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AN OVERVIEW AND ANALYSIS OF REPORTED CASES OF SOME SELECTED SEXUALLY TRANSMITTED INFECTIONS (STIS): A CASE STUDY OF FEDERAL MEDICAL CENTER, LOKOJA (2005 – 2014)

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ABSTRACT

This work is an overview and analysis of reported cases of some selected sexually transmitted infections (STIs), a case study of Federal Medical Centre, Lokoja (2005 – 2014). The selected STIs are gonorrhea, syphilis, urethritis and HIV. The symptoms, causes, prevention and control measures of STIs were generally discussed. A test of incidence of occurrence of STIs in respect to gender was carried out using Chi – square test statistic. From the result of the analysis, $\chi^2_{cal} = 8.831 > \chi^2_{tab} = 7.819$*. We thus reject the hypothesis under consideration* (H_0) *and conclude that the incidence of occurrence of sexually transmitted diseases (STIs) is dependent on the of gender of individuals. That is the reported cases of the incidence of occurrence of the diseases depend on gender.*

Keywords: *Sexually, transmitted, Infections, Virus , bacteria, parasite*

INTRODUCTION

Sexually transmitted infections (STIs), also referred to as sexually transmitted diseases (STDs) and its effects now poses a lot of concerns in our today's societies, our nation Nigeria and the world at large. They are commonly spread by sex, especially through vaginal intercourse, anal sex and oral sex. Most STIs initially do not cause symptoms. Medically, infections are only called diseases when they cause symptoms. That is why STDs are also called STIs. However, it is very common for people to use the terms STDs even when there are no signs of disease. The absence of symptoms to a large extent results in a greater risk of passing the disease on to others. Symptoms and signs of the disease may include vaginal discharge, penile discharge, ulcers on or around the genitals, and pelvic pain. STIs acquired before or during birth may result in poor outcomes for the baby. Some STIs may cause problems with the ability to get pregnant. STIs are caused by over 30 different bacteria, viruses, fungi, and parasites pathogenic to man. Bacterial STIs include Chlamydial infections, gonorrhea or gonococcal infection, chancroids, granuloma inguinale and syphilis among others. Viral STIs include genital herpes, HIV/AIDS, Viral hepatitis (Hepatitis B virus), and genital warts among others. Fungal STIs include candidiasis and Parasitic STIs include crab louse, scabies, Trichomoniasis (caused by protozoan parasites) among others. While usually spread by sex, some STIs can also be spread by non – sexual contact with contaminated blood and tissues, breastfeeding or during child birth. STI diagnostic tests are

easily available in the developed world but this is often not the case in the developing world (https://en.m.wikipedia.org/wiki/sexually transmitted infection).

STIs are very common and more than half of the people will get atleast one at some time in life. The good news however is that we can protect ourselves and each other from STIs. Practicing safer sex allows one to reduce the risk of getting STIs. And if you've done anything that puts you at the risk of infection, getting tested allows you to get the required treatment you may need **(www.plannedparenthood.org/learn/stds-hiv-safer-sex).**

At the moment, sexually transmitted diseases are the commonest infectious diseases of the world. The World Health Organization's statistics recorded 200 million cases of Gonorrhea and 50 million cases of Syphilis for the year 1982. Many millions of the second generation STIs such as Chlamydia infections and virus infections were also recorded in both the developed and the third world countries. Despite the progress made in the methods of diagnosis and treatment, the incidence of STIs has soared to almost "epidemic proportions" throughout the world during the past twenty years (www.islamset.net/hip/anvir_adam.html).

In 2008, it was estimated that 500 million people were infected with either syphilis, gonorrhea, Chlamydia or Trichomoniasis. At least an additional 530 million people have genital herpes and 290 million women have human papilloma virus. STIs other than HIV resulted in 142000 deaths in 2013. In the United States, there were 19 million new cases of STIs in 2010. Historical documentation of STIs date back to atleast the Ebers Papyrus around 1550 BC and the old Testament. There is often shame and stigma associated with these infections (https://en.m.wikipedia.org/wiki/sexually transmitted infection).

The sexually transmitted diseases can be categorized into three. The first category is referred to as the first generation (traditional) sexually transmitted diseases and these include gonorrhea, syphilis, and chancroids. The second category is referred to as the second generation sexually transmitted diseases which are Chlamydial infections and some viral infections. The third category, also referred to as the third generation sexually transmitted diseases include AIDS (Nancy et al, 2012)

STIs have become major public health problems to most countries of the world, including Nigeria on the account of their frequency, impact on maternal and infant health and their special consequences as well as their economic cost in terms of health expenditure and cost of productivity. It has a serious effect on pregnancy, and new born which may lead to miscarriage, failure of development of new baby, blindness, congenital defects etc. The implication in woman such as pelvic inflammatory disease, ectopic pregnancy, infertility and chronic ill health are caused by sexually transmitted diseases where the incidence of undiagnosed or poor treated cases is very high.

