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Prevalence of Trichomonas vaginalis Among Married and Single Sexually Active Females in Oguta LGA, Imo State, Nigeria

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Abstract
Trichomonas vaginalis is one of the most common non-viral sexually transmitted infections globally. It is mostly attributed in females by a frothy-greenish yellow foul odour vagina discharge accompanied with vulva vaginal irritation, dyrusia and lower abdominal pains. Trichomonas is linked to increased mortality as well as a predisposing factor to HIV infections and cervical cancers. This study was conducted to determine the prevalence of Trichomonas vaginalis. infection among females in Ohaji Egbema, Ogut, Local Government Area. Imo State, Nigeria. Using vaginal swaps and urine samples, a total of 104 females between the ages of (14-43) years were examined. An overall prevalence of females within the age bracket of (24-28) years recorded the highest number of infections while no infections were recorded among the females between the age bracket of (14-18) years, the variation between singles and married was monitored and it was observed that married females had lower prevalence of this infection. There is a need for public health enlightening of adolescents, young female adults, including the elderly by religious organizations, relevant governmental and non-governmental agencies on sex education, public health implication of this infection and also the need to use protection or abstain from sex. Sexually active females should also be taught on how to practice monogamy.

Keywords: Prevalence, Infection, Trichomonas Vaginallis, Cervical Cancers, Females

Introduction

Trichomonas vaginalis is a flagellated protozoan parasite that thrives in anaerobic conditions and is responsible for causing trichomoniasis. It represents the most prevalent protozoan infection affecting humans in developed nations (Soper, 2004). Although the rate of infection is comparable between men and women, women commonly exhibit noticeable symptoms, whereas infections in men tend to remain without clinical signs. Transmission occurs primarily through direct physical contact with an infected partner during sexual activity. According to the World Health Organization (2019), approximately 160 million new cases of *T. vaginalis* infection occur globally each year. In North America alone, it is estimated that between five and eight million new infections arise annually, with up to half of these cases being asymptomatic. The standard treatment regimen for trichomoniasis involves the administration of metronidazole or tinidazole.

In women, trichomoniasis presents with a wide range of symptoms — from intense inflammation and irritation accompanied by a frothy, foul-smelling discharge to cases where the infected person shows little or no symptoms at all. However, the most common clinical signs include vaginitis, urethritis, and occasionally prostatitis. The variation in how the disease manifests may result from genetic differences among *T. vaginalis* strains and the individual's immune response. The vagina is the primary site of infection in females, while in males, the urethra is most frequently

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affected. Transmission occurs mainly through sexual contact, including vaginal-penile and vaginal-vaginal intercourse, as well as other intimate contact such as anal sex, oral sex, or genital touching with an infected person. Women can contract the infection from either men or women, but men typically acquire it only from infected women. Women infected with *Trichomonas vaginalis* during pregnancy are at risk of delivering low birth weight babies (less than 5.5 pounds) and may experience premature rupture of membranes or preterm labor. Despite these serious implications, the prevention of trichomoniasis has not received much attention, largely because it has long been underestimated as a minor sexually transmitted disease (STD) and due to limited public health resources. Moreover, similar to other sexually transmitted infections, *T. vaginalis* infection can increase susceptibility to HIV transmission (Moodley et al., 2002). Laboratory diagnosis is typically made by isolating the parasite from vaginal, urethral, or prostatic secretions.

Trichomonas vaginalis can be isolated in vaginal, prostatic or urethral secretions, semen and urine of infected individuals. The most commonly employed diagnostic methods are direct microscopic examinations of wet mount preparations (with a sensitivity of 38% - 82%), and culture techniques. Combination of both wet mount examination and culture has been recommended as being more effective in establishing diagnosis than either one alone. Direct Research has shown that combining examination and culture provides a more reliable diagnosis of *Trichomonas vaginalis* infection than using either method separately. The direct microscopic examination of a wet mount from clinical samples remains the quickest and most affordable approach for detecting *T. vaginalis*, making it the most widely applied diagnostic method. However, this technique has been found to have low sensitivity, especially in diagnosing infections in men. Other diagnostic approaches that have been developed include antigen detection assays, the plastic envelope technique, the InPouch system, cell culture, various staining procedures, as well as serological and DNA-based methods.

