

**PREVALENCE AND CORRELATES OF SEXUALLY
TRANSMITTED INFECTIONS AMONG FEMALE
SURVIVORS OF SEXUAL ASSAULT AT THE NAIROBI
WOMENS HOSPITAL.**

**A dissertation submitted in part fulfillment for the degree of
Master of Medicine (M.MED) in obstetrics and gynecology,
University of Nairobi**

By

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Year 2012.

DECLARATION

This thesis is my original work and has not been presented for a degree in any other university.

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DEDICATION

This work is dedicated to my husband Dr. Isaac I. Munyalo and our lovely sons and daughter- Dennis, Patience and Brandon.

ACKNOWLEDGEMENTS

I would like to express my appreciation to the following:

- My supervisors Prof. James Kiarie and Dr. Gathari Ndirangu for their guidance, support and mentorship throughout the study.
- University of Nairobi for use of its facilities and all lecturers in the department of obstetrics and gynaecology for their training, mentorship and guidance.
- The Kenyatta National Hospital for use of its facilities.
- Dr. Sam Thenya, Mrs. Grace Wangeci, Mrs. Alberta Wambua, Mr. Kilonzo and miss Mary of The Nairobi Womens Hospital GVRC unit for their support during recruitment, processing and analyzing the samples in the laboratory and for allowing me to use their facility.
- Dr. Judith Kimuyu for her support in data analysis.
- All female sexual assault survivors for accepting to participate in the study.
- My parents, Mwanthi Katwikila and Racheal Mwanthi and my brothers- Joseph, Johnstone and Samuel for their support and encouragement.

TABLE OF CONTENTS

TITLE	-----
DECLARATION	-----
CERTIFICATE OF AUTHENTICITY	-----
DEDICATION	-----
ACKNOWLEDGEMENT	-----
TABLE OF CONTENTS	-----
LIST OF TABLES AND CHARTS	-----
ABBREVIATIONS	-----
ABSTRACT	-----
CONCEPTUAL FRAMEWORK	-----
LITERATURE REVIEW	-----
RATIONARE / JUSTIFICATION	-----
OBJECTIVES	-----
STUDY SITE	-----
STUDY DESIGN	-----
STUDY POPULATION	-----
STUDY PERIOD	-----
SAMPLE SIZE	-----
SAMPLING PROCEDURE	-----
INCLUSION / EXCLUSION CRITERIA	-----
PROCEDURES	-----
DATA COLLECTION AND ANALYSIS	-----
ETHICAL ISSUES	-----
RESULTS	-----
DISCUSSION	-----
STUDY LIMITATION	-----
CONCLUSION	-----
RECOMMENDATIONS	-----
REFERENCES	-----
APPENDICES	
(1) CONSENT FORM	-----
(2) QUESTIONNAIRE	-----
(3) LABOLATORY FORM	-----
(4) KNH/ UON ERC CLEARANCE FORM	-----

LIST OF TABLES

TABLE 1: SOCIODEMOGRAPHIC CHARACTERISTICS OF THE STUDY POPULATION (N246).....	
TABLE 2: HISTORY OF PRIOR STIs AND CURRENT PRESENTING COMPLAINTS	
TABLE 3: RISK FACTORS ASSOCIATED WITH SEXUAL ASSAULT AND STIs.....	
TABLE 4: LABORATORY TEST SRESULTS	
TABLE 5: RISK OF STIs DEPENDING ONDURATION AT TIME OF PRESENTATION AND EXAMINATION FINDINGS.....	
FIGURE 1: STIs AMONG THE PREGNANT SURVIVORS.....	

ABBREVIATIONS

STIs-----Sexually transmitted infections
HIV-----Human Immunodeficiency Virus
WHO-----World Health Organization
MMED-----Master of medicine
SPSS-----Statistical package for social sciences
GVRC-----Gender violence and recovery centre
UNICEF---United Nations Children’s Fund
UNAIDS---Joint United Nations Programme on AIDS
AIDS-----Acquired immunodeficiency syndrome
KDHS-----Kenya Demographic Health Survey
HVS-----High vaginal swab
CDC-----Centre for Disease Control
PID-----Pelvic Inflammatory disease
TPHA-----Treponema pallidum particles agglutination
VDRL-----Venereal Disease Research Laboratories
HSV-----Herpes Simplex Virus

ABSTRACT

BACKGROUND: Sexual assault cases have been increasing over the years, in Kenya, currently about 270 survivors are treated monthly at the Nairobi Women's hospital. At KNH 400 survivors were treated in 2011. Sexual assault increases the risk of STIs due to associated genital injuries and failure to use condoms. Data from general population indicate high prevalence of STIs, the 2007 Kenya AIDS Indicator Survey (KAIS) found Herpes Simplex Virus-2 (HSV-2) prevalence rate of 35%.

RATIONALE/ JUSTIFICATION: No studies have been done to determine the prevalence of STIs among the female rape victims in Kenya to support the recommendation of routine STIs prophylaxis in the Kenya guidelines on medical management of rape and sexual assault. This study was done to provide data to have evidence based management of sexual assault survivors.

OBJECTIVE: To determine prevalence and correlates of sexually transmitted infections among sexual assault female survivors at The Nairobi women's Hospital.

SETTING: Nairobi Women's Hospital outpatient Department.

STUDY DESIGN: cross sectional analytical study

PARTICIPANTS AND METHODS: A total of 246 female survivors of sexual assault attending the outpatient department in Nairobi Women's Hospital were recruited in the study between June 2012 and August 2012. Data was collected using a coded questionnaire and samples of urine, end cervical swab and blood was taken for tests.

MAIN OUTCOME MEASURES

Presence of STIs (trichomonas, gonorrhoea, HIV, Hepatitis B and syphilis).

DATA COLLECTION, ANALYSIS AND PRESENTATION

Data collected using an interviewer administered questionnaire and analysis was done using statistical packages for social scientists (SPSS) for descriptive statistics. Data was presented in charts, percentages, graphs and tables attended by discussion.

RESULTS

246 participants were enrolled; 63.4% of survivors presented within 72 hours, 32.5 % reported condom use while physical and genital injuries contributed to 33.3 %STIs.

Sexual assault offenders were mainly strangers (33.3%), 30.2% were relatives. The overall prevalence of bacterial sexually transmitted infections was 5.2%. HIV infection comprised 7.3%, trichomoniasis 3.2%, gonorrhoea 2%, syphilis 1.6% and hepatitis B 1.6%. The pregnant survivors were 16.5% (20), of whom 3% had HIV infection and 1.3% bacterial STIs.

CONCLUSION

The prevalence of bacterial STIs was 5.2% implying that these were transmitted during the assault

Low use of condoms, genital injuries and late presentation to hospital contributed to STIs acquisition.

RECOMMENDATION

The prevalence of HIV was 7.3% hence the need to re-emphasis on pretesting of all survivors before PrEP and PEP treatment.

