consistent with candida, Actinomyces bacteria, Shift in flora consistent with Bacterial Vaginoses (clue cells may be an indicator of the condition). Others may include Radiation changes, hormonal, i.e., IUCD, Atrophic smear, etc.
5. Epithelial cell abnormalities are reported.
   - Squamous cells, ASCUS, ASC-H, LSIL, HSIL, ICC.
   - Glandular cell, ASC-H, Glandular cells, Atypical cells, etc
6. Other malignant neoplasm(specify)

Appendix 8

Arrows representing Recruitment, consenting, specimen collection, processing, and reporting

Participants introduced to the study 15minutes → Participants consents → signs questionnaire form → Pap smear procedure explained 15 minutes → Pap smear collected 30 minutes → Investigator makes the smears and fixes 15 minutes → Transported to KNH Cytology lab for staining and Microscopy → Reporting the slides 10 minutes each

↓

NILM – The patient referred to the clinician

↓

for further guidance.

↓

Positive for cervical lesions – results delivered to the

Clinician for further guidance.

→Patients not consenting were not to fill the questionnaire, and their democratic rights were respected.

Specimen processing flow chart

Pap smear wet fixation → Papanicolaou staining → Slides mounted and made to dry

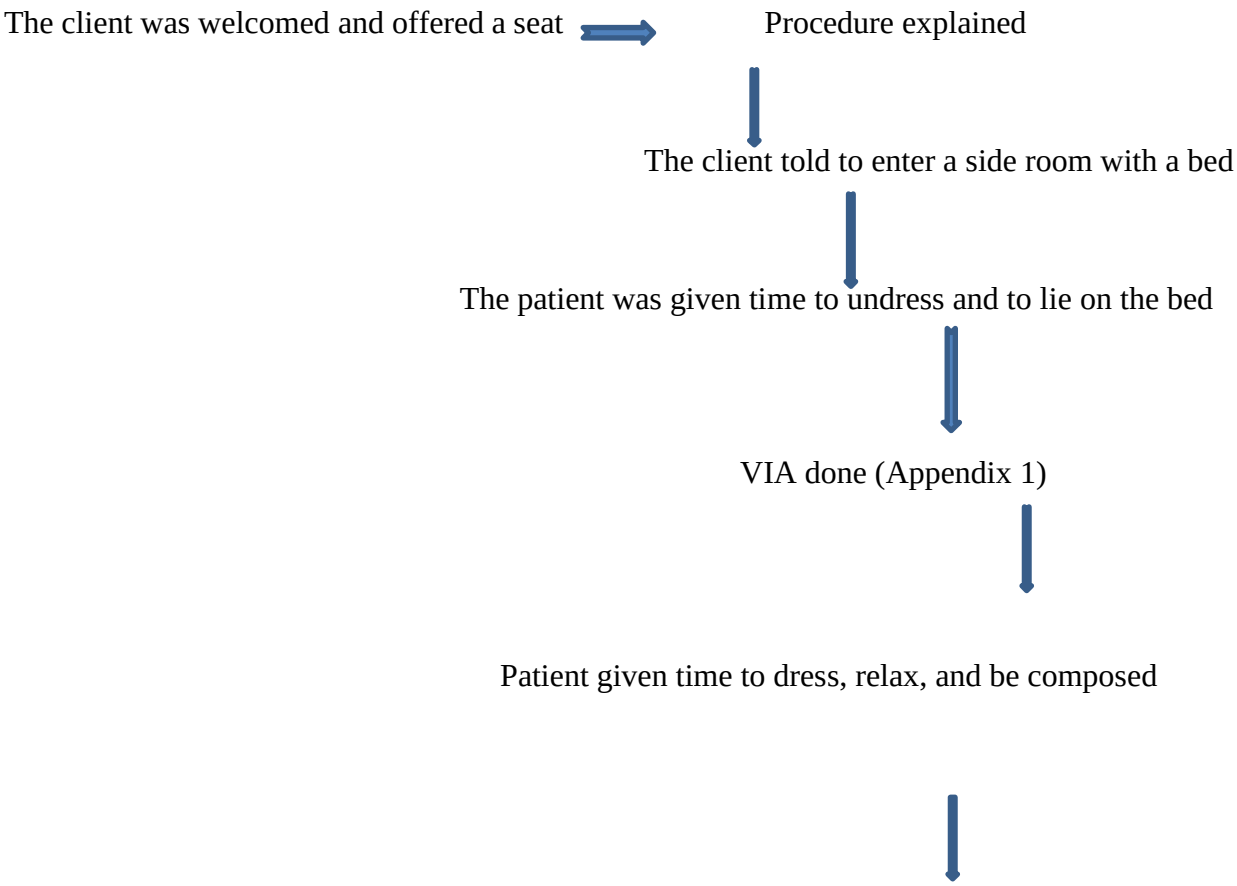
↓

Slide examined microscopically

↓

The result was delivered to the clinician for advice.

Visual inspection with Acetic acid


The client was welcomed and offered a seat
Procedure explained
The client told to enter a side room with a bed
The patient was given time to undress and to lie on the bed
VIA done (Appendix 1)
Patient given time to dress, relax, and be composed