One reason trichornoniasis spreads so easily is that a large number of infected people (up to 70%) never show symptoms. One may infect others before knowing they have the disease. An individual infected with *Trichomonas vaginalis* may present with various symptoms such as a thin or sometimes frothy vaginal discharge that may be white, yellow, or greenish with an unpleasant odour, genital itching or irritation, and a burning or painful sensation during urination. In men, the infection may cause a whitish discharge from the penis, a burning feeling after ejaculation, and discomfort during sexual intercourse.The parasite *Trichomonas vaginalis* inhabits the lower genital tract of females and the urethra and prostate of males, where it multiplies through binary fission. It does not form cysts and cannot survive long outside the host's body. Humans serve as the only known host, and transmission occurs mainly through sexual contact, especially vaginal intercourse.

Historically, detection of the parasite is made possible by examination of urine and High Vaginal Swab (HVS) in a drop of saline or Trichomonas diluents for the characteristic wobbling and rotating motion. Amadi and Nwagbo (2013) reported that Previous studies have indicated that the use of either a urine sample or a vaginal swab alone is insufficient for the accurate diagnosis of *Trichomonas vaginalis* infection. Improved diagnostic accuracy has been achieved when both urine and vaginal swab specimens are utilized concurrently. Traditionally, the laboratory diagnosis of trichomoniasis has relied primarily on wet mount microscopy and parasite staining, with reported success rates ranging from 20% to 80% (Fouls et al., 1980). However, the combination of cultural methods with microscopic wet mount examination is now regarded as the most effective diagnostic approach (Arora et al., 2005). In recent years, the increasing recognition of trichomoniasis as a prevalent sexually transmitted infection has led to the development of molecular diagnostic techniques with enhanced sensitivity. The introduction of rapid antigen detection assays and nucleic acid amplification tests has significantly improved the precision and reliability of *T. vaginalis* detection, particularly among female patients (Hobbs et al., 2013).

Methodology

Materials used

- Centrifuge
- Cover slip
- Slide
- Swab stick

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- Urine bottle
- Microscope
- Saline
- Centrifuge tube
- Hand stoves and Nose mask

Study area

Ohaji Egbema is located in Imo State, South East Geopolitical Zone of Nigeria. It is headquartered in Mmahu Egbema, it comprises three political districts. Ohaji East, Egbema North, and Ohaji West and has seventeen autonomous communities. The study area is bounded by Latitude 5.4024 and Longitude 6.8245, 5.24' 9" N/6^{0}49'28"E
Ohaji Egbema Geography;
Latitude:5.30583, Longitude 6.94556, 5.18'21"North,6.56'44" East with over 89,000 hectares of land. It is bounded to the East by Owerri, to the North Oputa LGA.

Ethical clearance

Before collection of samples, the consent of the respondents was obtained after being updated on the reasons for collection of samples and importance of the study.

Sample Size

A total of 104 consented married and singles sexually-active females were examined in Ohaji Egbema, the age range was 14^{+} and above **Sample collection**
Urine samples were collected with sterile universal bottles, while sterile swab sticks were given to them to collect their vaginal swab from the upper part of the vaginal, both samples were examined in order to get a more précised result.

Laboratory analysis

The Swab samples were analyzed using the wet prep method. Saline was added to the swab stick containing the sample and left to stand for 5 minutes for the organism to be more visible. A smear was made on a clean glass slide and covered with a covered slip, this was viewed under the microscope with a magnification of x40 and xlOO.
The urine samples were centrifuged at a revolution of 4,000rpm. The supernatants were decanted and the sediments were placed on the glass slides, covered with cover slips. These were viewed under the microscope for detection of any motile organism which was identified morphologically.

Statistical Analysis

The data obtained were analyzed using the Chi-square test at a 0.05 level of significance.

Results

A total of 104 consented females were examined for Trichomonas vaginal. In Ohaji community (80 single sexually-active and 24 married females). Out of the 104 females examined, 14 were infected with an overall prevalence of 13.5%, The highest prevalence of 64.3% was recorded among singles as shown in table I. The married females had 35.7 % prevalence of infection. The positive results were from vagina swab samples collected, Urine samples showed no Trichomoniasis infection, rather Candida albican infections which is outside the scope of this work. The difference in prevalence between the married and the single sexually-active female is statistically insignificant. (P>0.05).

Table 1: in Ohaji community

RESPONSE	POSITIVE (+VE)	NEGATIVE (-VE)	TOTAL NO OF FEMALES EXAMINED
MARRIED	5 (35.7%)	19 (27.1%)	24 (23.1%)
SINGLES	9 (64.3%)	71 (78.9%)	80 (76.9%)
TOTAL	14 (100%)	90 (100%)	104 (100%)

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Table 1 shows the prevalence of T. vaginalis among married and single sexually active females in Ohaji, In which single sexually active females showed a higher prevalence of (64.3%).