CONCEPTUAL FRAMEWORK

NARRATIVE

Sexual violence is a global public health problem affecting people of various socioeconomic classes. In Kenya sexual violence is increasingly becoming common crime. Sexual violence/ assault can have a profound impact on the physical, psychological, and social wellbeing of rape survivors. In addition to immediate genital and bodily injuries, risks include HIV and other sexually transmitted infections, unwanted pregnancy, urinary tract infections, chronic pelvic pain, miscarriage, depression, substance abuse, post-traumatic stress disorder, and suicide. It also causes loss of freedoms and rights in private and public life.

The risk factors that may influence sexual violence and STIs can be grouped into four categories namely: sexual assault risk factors of acquiring STIs, socio-economic factors, socio-cultural factors and legislation (insecurity)

Sexual assault exposes the survivor to the risk of acquiring several STIs. However the risk is increased when there is no condom use, associated physical and genital injuries as well as late presentation to the hospital. STIs cause many complications which include infertility, miscarriages, chronic pelvic pains and death to name but a few. Legislations aimed at eradicating poverty, security improvement and both local and national resource mobilization would improve access to and utilization of reproductive health services. The above issues touch on gender issues and human rights including political influence, for instance sexual assault cases during the 2007/2008 post election violence were very high. Poverty directly affects a woman's bargain for safer sex. In this study the place of habitat will be used as index of poverty. Due to increased insecurity cases of gang rape are also on the increase. Socio-cultural factors encompass both community factors and socio-demographic factors that would encourage the increase of sexual violence. The female gender in an African society is taken as the weaker sex hence the inability to question men and bargain for better and safe sex. Sexual assault is a taboo in the African society; it is therefore highly stigmatized hindering early treatment seeking and legal processes. The community's beliefs and practices including religion play an important role in

health seeking behavior of the society. In a country with high maternal and child mortality rates, it is important to improve the community health education programmes as well as empowering the girl child and women.

The geographical places and the poor road networks of residence as well as their remoteness to health services also play a major role in health seeking behavior.

The type of sexual assault perpetrators will also be determined in this study. The main reasons for sexual abuse have been found to be an expression of power to the weaker gender, substances abuse mental illness and myths about HIV among others.

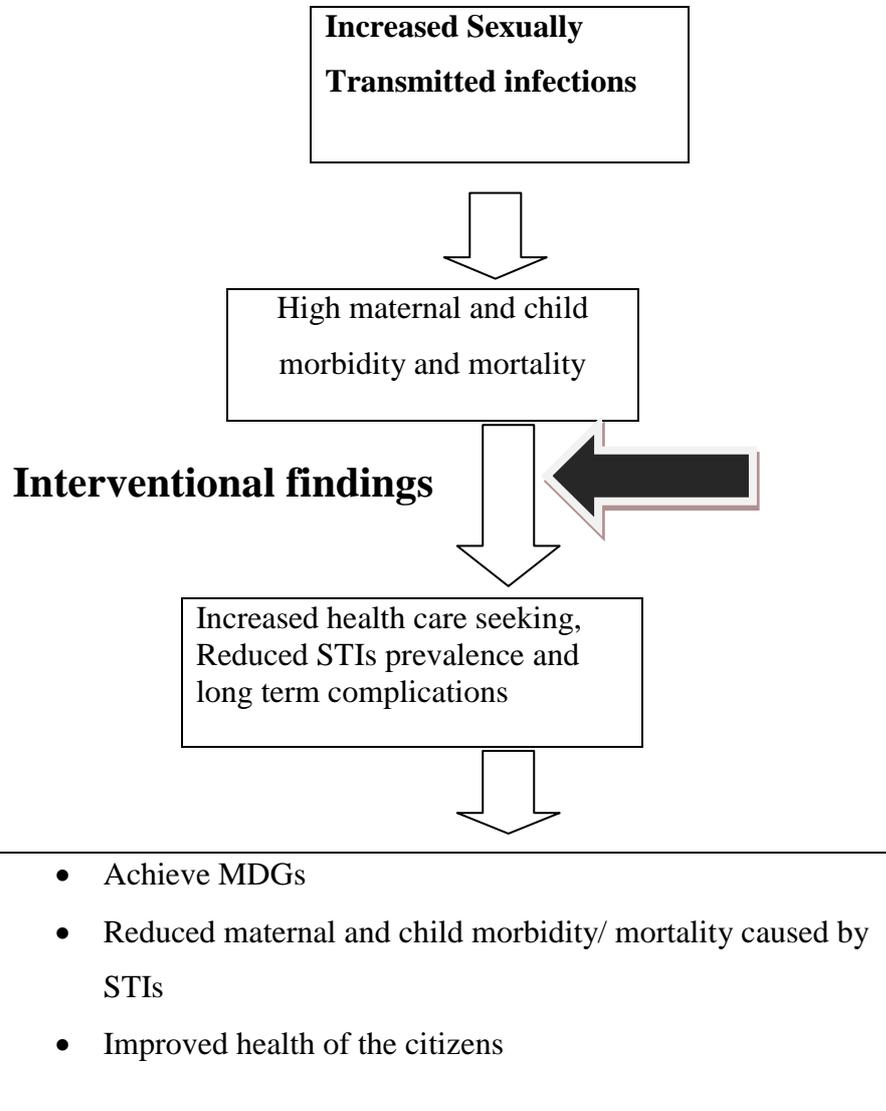
Available sources of health information determine the access and utilization of reproductive health services by both the survivors and perpetrators which include GBVRC, referral hospitals, police, justice systems and correctional centers. Kenya has a sexual offences Act in place but still very few cases are reported owing to the long legal processes hence an improvement of our legal system will play a major role in ensuring justice and correction. The health education done by GBVC (NGOs) through Hot lines 116 and creation of sexual assault survivor referral policies have shown an increase in reporting and health seeking however funding is required to increase the areas covered through other stake orders like churches, schools and organizing for Radio programmes.

All in all, it is important to involve the whole family, community and policy makers so as to have a complete healing of the country as sexual assault touches on the important pillars of our country towards the attaining of the 2030 millennium development goals.

In conclusion various socio-demographic and socioeconomic factors as well as legislation plays an important role in influencing sexual violence and sexually transmitted infections including the reproductive health seeking behavior of the community. These factors will be looked at in order to form new policies on management of sexual assault survivors and perpetrators as a whole as shown at the Nairobi Women's Hospital GBVRC.

DIAGRAMMATIC

Sexual assault factors	Socio-economic factors	Socio-cultural factors	Legislation
increasing risk of STIs <ul style="list-style-type: none"> ➤ Use of condom ➤ Genital injuries ➤ Physical injuries ➤ Late presentation 	<ul style="list-style-type: none"> ➤ Poverty ➤ occupation ➤ education ➤ poor infrastructure 	<ul style="list-style-type: none"> ➤ society beliefs ➤ stigmatization ➤ myths on STIs/ HIV ➤ poor health care seeking, late presentation 	<ul style="list-style-type: none"> ➤ insecurity ➤ long legal systems



LITERATURE REVIEW

INTRODUCTION

Sexually transmitted infections are a group of infections transmitted through sexual contact with an infected person. STIs include gonorrhea, syphilis, Chlamydia, HIV, hepatitis B, bacterial vaginosis and trichomoniasis among others. WHO estimates that throughout the world 50 million cases of syphilis and 250 million cases of gonorrhea are treated annually⁸. In Kenya, a lot has been done on HIV which has a prevalence of 7.4%, syphilis 1.7 % and HSV 36.1 % as reported in KAIS 2007. There is no data on prevalence of gonorrhea and trichomoniasis¹¹.