STATEMENT OF PROBLEM

At the local level and the nation at large, STIs have killed many people, yet so many people don't believe its existence. The rapid spreading of these deadly diseases (STDS) does not mean that both internal and external bodies and even corporate organizations are not working to remedy the issue. For instance, the Federal Ministry of Health has warns that total abstinence and mutual fidelity remains the best protective measure against STIs. It even supported the introduction of sex education and the use of condom as a program in most of our media, such as newspaper, radio, television etc in order to educate the poor masses on the subject matter and how to avoid contacting this deadly disease. Despite all these efforts, it will sound unbelievable even at the moment that some people mainly the youths of today kept adamant on the warnings and dangers of being a prostitute, a homosexual, a hetero sexual and equally having unprotected sexual intercourse. The World Health Organization (WHO) had warned that partners should be truthful to one another and take preventive measures. That notwithstanding, a lot need to be done to help the masses to reduce the rate of sexual act and sexual promiscuity.

The aims of this study are to add more heralds to the awareness of the existence of STIs in respect to mode of transmission, symptoms and preventive measures as well as testing whether the incidence of sexually transmitted infections (STIs) is independent of gender.

SIGNS AND SYMPTOMS

Not all STIs are symptomatic, and symptoms may not appear immediately after infection. In some instances, a disease can be carried with no symptoms, which leaves a greater risk of passing the disease on to others. Depending on the disease, some untreated STIs can lead to infertility, chronic pain or even death. The presence of STI in prepubescent children may indicate sexual abuse (Hoffman, 2012)

EXAMPLES OF SOME SEXUALLY TRANSMITTED INFECTIONS

Some examples of sexually transmitted infections are:

Gonorrhea
Chancroids
Chlamydia
Granuloma Inguinale
Mycoplasma genitalium
Mycoplasma hominis
Ureaplasma infection
Urethritis
Viral hepatitis
HPV (Human Papilloma virus)
MCV (Molluscum contagiosum virus)
Scabies
Lypho granuloma venereum
Herpes simplex
Trichomoniasis
Candidiasis
HIV (Human Immunodeficiency virus)
Syphilis
Herpes

The Federal Medical Centre, Lokoja (FMC) is the case study for this work and the data were collected for the years 2005 – 2014. Although there are so many types of sexually transmitted infections (STIs), this study chooses to work on the types that are prevalent in the study area based on their reported cases. The types to be considered are gonorrhea, syphilis, urethritis and HIV.

CAUSES AND SYMPTOMS OF THE STIs UNDER STUDY:

GONORRHEA

Gonorrhea is caused by the bacterium called Neisseria gonorrhoeae, which lives on moist mucous membranes in the urethra, reproductive tract, vagina, rectum, mouth, throat, fallopian tube, and eyes. The infection can spread through contact with the penis, vagina, mouth or anus. Symptoms of gonorrhea usually appear 2 to 5 days after contact with an infected partner. However, some men might not notice symptoms for up to a month. Symptoms in men include burning and pain while urinating, increased urinary frequency, discharge from penis (white, green, or yellow in colour), red or swollen urethra, swollen or tender testicles, or sore throat. Symptoms in women may include vaginal discharge, burning or itching while urinating, painful sexual intercourse, severe pain in lower abdomen (if infection spreads to fallopian tubes), or fever (if infection spreads to fallopian tubes). Many women however do not show any symptom while in some others; symptoms might be so mild that they may go unnoticed (www.webmd.com/sexual-conditions/guide/gonorhea). There are some antibiotic resistant strains for gonorrhea but most can be cured with antibiotics.

SYPHILIS

Syphilis is caused by bacterium treponema palladium. It is passed from person to person during vaginal, anal, or oral sex and through direct contact with sores, called chancres. This is most commonly formed during the primary stage of syphilis which is about three weeks after infection. Sometimes, it may take up to 90 days. Syphilis occasionally can be passed to another person through prolonged kissing or close bodily contact. Pregnant women with the disease can spread it to their baby. It can cause abnormalities or even death to the child (www.webmd.com/sexual-conditions/guide/syphilis). Untreated syphilis can lead to complication and death. Clinical manifestations of syphilis include the ulceration of the uro-genital tract, mouth or rectum. If left untreated, the symptoms worsen. In recent years, the prevalence of syphilis has declined in Western Europe, but it has increased in Eastern Europe (former Soviet states). A high incidence of syphilis can be found in places such as Cameroon, Cambodia, and Papua New Guinea. Syphilis infections are increasing in the United States (Clement et al, 2014).