Table 2: Table 2: Distribution of *T. vaginalis* Infection by Age Group Showing the Highest Prevalence (36%) Among Ages 24–28

AGE RANGE	NO OF FEMALES SAMPLED (%)	NO OF INFECTED FEMALES (%)
14-18	11 (10.6)	0
19-23	63 (61.0)	3 (21.4)
24-28	21 (20.1)	5 (36.0)
29-33	3 (2.90)	3 (21.4)
34-38	4 (15.3)	2 (14.2)
39-42	2 (1.92)	1 (7.10)
TOTAL	104	14 (100)

Table 2: Shows the prevalence of T. vaginalis related to age. The result showed a higher prevalence (36%) of *T.* vaginalis among age group 24-28. Is statistically Significant (P<0.05)

Table 3 Results for other STDS

AGE RANGE	NO OF FEMALES SAMPLED	NO OF INFECTED FEMALES
14-18	11	9
19-23	63	28
24-28	21	14
29-33	3	6
34-38	4	6
39-43	2	4
TOTAL	104	67

Table 3 shows result for other STDS discovered.
Candida albican was also discovered in this research, females within the age group of 19-23 recorded the highest positivity while 39-43 recorded the lowest.

Discussion

The findings of this study indicate an overall prevalence rate of 13.5%, with a heterogeneous distribution of infection across different age groups (Kissinger et al., 2015; Menezes et al., 2016). The highest infection rate was observed among females aged 24–28 years, representing the most affected segment of the study population. However, this observation differs from earlier reports, which identified women aged 31–45 years as being at greater risk of Trichomonas vaginalis infection (Mahmoud et al., 2015; Sutton et al., 2004). Furthermore, the infection frequency among women within the 24–28-year age range in this study was lower than rates documented in other African settings, such as in Zimbabwe (Gregson et al., 2001). And United states of America (Roth et al., 2011) this variation can be due to variability in terms of disease exposure as well as use of different diagnostic methods across the studies (Azambakhtiar et al., 2018; Arbabi el al., 2014). This age group had been implicated to be a sexually active and reproductive age group, which is a predisposing factor of the infection. The highest prevalence of 64.3% was recorded

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among single females. Researches had revealed that divorced women and single women or sexually-active females are more likely to develop Trichomoniasis as compared to people who abstain from sex or people who are married (Grama et al., 2013; Madhivanan et al., 2004). Thus, strategies aiming at improving the disease awareness in this high-risk group are needed to further improve trichomoniasis infection. However, without additional information on participants and respondents, educational level, or knowledge about sexually transmitted infection, it was not possible to determine their relationship with trichomoniasis prevalence.

In the present study, the detection of *Trichomonas vaginalis* relied solely on wet mount smear and microscopic examination, which are part of standard routine diagnostic practices. No supplementary diagnostic procedures, such as culture or polymerase chain reaction (PCR), were performed. This limitation may have contributed to a reduced detection rate of the parasite. It is well-documented that employing at least two diagnostic methods enhances the accuracy of *T. vaginalis* identification—for instance, combining culture with wet mount microscopy (Arbabi et al., 2014). Nevertheless, culture techniques are often prone to bacterial contamination, which can interfere with the growth of *T. vaginalis* (Nye et al., 2009; WHO, 2012; Cotch et al., 1991). Notably, this study recorded a higher preva3lence of *T. vaginalis* infection among females aged 24–28 years.

Conclusion

Trichomoniasis is not a common sexually transmitted disease (STD) among females in Ohaji community, Oguta Local Government Area, Imo state, Nigeria. This result of this study revealed an overall prevalence of 13.5%. The frequency of Trichomonas vaginalis infection in this study among this age group 24-28 years happens to be lower than what was reported in other countries. There is still a need for public health enlightening of adolescents, young female adults, including the elderly by religious organizations, relevant governmental and non-governmental organizations should intensify efforts on sex education to raise awareness about the public health impact of this infection. Emphasis should be placed on the importance of using protective measures or practicing abstinence. In addition, sexually active females should be educated on the benefits of maintaining monogamous relationships to reduce the risk of infection.

Recommendations

- Females who observe changes in vaginal discharge and symptoms of infections are advised to see a doctor immediately.
- Self-medication should be discouraged among individuals who have been tested positive.
- Use of wet towels, wet underwear should be discouraged.
- Females should avoid douching.

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