Sexual assault is defined as unlawful sexual intercourse with a woman by force or against her will. It includes penetration of the vagina or anus with a penis or other objects, touching the perineum, vagina, anus or oral sex¹. Sexual violence/ assault can have a profound impact on the physical, psychological, and social wellbeing of rape survivors. In addition to immediate genital and bodily injuries, risks include HIV and other sexually transmitted infections, unwanted pregnancy, urinary tract infections, chronic pelvic pain, miscarriage, depression, substance abuse, post-traumatic stress disorder, and suicide. International guidelines specify the central role of the health sector in providing comprehensive clinical care after sexual assault. In KDHS 2008/2009 29% women reported having been sexually assaulted once in the previous year⁶. Lifetime prevalence of sexual assault in the United States is estimated to be 18 percent in women and three percent in men.

In Kenya there has been rise in cases of sexual assault reported at the police crime unit, for instance in 2004 about 2908 cases were reported and in 2011 about 3000 cases were reported¹³. At the Nairobi women's Hospital- GVRC unit in 2001 at its launch 60 survivors were treated per month. This number has since increased to 270 survivors per month.

High STI prevalence has been documented among rape victims. Song K, Hwang K., Shin J, in South Korea found an overall STI prevalence of 32.91%, with higher prevalence of Chlamydia trachomatis and gonorrhea in women rape victims².

Jordan B Glauser, Julius Schakchter reported a 3-16% risk of prepubertal female rape victims acquiring C. trachomatis infection after sexual assault while 50% women

victims had bacterial vaginosis of whom 21% appeared to have been infected during the sexual assault ¹⁰.

EPIDEMIOLOGY AND BURDEN OF STIs

CDC estimates that approximately 19 million new STIs each year are reported which cost the US health care system \$16.4 billion annually and cost individuals more acute and long term health consequences ⁹. In most settings, sexually transmitted infections (STIs), including HIV, spread fastest where there is poverty, powerlessness and instability, all characteristics of displaced settings.

In Kenya, the prevalence of STIs is stated as per the type and not grouped. For instance, in the KAIS 2007, the prevalence of HSV was 36.1%, HIV 8.8%, syphilis 1.7% among female of reproductive age in Nairobi province ¹¹.

The increase in social instability and poverty in our country has led to the increase in cases of sexual assault which poses a high risk of STIs to the victims. STIs are a major cause of infertility affecting a large population in our society.

Changes in attitudes to sex and in sexual behaviours during the past years have resulted in marked increase in STIs due to promiscuity, antibiotic resistance, ignorance and stigma.

SYPHILIS

Is a sexually transmitted genital ulcerative disease caused by the bacterium *Treponema pallidum*. It can also spread to a foetus from an infected mother during pregnancy causing congenital syphilis. Syphilis presents in four different stages: primary, secondary, latent and tertiary. In Nairobi province syphilis prevalence rate is 1.7% among reproductive age group¹¹. A positive syphilis test in survivors of sexual assault indicates a prior infection and therefore puts the perpetrator at risk of getting infected.

PRIMARY SYPHILIS: is acquired via direct sexual contact with the infectious lesions of another person. Approximately 3 to 90 days after initial exposure, a skin lesion appears at point of contact which is a firm, painless, non itchy skin ulceration with a clean base and a sharp border between 0.3 and 3 cm in size. This lesion may persist for 3 to 6 weeks without treatment.

SECONDARY SYPHILIS: Occurs 4 to 10 weeks after primary infection. It may be asymmetrical reddish pink non itchy rash on the trunk and extremities including sores and palms. Other manifestations are fever, sore throat, malaise, weight loss and headaches. Rare presentations include hepatitis, optic neuritis, uveitis, kidney disease, arthritis and interstitial keratitis. Acute symptoms resolve in 3 to 6 weeks.

SYPHILIS DIAGNOSIS

1. VDRL: is a non specific serological test. It gives false positive results in measles, lymphoma, TB, malaria pregnancy and connective tissue disease
2. TPHA (treponema pallidum agglutination test) used as a confirmatory test.
3. FTA-Abs (fluorescent treponemal antibody absorption test)

The challenge in diagnosis of syphilis among sexual assault survivors is the fact that most of the test detects the antibody in blood which indicates prior infection and the TPHA test is costly.

TREATMENT

Prophylaxis antibiotic of choice is Doxycycline 100mg BD for One week. The post rape treatment given at the Nairobi Women's hospital is Azithromycin 1 gram stat.

Early infection: single dose penicillin G Im or Doxycycline or ceftriaxone 250 mg stat ¹.

Late syphilis: neurosyphilis Iv penicillin for 10 days or ceftriaxone 2gm for 10 days or penicillin G IM once weekly for 3 weeks.

TRICHOMONAS VAGINALIS

Trichomonas vaginalis is the causative agent of trichomoniasis. It accounts for 4 to 35 percent of vaginitis diagnosed in symptomatic women presenting in primary care settings.

The prevalence of trichomonas vaginalis infection in reproductive aged women in the US was best illustrated by a study in which 3754 women aged 14 to 49 years self-collected vaginal swab specimens that were subsequently evaluated for the presence of T. vaginalis using PCR. The overall prevalence of T. vaginalis was 3.1 percent, and increased with age. Prevalence was highest in non-Hispanic black women (13.3 percent) and lowest in non-Hispanic white women (1.3 percent) ⁵. The annual incidence in the United States has been estimated to be three to five million cases ⁹.

In Kenya a study done on STIs among sex workers in 1999 found a prevalence rate of 13.95 % for trichomoniasis. In another study by Kidula N. the prevalence of trichomoniasis among pregnant women was 23%.¹²

It is a flagellated protozoan which is found in the vagina, urethra and Para urethral glands of infected women.

The classical signs and symptoms include purulent malodorous thin vaginal discharge associated with burning sensation, pruritus, dysuria, dyspareunia and even post coital bleeding. In 10% to 30% of symptomatic women, the PV discharge is green frothy foul smelling. Physical examination reveals erythematous vulva and vaginal mucosa, punctuate haemorrhages with straw berry cervix.

Complications of untreated trichomoniasis include tubal infertility, cervical neoplasm, PPRM, preterm labour and increases risk of HIV infection.

DIAGNOSIS

- HVS: Endocervical specimen done a wet mount shows presence of motile trachomads is diagnostic of infection in 50% to 70% of culture confirmed cases. Post rape the motile trachomads can be identified through an endocervical swab.
- CULTURE on Diamond medium has high specificity and is recommended for patients with high PH.