URETHRITIS

Urethritis is inflammation of the urethra. Urethra is the tube that carries urine from the bladder to outside the body. It is commonly due to infection by bacteria that enter the urethra from the skin around the urethra's opening. Bacteria that commonly cause urethritis include E. coli and other bacteria present in stool, Gonococcus which is sexually transmitted and also cause gonorrhea and Chlamydia trachomatis which is also sexually transmitted and causes Chlamydia. The herpes simplex virus (HSV-1 and HSV-2) can also cause urethritis. Trichomonas is another cause of urethritis. It is a single – celled organism that is sexually transmitted. Sexually transmitted infections like gonorrhea and Chlamydia are usually confined to the urethra but may extend into women's reproductive organs, causing pelvic inflammatory diseases (PID). This can lead to infertility in women. Pain with urination (dysuria) is the main symptom of urethritis. In addition to pain, other symptoms of urethritis include feeling the frequent or urgent need to urinate and difficulty starting urination. It can also cause itching, pain or discomfort when a person is not urinating. Other symptoms include pain during sex, discharge from the urethral opening or vagina and blood in the urine or semen in men (www.webmd.com/a-to-z-guides/urethritis-symptoms-causes-treatment)

HIV (Human Immunodeficiency Virus)

HIV is the virus that causes AIDS (Acquired Immunodeficiency Syndrome) body's immune system, which interferes with its ability to fight off disease – causing agents. The virus kills CD4 cell, which are white blood cells that help fight off various infections. HIV is carried in the body fluids, and is spread by sexual activities. It can also be spread by contact with infected blood, breast feeding, childbirth, and from mother to child during pregnancy. When HIV is at its most advanced stage, an individual is said to have AIDS (acquired immunodeficiency syndrome). There are different stages of the progression of the HIV infection. The stages include primary infection, asymptomatic infection, symptomatic infection, and AIDS. In the primary infection stage, an individual will have flu like symptoms (headache, fatigue, fever, muscle aches) for about 2 weeks. In the asymptomatic stage, symptoms usually disappear, and the patient can remain asymptomatic for years. When HIV progress to the symptomatic stage, the immune system is weakened, and has a low cell count of CD4+ T cells. When the HIV infection becomes life-threatening, it is called AIDS. People with AIDS fall prey to opportunistic infections and die as a result (King, 2009). When the disease was first discovered in 1980s, those who had AIDS were not likely to live longer than a few years. There are now antiretroviral drugs (ARVs) available to treat HIV infections. There is no known cure for HIV but the drugs help suppress the virus. By suppressing the amount of virus in the body, people can lead longer and healthier lives. Even though their virus levels may be low, the can still spread the virus to others.

DIAGNOSIS / TREATMENT OF STIs

In general, any person who is sexually active should discuss his or her risk factors for STIs with a health care provider and ask about getting tested. It is important for any sexually active person to remember that one may have STIs and not know it because many STIs do not cause symptoms. One should get tested

and have regular checkups with a health care provider who can assess and manage the risk, answer associated questions and diagnose and treat an STIs if needed. Some STIs may be diagnosed during a physical examination or through microscopic examination of a sore or fluid swabbed from the vagina, penis or anus. Blood test is used to detect infections such as hepatitis A, B and C or HIV/AIDS. Screening is especially important for pregnant women, because many STIs can be passed on to the fetus during pregnancy or delivery. Some of these STIs can be cured with drug treatments but not all of them. However, even if the infection is not curable, a pregnant woman for instance can usually take measures to protect her infant from infection (www.nichd.nih.gov/health/topics/stds/conditioninfo/pages/diagnosed.aspx)

PREVENTION / CONTROL OF STIS

There are several ways to avoid or reduce ones risk of sexually transmitted infections. Some of them include:

1. **Abstinence**. The most effective way to avoid STIs is to abstain from sex
2. **Stay with one unaffected person**. This is to stay in a long term mutually monogamous relationship with a partner who isn't infected
3. **Wait and verify**. Avoid vaginal and anal intercourse with new partners until you have both tested for STIs.
4. **Get vaccinated**. Getting vaccinated early before sexual exposure is also effective in preventing certain types of STIs. Vaccines are available to prevent HPV, hepatitis A and B. The Center for Disease Control (CDC) recommends the HPV vaccine for girls and boys ages 11 and 12. If not fully vaccinated at ages 11 and 12, the CDC recommends that girls and women through the age 26 and boys and men through age 26 receive the vaccine. The hepatitis B vaccine is usually given to newborns and the hepatitis A vaccine is recommended for 1 year olds.
5. **Use condoms and dental dams consistently and correctly.** Use a new latex condom or dental dam for each sex. Never use oil based lubricant such as petroleum jelly with a latex condom or dental dam.
6. **Don't drink alcohol excessively or use drugs.** If you are under the influence, you're likely to take sexual risk.
7. **Communicate**. Before any sexual contact, communicate with your partner about practicing safer sex. Reach an explicit agreement about what activities will and won't be okay.
8. **Teach your children.** Becoming sexually active at a young age tends to increase a person's number of overall partners and as a result, his or her risk of STIs. Biologically, young girls are more susceptible to infection. While you can't control your teen or preteen's actions, you can help your child to understand the risks of sexual activity and that it's okay to wait to have sex.
9. **Consider male circumcision.** There's evidence that male circumcision can help reduce a man's risk of acquiring HIV from an infected woman (heterosexual transmission) by as much as 60%. Male circumcision may also help to prevent transmission of genital herpes.
10. **Consider the drug Truvada.** This drug is used to reduce the risk of sexually transmitted HIV infection in those who are at high risk. It is also used as an HIV treatment along with other medications (www.mayoclinic.org/diseases-conditions/sexually-transmitted-diseases-stds/basic/prevention/con-20034128)
11. **Public awareness campaign.** This is an effective means of controlling the spread of STIs apart from the aforementioned preventive measures. The government and non – governmental bodies should sponsor campaign programs aimed at educating the public of the preventive measures and the need to always go for test for diagnosis from time to time. The public awareness enlightening campaign can be achieved using the following means:
    i. Radio / television advertisement enlightening program
    ii. Print media (newspapers / Magazine) advertisement enlightenment program
    iii. Social media advertisement enlightenment program
    iv. The use of bill boards
    v. the use of community / town criers and
    vi the use of religious bodies / worship centers

    The public awareness enlightenment campaign can also be achieved by encouraging and sponsoring academicians to write, present and publish materials that are related to sexually

transmitted diseases. A lot must be done by individuals, corporate bodies and the government for these measures to actualized.

WARNING

Starting treatment quickly is important to prevent transmission of infections to other people and to minimize the long - term complications of STIs. Recent sexual partners should also be tested and treated to prevent re-infection and further transmission.

METHOD OF ANALYSIS

The statistical technique to be used in this study is the Chi - square test of independency to test that the incidence of sexually transmitted diseases is independent of gender of individuals.

Chi – Square (χ^2) Test

Chi-square test is used in testing the degree of independency, discrepancy or association between two characteristics of interest. The test statistic is given by:

$$\chi^2_{cal} = \sum_{i=1}^{r} \sum_{j=1}^{c} \frac{(Oij - Eij)^2}{Eij}$$

Where:
O_{ij} is the observed frequency in the ith row and jth column, E_{ij} is the expected frequency in the ith row and jth column, where $E_{ij} = (T_{ir} \times T_{jc}) / T_g$. $\mathbf{T_{ir}}$ is the ith row total, $\mathbf{T_{jc}}$ is the jth column total and $\mathbf{T_g}$ is the grand total.

HYPOTHESIS OF INTEREST

The statement of hypothesis of interest is:
H_0: Incidence of Sexually transmitted diseases is independent on the gender of individuals vs
H_1: Incidence of Sexually transmitted diseases is dependent on the gender of individuals.

Decision Rule:
H_0 is rejected if $\chi^2_{cal} > \chi^2_{tab}$ where $\chi^2_{tab} = \chi^2_{(r-1)(c-1)}(\alpha)$, where α is the level of significance. H_0 is accepted if otherwise.

SOURCE / DATA PRESENTATION

The Federal Medical Centre, Lokoja (FMC) is the case study for this work and the data was collected for the years 2005 – 2014. Although there are so many types of sexually transmitted infections (STIs), this study chooses to work on gonorrhea, syphilis, urethritis and AIDS test whether the incidence of the diseases is independent on the gender.