TREATMENT

Usually in sexual assault survivors antibiotics prophylaxis treatment is provided, whether the test is positive or not. Mostly used are the 5- Nitroimidazole group (secnidazole 2 grams stat)¹. At the Nairobi women's hospital, secnidazole 2 grams stat is given.

GONORRHEA

Gonorrhoea is a bacterial infection. It is a sexually transmitted infection caused by neisseria gonorrhoea. This infection remains a significant cause of preventable and treatable morbidity and mortality in women. This infection present post rape indicates a high possibility of having been acquired during rape. It affects any part of the female reproductive system with the cervix being the commonest site. Other sites include the pharynx and anorectal region. WHO estimates that 62.35 million cases of gonococcal infections are diagnosed annually world wide. An estimated 700,000 new gonococcal infections occur annually in United States with higher rates in developing countries. The prevalence of gonorrhoea in Kenya in 2001 was estimated to be 1.8%¹¹. It is usually asymptomatic infection in 50% women with gonococcal urethritis accounting for 10% of cases of dysuria among urban women in absence of PID. The main symptoms of gonorrhoea in women are PV discharge, dysuria, dyspareunia, lower abdominal pains and intermenstrual bleeding.

The commonest complications are PID in 10% - 40% of women with cervicitis, chronic pelvic pains, ectopic pregnancy, infertility, pelvic abscess and gonococcal

arthritis. In pregnancy it causes PROM, preterm labour and ophthalmia neonatorum to the newborn. Gonococcal infection increases risk of HIV infection by 3-5 times.

DIAGNOSIS

1. **Gram stain:** done on HVS specimen which reviews gram negative intracellular diplococci. It has 60% sensitivity in symptomatic women.
2. **Culture:** gold standard for diagnosis of gonorrhoea using modified Thayer martin medium. Culture on endocervical specimen in symptomatic women has 65% to 85% sensitivity.

TREATMENT

Prophylaxis treatment given to sexual assault survivors is Azithromycin 1 gram stat dose.

Timely treatment of this infection is important to avoid severe morbidity and mortality. However, resistant to penicillin, tetracycline and ciprofloxacin is high. CDC recommends use of Azithromycin 1g or ceftriaxone 250mg Im stat. re-evaluation in 3 months post treatment is recommended ¹.

HIV

Human immunodeficiency virus infection is non curable retro viral disease spread through sexual intercourse, blood products and other body fluids. It can also be transmitted from mother to child during pregnancy or breastfeeding.

An estimated 1.5 million people are living with HIV in Kenya. In year 2009, 80,000 people died from AIDS related illnesses ¹¹. In Kenya its prevalence rate was 7.4% as reported in the KDHS 2008/2009 in general population while the rate in Nairobi County was found to be 8.8 % ⁶.

TRANSMISSION: HIV is transmitted through exchange of infected blood and blood products or other body fluids which include semen, vaginal secretions and breast milk. Sexual intercourse is the highest mode of transmission followed by shared needles in drug abusers. Receptive vaginal intercourse presents a risk of 0.1 to 0.2% HIV transmissions. HIV increases the risk of lower genital malignancies.

DIAGNOSIS OF HIV

Examination: physical and pelvic signs of opportunistic infections and other STIs.

Laboratory tests

CDC recommends an initial test followed by a test 3 months after the exposure.

- **Rapid test** detects HIV antibodies in serum
- **Enzyme Linked Immunosorbent Assay (ELISA)** detects antibodies to HIV in serum

A positive HIV test post sexual assault indicates a prior infection hence puts the perpetrator at higher risk of acquiring the infection.

TREATMENT OF HIV

Goals of care include maintenance of general health as long as possible; treatment with antiretroviral active against HIV; prevention and treatment of secondary opportunistic infections and prevention of spread of infection to sexual partners and offsprings.

PREVENTION

- The best method is abstaining from sex.
- Use of condoms
- Change of sexual and community behaviour and practices.
- Health education on STIs and HIV.
- Prevention of mother- to -child transmission of HIV
- Male circumcision
- Increase availability and access to counselling / testing
- Provision of PEP especially in sexual assault survivors who are given combivir BD or tenofovir 300 mg and lamivudine 150mg OD for 28 days.

HEPATITIS B INFECTION

Hepatitis is an infectious infection caused by Hepatitis B virus (HBV) which infects human liver. Approximately 2 billion people in the world have been infected with hepatitis B virus; this includes 350 million chronic carriers of the virus. Its transmission is through exposure to infectious blood or body fluids including semen and vaginal fluids.

A positive Hepatitis B test in a sexual assault survivor indicates a prior infection and hence the perpetrator is at risk of infection.

SIGNS AND SYMPTOMS

ACUTE ILLNESS: acute infection with GBV causes liver inflammation, vomiting, jaundice and acute liver failure leading to death. Hepatitis B has also been linked to development of membranous glomerulonephritis (MGN).

CHRONIC INFECTION: chronic hepatitis B causes liver cirrhosis and liver cancer- a fatal disease with poor response to current chemotherapy.

DIAGNOSIS

HBSAg: serological test though its presents in both acute and chronic infection. A positive test at the time of screening post assault would indicate prior infection.

IgM ab to Hepatitis B core antigen (IgM anti-HBc) is diagnostic of acute or recently acquired HBV infection.

TREATMENT

Acute Hepatitis B infection treatment is mainly supportive

Chronic HBV infection: antiretroviral treatment is given for six weeks

PREVENTION

- Hepatitis B vaccine: given at zero, one and six months IM on the deltoid muscle. This is the commonly used regime for the sexual assault survivors.
- Hepatitis B Immune globulin (HBIG): it offers 3-6 months protection from HBV.

RATIONALE/JUSTIFICATION

Sexual assault cases have been on the increase over the years in Kenya, with this increase there is need to know the prevalence of sexually transmitted infections among this high risk group. At the Nairobi Women's hospital available data shows an increase in the sexual assault cases from 60 per month in 2001 to 270 cases currently being treated monthly. At the Kenyatta national hospital GVRC 332 patients were treated in the year 2008 and in 2011 about 400 patients were treated.

Sexual assault causes several complications which include family break ups, loss of liveliness, financial costs, STIs, unwanted pregnancies, physical injuries and psychiatric illness among others.

Sexually transmitted infections cause many complications including PID, infertility, ectopic pregnancies, congenital infections and death among others.

No studies have been done to determine the prevalence of STIs among female rape survivors in Kenya to support the recommendation of routine STIs prophylaxis given post rape¹. A lot has been researched on HIV and syphilis in general population with a prevalence of 7.4% and 1.6% respectively, extrapolating these findings puts the sexual assault survivor at a higher risk to acquire STIs. This study will provide data to aid in evidence based management of sexual assault survivors.

The prevalence and correlates of STIs among female sexual assault survivors would provide data to sustain or change important policies in the post rape management of survivors as it describes the risk factors as well as the prevalence of bacterial STIs and pre existing STIs.

STUDY QUESTION

- What is the risk of STIs after sexual assault?
- What are the correlates of STIs among sexual assault female survivors?

BROAD OBJECTIVE

To determine the prevalence and correlates of sexually transmitted infections among female survivors of sexual assault at The Nairobi women's hospital.

SPECIFIC OBJECTIVES

1. To determine the prevalence of STIs (Gonorrhoea, Trichomoniasis , Syphilis, Hepatitis B and HIV) among female sexual assault survivors at Nairobi women's Hospital
2. To describe the correlates/ risk factors of STIs among survivors (condom use, duration prior to treatment, time of assault, perpetrators, residence)

DESIGNS AND METHODOLOGY

STUDY DESIGN

This was a cross- sectional analytical study targeting sexual assault survivors receiving care at the Nairobi women's hospital.

STUDY SITE

The Nairobi women's hospital is a private institution set up in 2001. It is located in Nairobi province, West lands County in Hurlighurm. It offers health services to the women and their families and specialises in obstetrics and gynaecology as well as other specialities of medicine. The hospital has three branches Hurligham, Adams and Ongata Rongai which offer both inpatient and outpatient services. The bed capacity for all the three branches is over 200 in maternity, paediatrics, medical and surgical wards.

The Gender Violence Recovery Centre (GVRC), a charity trust of The Nairobi Women's Hospital offers specialised medical treatment and psychological support to the survivors of sexual assault and domestic violence since 2001 at no cost. Since 2001, over 18,000 survivors have been treated with up to 260 survivors per month being treated currently.

The catchment area for the Hospital is Nairobi County and neighbouring counties with the biggest population of sexual assault survivors coming from the slums (Kibera and Mathare)

STUDY POPULATION

The study population comprised female sexual assault survivors seeking treatment at the Nairobi women's hospital outpatient department.

STUDY PERIOD

The study was carried out between June 2012 and August 2012.

SAMPLE SIZE

$$n = \frac{Z^2 p \{1-p\}}{d^2}$$

n=Sample size.

Z=Standard error from the mean corresponding to 95% confidence level=1.96

P= 20 % taken to be estimated prevalence of STIs (this is the estimate of trichomoniasis based on a study by Fonck K, Kidula N, Jaoko W, on vaginal discharges in female in Nairobi, 2000). This was the only available local study done on STIs hence the decision to use the prevalence estimate of 20%.

d=Precision/ reliability with which to determine p =5%
 $1.96^2 \cdot 0.20(1-0.20)/0.05 \times 0.05$

The sample size calculated using the above formula was **246**.

SAMPLING PROCEDURE

Participants were recruited from the outpatient department at Nairobi Women's hospital between the months of June to August 2012. Eligible participants were enrolled into the study and assigned a study number until sample size of 246 was achieved.

INCLUSION CRITERIA

Women and female children who were sexually assaulted penovaginally with signed consent to participate in the study.

EXCLUSION CRITERIA

- Oral, anal or object sexual assault and those who did not consent formally

- Those survivors who were very sick.
- Children under 5 years

RECRUITMENT AND PROCEDURES

Participants were recruited into the study using the inclusion/ exclusion criteria by the investigator or research assistant sequentially until the required sample size was achieved.

A partially coded questionnaire was administered by the researcher or research assistant to the sexual assault survivors at the out patient department.

Two milliliters of blood was removed from the ante-cubital vein and put in a plain bottle and taken to the Nairobi women's hospital laboratory for HbsAg, HIV test and VDRL to determine prior infection.

Each participant was done an HVS which was examined as a wet preparation for trichomonas vaginalis, spermatozoa, pus cells and epithelial cells. A gram stain was also done.

Each participant was given a sterile plastic container to collect a midstream urine specimen for microscopy.

All the results were entered in the laboratory form and were communicated to the participant immediately and any disease diagnosed was treated accordingly.

All participants were offered post exposure treatment and prophylaxis of STIs as per the Kenya National medical management of sexual assault survivors guidelines: PEP, Azithromycin, secnidazole, postinor 2 and Hepatitis B vaccine.

OUTCOME MEASURES

- Presence of STIs
- positive tests for syphilis, HBV, HIV indicated prior infections

TRAINING PROCEDURES

Two nurses working at The Nairobi Women's Hospital were re-trained in history taking and physical examination and consent taking, they were also taught on how to administer and fill the questionnaire in a standard manner.

QUALITY ASSURANCE

Two nurses were recruited as research assistants. Laboratory tests were carried out by laboratory technologists employed at the hospital. For every 10 tests a sample was picked randomly for retesting at the KNH laboratory and both results compared.

DATA COLLECTION TOOL

Data was collected and recorded in a partially coded questionnaire that was administered to the study population by the research assistant.

The questionnaire was divided into sections:

1. Section A- socio-demographic data to describe the study population.
2. Section B- Past Obstetrical and Gynaecological history. This section gave information on parity, prior STIs infection and treatment and time of last conceptual sex.
3. Section C- Factors influencing sexual assault provided information on the date and time of assault, perpetrator and place.
4. Section D-outcomes of tests

DATA MANAGEMENT AND STATISTICAL ANALYSIS

Data was entered into appropriate analytical packages including SPSS. Descriptive statistics such as frequency distribution and chi square were used to analyze data. Results were presented in charts, graphs, percentages and tables together with discussion and recommendations.

ETHICAL CONSIDERATIONS

Ethical approval was sought from Kenyatta National Hospital Ethics and Research Committee. Permission to carry out the study was also granted by the management committee of (GVRC) The Nairobi Women's Hospital.

Consent was obtained from the study population before administering the questionnaire. For children less than 12 years the guardian/ parent gave consent while for those over 12->18 years an explanation of the study was given and they were given the opportunity to choose whether to participate in the study and consent was signed by the parent/ guardian.

All interviews were carried out in private and confidentiality was ensured throughout the study.

All procedures pertaining the management of post rape survivors as per the Kenya National Guidelines on medical management of rape was carried out, these include urine sample collection, endocervical swab and blood samples.

RESULTS

Between the months of June and August 2012, 246 participants were enrolled. Majority of enrolled participants were aged 15 to 20 (24.4 %), 95 (78.5%) were single and had attained secondary school education (40.7 %). Those in employment were 34.6%.

TABLE 1: SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE STUDY POPULATION (n= 246)

characteristics	no.	%
Age:		
5-10 yrs	55	23.4
>10 - 15 yrs	49	19.9
>15 - 20 yrs	60	24.4
>20- 25 yrs	37	15
>25 yrs	45	17.3
Marital status: (n- 121)		
Single	95	78.5
Married	20	16.5
Divorced/separated	4	3.3
Widowed	2	1.7
Level of education(n-246)		
Pre-primary	27	10.9
Primary	82	33.4
Secondary	100	40.7
University/College	37	15.0
Occupation: (n- 246)		
Housewife	12	4.8
Employed	84	34.6
Business	25	10.2
children	124	50.3

TABLE 2: HISTORY OF PRIOR STIs TREATMENT AND CURRENT PRESENTING COMPLAINTS

	NUMBER:	%
last treatment for previous STIs:		
n- 246		
6 months - 1 year	10	4.1
>1 year - 2 years	6	2.4
never	230	93.5
Current presenting complaints:		
n-246		
abdominal pains	76	30.9
genital ulcers	10	4.1
dysuria	57	11.4
vaginal discharge	48	19.5
none	55	34.1

Table 2 above reports previous history of STIs treatment and presenting complaints of the sexual assault survivors at the time they presented to the hospital.