Table 1. Reported cases of the selected STIs by gender (observed values)

Diseases	Male	Female	Total
Gonorrhea	1813	1816	3629
Urethritis	3151	3063	6214
HIV/AIDS	6578	6310	12888
Syphilis	349	414	763
Total	11891	11603	23494

ANALYSIS

From the data presented in Table 1, and given that $E_{ij} = (T_{ir} \times T_{jc}) / T_g$, we have:

Table 2 Expected values of the reported cases of the selected STIs by gender

Diseases	Male	Female	Row total
Gonorrhea	1836.743	1792.257	3629
Urethritis	3145.087	3068.913	6214
HIV/AIDS	6522.993	6365.007	12888
Syphilis	386.177	376.823	763
Column total	11891	11603	23494

From tables 1 & 2 and using:

$$\chi^2_{cal} = \sum_{i=1}^{r} \sum_{j=1}^{c} \frac{(Oij - Eij)^2}{Eij}$$, we have:

Table 3. Procedural Analysis

$O_{ii} - E_{ii}$	-23.743	5.913	55.007	-37.177	23.743	-5.913	-55.007	37.177
$(O_{ii} - E_{ii})^2$	563.730	34.964	3025.770	1382.129	563.730	34.964	3025.770	1382.129
$(O_{ij} - E_{ij})^2 / E_{ii}$	0.307	0.011	0.464	3.579	0.315	0.011	0.475	3.669

So that we $\chi^2_{cal} = 8.831$

CRITICAL VALUE
From the table, $\chi^2_{tab} = \chi^2_{(4-1)(2-1),\ 0.05} = \chi^2_{(3),\ 0.05} = 7.819$

DECISION RULE:
Since $\chi^2_{cal} = 8.831 > \chi^2_{tab} = 7.819$, we reject H_0

CONCLUSION: Since $\chi^2_{cal} = 8.831 > \chi^2_{tab} = 7.819$, we reject H_0 and thus conclude that the incidence of sexually transmitted infections (STIs) is dependent on the gender of individuals.

FINDINGS

From the result of the analysis, $\chi^2_{cal} = 8.831 > \chi^2_{tab} = 7.819$. We thus reject the hypothesis under consideration (H_0) and conclude that the incidence of sexually transmitted diseases (STIs) is dependent on the gender of individuals. That is, the reported case of the incidence or occurrence of the disease to an extent depends on gender.

CONCLUSION

The study reviewed the concept of sexually transmitted infections (STIs), types, symptoms, causes, diagnosis/treatment and preventive/control measures. Also, a test was carried out to test whether the incidence of the occurrence of sexually transmitted infections (STIs) is irrespective of gender. From the result of the analysis, it was concluded that the incidence of the occurrence of sexually transmitted diseases (STIs) is in respect of gender of individuals. That is the reported cases of the incidence of the occurrence of the disease to an extent depend on gender.

RECOMMENDATIONS

i. Since up till date there are no generally accepted cure for HIV/AIDS in particular, researchers need to intensify more efforts to have a breakthrough in finding a cure for the dreaded STI.
ii. The Government should as a matter of urgency establish more hospitals and health care centers to cater for the ever increasing STI victims and put in place necessary measures to curb the spread of the infections
iii. Public enlightenment programs that can help in reducing the spread of STIs should be intensified by both Governmental and non – Governmental bodies as well as individuals iv. Health education should be made compulsory as part of the curriculum of all the senior classes of primary schools and all levels of post primary institutions. This will help in educating the pupils concerned and students of some of the preventive measures of STIs. Parental - child education should also be encouraged for charity begins at home.

REFERENCES

Clement M.E; Okeke N. L; Hicks C. B. (2014) "Treatment of syphilis". JAMA 312 (18): 1905. doi:10.1001/jama.2014.13259. ISSN 0098-7484

Hoffmann B. (2012). Williams gynecology, New York: Mcgraw-Hill Medical. ISBN 9780071716727

King B. (2009). Human sexuality Today (sixth ed.). Upper saddle River: Pearson Education, Inc.

Nancy M. and Kapil G. (2012): Sexually transmitted diseases: An overview. Department of Parasitology, Postgraduate Institute of Medical Education and Research, Chandigarh India.

World Health Organization (WHO): Sexually Transmitted Diseases. First Published Jan – Aug 2010. P.O box 39001. Vol. 7. Printing Company, Lagos

www.islamset.net/hip/anvir_adam.html- Health An Islamic Perspective – Sexually Transmitted Diseases And Islam).

https://en.m.wikipedia.org/wiki/sexually_transmitted_infection.

www.plannedparenthood.org/learn/stds-hiv-safer-sex

www.webmd.com/sexual-conditions/guide/syphilis

www.webmd.com/sexual-conditions/guide/gonorhea

www.webmd.com/a-to-z-guides/urethritis-symptoms-causes-treatment

www.nichd.nih.gov/health/topics/stds/conditioninfo/pages/diagnosed.aspx

www.mayoclinic.org/diseases-conditions/sexually-transmitted-diseases-stds/basic/prevention/con-20034128

www.healthline.com/health/sexually transmitted diseases.