Majority of women had never been treated for STIs (93.5%), 4.1 % had been treated for STIs six months prior to assault. This meant that most of the infections were acquired during the sexual assault.

Majority presented with complaints of abdominal pains (30.9%), vaginal discharge 19.5%, 11.4 % had dysuria and genital ulcers 4.1%.

TABLE 3: RISK FACTORS ASSOCIATED WITH SEXUAL ASSAULT AND STIs

Situations surrounding sexual assault:	No. of survivors: n	Percentage %
Time:		
Daytime	70	28.5
Night	176	71.5
Place:		
In a house	122	49.5
On wayside	124	50.5
Perpetrator:		
Relative	74	30.2
Neighbour	30	12.2
Friend	50	20.3
Stranger	82	33.3
Thugs	10	4
Residence		
slums	160	65.5
Non slums	86	35.5
Use of condom		
Yes	80	32.5
No	166	67.5

Table 3 shown above indicates the various risk factors associated with sexual assault and STIs.

Seventy one percent of the sexual incidences were reported to have occurred at night while majority perpetrators were strangers (33.3%). No condom use reported in more than half (67.5%) of the cases.

TABLE 4: LABORATORY TESTS RESULTS

Laboratory tests:	No :n- 246	%
HBsAg:	4	1.6
HIV:	18	7.3
VDRL:	4	1.6
Trichomonas vaginalis:	8	3.2
Gonorrhoea:	5	2.0

Table 4 above reports the number of positive STIs on laboratory tests.

4 (1.6%) had Hepatitis B, 18 (7.3%), HIV 7.3 %, VDRL 1.6%, 3.2 % trichomonas vaginalis and 2% gonorrhoea.

Sixteen point five percent female survivors were pregnant (20).

TABLE 5: RISK OF STIs DEPENDING ON DURATION AT THE TIME OF PRESENTION AND EXAMINATION FINDINGS

	Number (n-246)	%	Presence of STIs (n- 39)	%	P value
Duration					
>72 hour	156	63.4	10	25.6	0.064
7days	50	20.3	13	33.3	0.260
2 weeks	40	16.3	16	41.1	0.401
Examination findings					
Physical injury.	60	24.4	13	33.3	0.217
Vaginal tears	24	9.7	12	30.8	0.500
Anal tears	6	2.4	2	5.1	0.330
Vaginal discharge	40	16.3	12	30.8	0.300

Table 5 above reports the duration at hospital presentation and the examination findings by as well as the STIs in each group.

Majority of the survivors presented to hospital within 72 hours of rape (63.4%) and this group was found to have the least STIs infections. Physical body injuries accounted for 24.4% and contributed to 33.3 % STIs.

There was no statistical significance as P value was >0.05.

FIGURE 1: STIs AMONG THE PREGNANT SEXUAL ASSAULT SURVIVORS

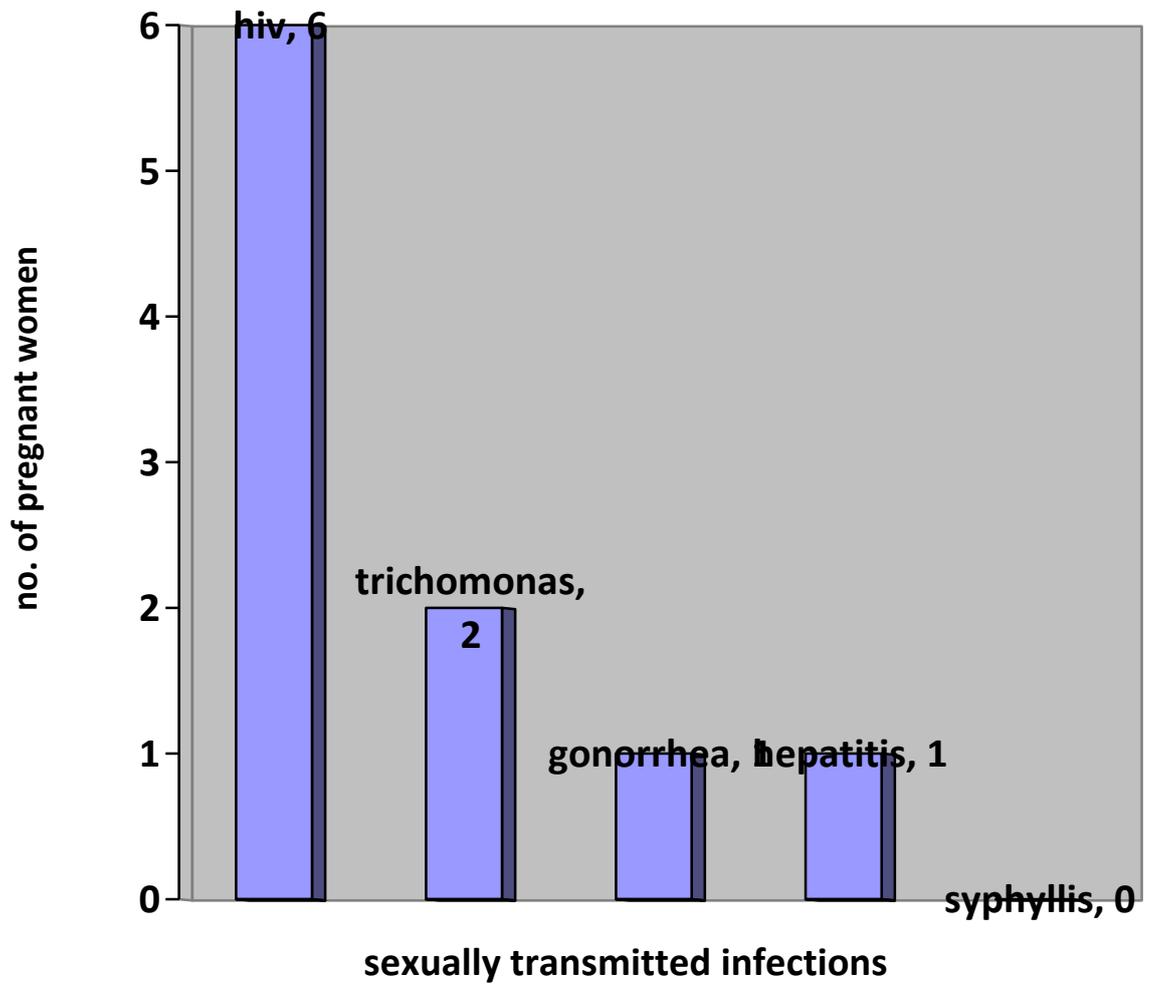


Figure 1 above indicates the number of pregnant survivors infected by STIs. Twenty (16.5 %) female survivors were found to be pregnant out of a total of 121 females tested. Six (3%) had HIV infection and 1.3 % (3) had trichomoniasis and gonorrhoea.

DISCUSSION

We found an overall prevalence of 15.9% of sexually transmitted infections among female sexual assault survivors at the Nairobi Women's hospital. The relative prevalence of HIV, Trichomoniasis, gonorrhoea, syphilis and Hepatitis B infections was 7.3%, 3.2%, 2 %, 1.6% and 1.6% respectively. The prevalence of bacterial STIs (gonorrhoea and trichomoniasis) was 5.2%, indicating that the infections were acquired following the sexual assault. The prevalence of HIV, Gonorrhoea and syphilis was comparable to the KDHS 2008/2009 and KAIS findings of 7.4 %, 1.8% and 1.7% respectively^{6, 11}. This finding could be because syphilis and HIV infections indicated pre-existing infections. The prevalence of gonorrhoea was comparable to the prevalence reported in KAIS 2007 for the general population¹¹. Literature review search did not reveal any previous study in the same setting and therefore we did not have any previous local results to compare. However a study done in 2008 by Jo S, Shin J et al on prevalence and correlated factors of STDs among female rape victims in South Korea found a prevalence trichomoniasis was 28.85% and gonorrhoea 6.27%.² The results obtained from our study showed lower prevalence of gonorrhoea and trichomoniasis compared to the study done in South Korea. This could be due to the low infection among the perpetrators and the improved health care systems and the aggressive management of STIs. The prevalence of both STIs has dropped as compared to that of general population though a lot of effort need to be put towards eradication of bacterial STIs as well as prevention measures. It is also important to offer prophylaxis treatment to the sexual assault survivors.

The HIV prevalence among the pregnant survivors was 3.3% while trichomoniasis and gonorrhoea accounted for 3%. These findings put the pregnant survivors at risk of miscarriages, transmission of infections to the fetus as well as transmission to their partners .A study by Kidula N. on vaginal discharges among pregnant women in Nairobi (2000) found the prevalence of trichomoniasis to be 23% while in our study it was 1.3%, this showed a significant drop in the prevalence over ten years¹². However prophylaxis and treatment is important.

The prevalence of Hepatitis B infection was found to be 1.6 % among female survivors of sexual assault. This was taken as a new finding since there was no local and international literature found to compare this finding .Hepatitis B infection is also known to be transmitted through body contact and body fluids and not primarily

sexual therefore it puts the general public at risk of the infection which has deadly complications like liver cancer among others. This indicates the importance of Hepatitis B screening and prophylaxis treatment as well as putting those infected on treatment and follow up programme.

The study also identified several risk factors of acquiring STIs post sexual assault. Failure to use condoms was reported among 166 survivors (67.5%), this was a high percentage putting the survivors at a greater risk of acquiring STIs in case the perpetrator had the infection. In Kenya condom use is relatively low with about 40.6% of the population reported to have ever used condoms in the KAIS 2007 report¹¹. Sanchez et al demonstrated effectiveness of condoms in preventing gonorrhoea, Chlamydia and trichomoniasis among women with a 62% and 26% reduction in risk of acquiring gonorrhoea and trichomoniasis respectively.¹³

Physical and genital injuries contributed to 33.3% and 30.8 % respectively. Genital injuries allow easy penetration of the infecting organism through the mucosa.

Sexual assault offenders were mainly strangers (33.3%), 30.2% were relatives, 12.2 % neighbors while 4% were thugs. Overall 50.2% offenders were people well known by survivors which has a great implication in terms of delayed presentation to hospital and a higher risk of acquiring STIs due to fear of reporting the perpetrators.

The age group at highest risk of sexual assault was between 15 and 20 years; these were the young girls in their adolescence and in school hence increased cases of teenage pregnancies, STIs and long term complications like infertility.

The WHO and the Kenya medical treatment of sexual assault guidelines recommend empirical prophylactic treatment of STIs in sexual assault survivors^{1, 8}. Our study findings strongly support the need to give prophylaxis treatment to sexual assault survivors as well as the perpetrators.

STUDY LIMITATIONS

- This was a cross sectional study hence sero conversion post rape could not be determined as no follow up tests were done.
- This study was done at The Nairobi women's hospital which is situated in urban area therefore it may not reflect the situation at the rural set up.

- Late presentation to hospital where 20.3 % and 16.3 % reported 7 days and 14 days post rape may have contributed to higher STIs rates.

CONCLUSION

The prevalence of bacterial sexually transmitted infection among female sexual assault survivors at The Nairobi Women's Hospital was 5.2%, these infections were highly possible to have been transmitted during the sexual assault. The prevalence of HIV infection was 7.3% which compares to the current prevalence of the normal population. Hepatitis B infection was found to be high (1.6%) which puts the perpetrator at risk of infection.

Low condom use coupled with both physical and genital injuries put the survivors at a higher risk of STIs post rape.

Late presentation to hospital contributed to high rate of STIs.

More than half of the perpetrators were well known to the survivors.

RECOMMENDATIONS

- This study found a high rate of HIV prevalence (7.3%) therefore it should be reemphasized that HIV test be done on all survivors prior to PrEP and PEP treatment.
- Bacterial STIs prevalence was found to be high at 5.2% therefore antibiotic prophylaxis post rape should be continued.
- Physical and genital injuries were found to be important risk factors of STIs in sexual assault survivors therefore strict punishments as well as corrective measures should be put in place to help the perpetrators become better people in the society.
- Perpetuators should also be given treatment; this is supported by the high prevalence of HIV, syphilis and Hepatitis B infections which puts these people at risk of getting infected.

FUTURE RESEARCH AREAS

- Cohort studies should be carried out where the survivors are followed up over a certain period in order to determine the STIs seroconversion rate and prevalence in this group.

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APPENDIX 1

CONSENT FORM

Study number -----

GVRC number -----

Introduction

Hello, my name is -----I am working with Dr **Isika**, a postgraduate student from the University of Nairobi, department of Obstetrics and Gynecology. We are carrying out a study entitled “To determine the prevalence of sexually transmitted infections among sexually assaulted women and female children at The Nairobi Women’s Hospital”. The objectives of this study are to determine the prevalence of STIs among sexually assaulted women and female children at the Nairobi Women’s Hospital, to determine correlates of STIs among survivors and describe sexual assault situations.

Procedure

The procedure of carrying out the study will be as follows: participants will be recruited who will sign an informed consent. A questionnaire will then be filled out after which two milliliters of blood will be removed from the antecubital vein and put in a plain bottle and sent to the Nairobi Women’s hospital laboratory for HIV, syphilis and hepatitis B tests. Each participant will be given a plastic container to put a sample of urine which will be examined microscopically for pus cells, epithelial cells, leucocytes and bacteria. A high vaginal swab (HVS) or vulval swab in female children will be taken for microscopy and culture. No other tests will be carried out on the samples of blood and stool apart from the ones outlined above.

We are requesting you to participate in the study. You are free to choose to participate or not to participate, you can refuse to answer any questions during the interview or withdraw from the study at any point and there will be no penalty, you will be given all the care you require. All the information you provide will be treated with utmost confidentiality.

Risks and benefits

We do not anticipate any risks to the participants as the only procedures to be carried out are as outlined above. You will benefit from this study due to the fact that any disease found during the examination of urine, HVS and blood will be treated

accordingly or referred for further investigation and treatment where necessary. The information gathered will also help to improve services provided to sexually assaulted women and female children. You will not be charged any extra money for the laboratory tests to be carried out during this study and also there will be no compensation for participating in this study as the procedures will be carried out during the normal sexual assault victims' care.

Investigator contacts

Any questions regarding this study may be directed to Dr ISIKA on telephone number 0721404445.

Thank you.

I, GVRC number -----having been informed about the study/having read all the above and understand all what it entails, do willfully consent to participate in the study.

Client signature/Thumb print

Investigator who informed/discussed with client

Date-----

Date

FOMU YA IDHINI

Fomu namba -----

GVRC namba -----

Habari gani? Mimi ni ----- Nafanya kazi na DKT ISIKA, mwanafunzi wa shahada ya uzamili ya udaktari katika chuo kikuu cha Nairobi, idara ya uzazi na magonjwa ya wanawake. Sisi tunatafiti uwezekano wa mama na watoto wa kike waliobakwa katika hosipitali ya wamama Nairobi kuwa na magonjwa ya zinaa.

Jinsi ya kufanya utafiti

Jinsi tutakavyofanya utafiti huu ni kama ifuatavyo: Washiriki watatia sahihi fomu ya idhini kwa hiari baada ya kupewa maelezo. Fomu ya maswali Fulani itajazwa kisha damu kiasi cha mililita mbili itolewe kutoka mshipa wa damu wa mkono. Hii damu itawekwa kwenye chupa halafu ipelekwe kwenye mahabara ya kuchunguza damu ya wanawake Nairobi. Damu itafanyiwa uchunguzi kubaini uwepo wa magonjwa ya zinaa kama viruzi za ukimwi, kaswende na pepo punda mwilini mwako . Washiriki pia watapewa chupa ya plastiki waweke mkonjo kitakachopelekwa mahabara ambako kitakaguliwa kubaini ikiwa kina viruzi za magonjwa ya zinaa. Pia njia ya uzazi itachukuliwa samboli kubaini kuna mbegu za kiume au viruzi zozote. Hakuna vipimo vingine vitakavyofanywa katika damu au mkonjo isipokuwa vile vimeandikwa hapo juu.

Tunakuuliza kwa hisani yako ushiriki katika utafiti huu. Kuwa huru kuamua kushiriki au kutoshiriki na pia unaweza kuamua kutojibu swali lolote au kutoka kwa utafiti huu wakati wowote na hakuna adhabu ya aina yoyote. Utapewa huduma yoyote utakayohitaji. Taarifa zote utakazotupatia zitatumzwa na zitakuwa siri.

Hatari na manufaa ya utafiti huu

Hatutarajii kuwa na hatari yoyote kwa washiriki kwa kuwa utafiti utafanywa jinsi imeandikwa hapa na hakutakuwa na mambo mengine kamwe. Utapata manufaa kutokana na utafiti huu kwa kuwa magonjwa yoyote yatakayogunduliwa wakati wa ukaguzi wa damu na mkonjo yatatibiwa vilivyo au mshiriki atumwe kwa uchunguzi zaidi na matibabu. Taarifa tutakayokusanya pia itatusaidia kuboresha huduma kwa akina mama walibakwa. Hautalipishwa malipo yoyote ya ziada ya kufanyiwa vipimo vya damu na mkonjo vitakavyohitajika katika utafiti huu na pia hautalipwa kushiriki utafiti huu kwa vile utafiti huu utafanywa wakati wa kawaida wa kutembelea hosipitali ya wamama Nairobi.

Nambari za mtafiti mkuu

Kama una swali lolote la ziada kuhusu utafiti huu unaweza kuwasiliana na DKT ISIKA kwa simu namba 0721404445.

Asante sana.

Mimi, GVRC namba ----- nimepewa taarifa kamili kuhusu utafiti huu Kwa vile nimesoma kwa makini maelezo yote kuhusu utafiti hapo juu, nimeelewa vizuri kinachonipasa na natoa idhini ya hiari ya kushiriki katika utafiti huu.

Sahihi ya mteja/dole gumba

Tarehe

Mtafiti aliyetoa maelezo kwa mteja

Tarehe

APPENDIX 2

QUESTIONNAIRE

1. Date -----

2. Patient study number -----

3. Patients GVRC number -----

SECTION A: SOCIO-DEMOGRAPHIC CHARACTERISTICS

4. Age [in completed years] -----

5. Marital status [insert code in box]

1. Single
2. Married
3. Divorced/separated
4. Widowed
5. Child

6. Level of education [insert code in box]

1. None
2. Primary
3. Secondary
4. University/college

7. Occupation [insert code in box]

1. Housewife
2. Employed
3. Business [specify]
4. Student
5. Child

8. Residence -----

9. Religion [insert code in box]

1. Christian
2. Muslim
3. Other [specify]

SECTION B: PAST OBSTETRICS/GYNAECOLOGICAL HISTORY

10. LMP ----/----/-----

11. Parity ----- + -----

12. Was she diagnosed to have any STIs in previous 1 year?

1. Yes
2. No
3. Was not tested

13. If the answer to 12 above is yes, did she take treatment?

1. Yes
2. No

14. If the answer to 13 above is no, what was the reason?

1. Could not afford medicines
 2. Was told treatment is not safe
 3. Others, specify-----
-

15. Does she have any complaints currently?

1. Yes
2. No

16. If the answer to 15 above is yes, which ones?

1. Abdominal pains
2. Genital ulcers
3. Dysuria
4. Vaginal discharge

17. When was the last time she was treatment for STIs/ vaginal discharge?

1. Six months – one year
2. One year – 2 years
3. Never

18. When was the last conceptual sexual contact? -----

SECTION C: FACTORS INFLUENCING SEXUAL ASSAULT

19. Time and date of incident-----

20. Where did the incident take place?

- a. In a house
- b. On wayside

21. Who was the perpetrator? -----

- a. Relative
- b. Neighbour
- c. Friend
- d. Stranger
- e. Thugs

22. Was a condom used? -----

- a. Yes
- b. No

23. Was the incident reported?

- a. Yes
- b. No

ON EXAMINATION

GENERAL EXAMINATION

VAGINAL EXAMINATION-----

APPENDIX 3

SECTION D: OUTCOMES

LABORATORY FORM

Study number -----

GVRC number -----

URINE

Colour-----

PH -----

Pus cells/hpf -----

Spermatozoa-----

Nitrites-----

Bacteria-----

Red blood cells -----

Epithelial cells-----

BLOOD

HBSAg -----

VDRL -----

HIV-----

HVS/ VVS

Bacteria -----

Epithelial cells-----

Pus cells/ hpf-----

Yeast cells-----

Red blood cells-----

Trichomonas-----

Spermatozoa-----

PDT-----

