

Incidence of *Trichomonas vaginalis* among Internally Displaced Women in Ibaka, Akwa Ibom State, Nigeria

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Abstract

A total of 282 outpatient pregnant antenatal and non-pregnant women from internally displaced camps attending the Poly Health Clinic (PHC) and the Enwang Health Centre (EHC) were examined for *Trichomonas vaginalis* infection. Direct wet mount microscopy and Giemsa staining techniques were used on High Vaginal Swab (HVS) specimens collected on sterile swab sticks. A prevalence of 20 (57.1%) was recorded using both methods; 12 (7.2%) in PHC and 08 (6.2%) in EHC Mbo local government area, Akwa Ibom State respectively. Differences among pregnant and non-pregnant women used were statistically significant ($P < 0.05$). Women in the age group 15 - 19 years had the highest prevalence of infection 03 (10.5%), closely followed by those of age group 20 - 24 years 6 (6.8%). A total number of 14 (6.7%) infections were recorded among married women followed by single women with 06 (10%). A higher prevalence rate of 01 (24%) was recorded among women who attended Quranic level of education and 04 (16.7%) with uneducated women, this may be due to small sample size within this group of women. 12 (6.5%) in women with primary school education and 03 (4.7%) in women with secondary school level of education. The need for improved personal hygiene in IDP camps and other effective intervention programmes among these vulnerable groups of women is advocated.

Keywords

Trichomonas vaginalis, IDPs, Ibaka

1. Introduction

Trichomonas vaginalis is an anaerobic, flagellated protozoan parasite and the

causative agent of Trichomoniasis. It is the most common pathogenic protozoan infection of humans in developing countries [1]. Infection rates between men and women are similar, with women being symptomatic, while infections in men are usually asymptomatic. Transmission usually occurs via direct, skin-to-skin contact with an infected individual, most often through vaginal intercourse. The WHO has estimated that 160 million cases of infection are acquired annually worldwide [2]. The estimates for North America alone are between 5 and 8 million new infections each year, with an estimated rate of asymptomatic cases as high as 50% [3].

Most cases of *T. vaginalis* remain undiagnosed as it is currently not a target of sexually transmitted infections control and besides because of its asymptomatic nature in about half of infected men and women [4]. The disease is reported as a major cause of pathology in obstetrics and gynecology [5]. It has also been reported that the disease causes discomfort and psychosocial distress in infected patients [1]. Complications of *T. vaginalis* that have been reported among pregnant women and non-pregnant patients may include premature rupture of membranes, premature labour, low birth weight, post-abortion infections, pelvic inflammatory disease, urinary tract infection and bronchitis, pneumonia and oral lesions, and infertility [6]. Although the disease has been seen as a risk factor for other sexually transmitted agents such as *Chlamydia trachomatis* and *Neisseria gonorrhoeae*, it has also been linked to one of the predisposing factors to HIV infection, acquired immune deficiency syndrome, and cervical cancers [7].

Its symptoms are more commonly observed in women than in men. The symptoms in women may include frothy-greenish foul-smelling vaginal discharge accompanied with vulvovaginal irritation, post coital bleeding, frequency in micturition, dysuria, and lower abdominal pains [8]; preterm rupture of membranes, preterm delivery, low birth weight infants, and neonatal morbidity and mortality are symptoms associated with pregnancy [9]. Factors such as poor personal hygiene, multiple sexual partners, low socioeconomic status, and under development have been reported to be associated with high incidence of infection [10].

In Nigeria, there has been increasing prevalence of trichomoniasis in many states of the federation [11] [12], and based on the public health importance of *T. vaginalis* infection, The current study aimed to determine the prevalence of trichomoniasis and its associated epidemiological factors among women in internally displaced and Ibaka seaport settlements in Akwa Ibom State. Usually treatment consists of metronidazole and tinidazole [13].

2. Aim and Objectives

To determine the prevalence rates of *Trichomonas vaginalis* among women in IDP camps in Ibaka, Akwa Ibom State.

To determine the occurrence of *Trichomonas vaginalis* using socio-demographic

characteristics among the participants in the IDP camps. In Ibaka Communities.

3. Materials and Methods

3.1. Study Area

This study was carried out at the Ibaka seaport settlement in Mbo Local Government Area, Akwa Ibom State, Nigeria. The Poly Health centre used is a Government health institution saddled with the responsibility of providing health-care services for the inhabitants of Ibaka and neighboring seaport settlements.

3.2. Study Population

A total of 282 patients and subjects were recruited for this study. The study population consisted of 200 pregnant women attending antenatal clinics and 100 non-pregnant apparently healthy subjects served as controls. The age ranged from 15 to 40 years. Informed consent was sought from the participants before specimen collection. Serial sampling was employed, and the patients who did not return their consent form were excluded from the study. The protocol for this study was approved by the Ethics and Research Committee of the Ministry of Health, Akwa Ibom State. A structured questionnaire was administered to obtain demographic characteristics (such as age, marital status, level of education and occupation) from each participant.

3.3. Data Analysis

Statistical analysis of the results was conducted using Chi-square at 0.05% with an appropriate degree of freedom. A P-value of a level less than 0.05 ($P \leq 0.05$) was considered statistically significant.

3.4. Specimen Collection and Processing

High vaginal swab was collected from each participant using a sterile swab stick. Briefly, exudate from the vagina was collected using a sterile swab stick aided with sterile speculum. To the exudate collected, a drop of normal saline was added and mixed. A drop of the emulsified vaginal exudate was placed on a grease-free slide and a coverslip mounted. The preparation was immediately examined microscopically using $\times 10$ and $\times 40$ objective lenses. Using its characteristic morphology and darting motility, *T. vaginalis* was identified.

3.5. Identification of *T. vaginalis*

Wet mounts of all swab samples were made in sterile normal saline on clean slides, covered with a cover slide and examined under the low power (10 \times) and high power (40 \times) magnifications for presence of motile trichomonads. Pear-shaped, motile flagellates were seen moving with characteristic jerky, wobbling and rotating motions.

A smear of the secretion was also made on a slide, air-dried and fixed in absolute methanol for one minute. Diluted Giemsa stain was poured on the smear

and allowed to stain for 10 minutes after which it was washed, air dried and examined under microscope with oil immersion ($\times 100$) magnification for presence of trichomonads.

4. Discussion

The result of this study has demonstrated the prevalence and incidence of *T. vaginalis* infection in pregnant and non-pregnant women in Mbo, Akwa Ibom State. *T. vaginalis* was found in 13 (7.2%) of the pregnant women and 07 (6.9%) among non-pregnant women examined in this study (Table 1). The study shows the prevalence rate of 20 (7.1%) of both pregnant and non-pregnant women in the IDP camp (Table 2). This result partly agrees with findings from previous studies, for example 4.7% reported in Illorin, Nigeria [11]; 2.7% prevalence in Jos, Nigeria [10], 2.8% in Abakaliki, Nigeria [8] and 3.3% in Lagos, Nigeria [14].

However, this observation is at variance with a higher prevalence rate reported in a number of other studies; for example, 12.5% in Enugu, Nigeria [15], 15.0% in Benin City, Nigeria [16], 17.7% in Uyo, Nigeria [17], 18.7% in Zaria, Nigeria [18], 24.7% in Tanzania [19], 34.0% in Nairobi, Kenya [20] and 49.2% in South Africa [21]. There is a general consensus that the prevalence of *T. vaginalis* varied according to settings therefore, these disparities in prevalence could be attributed to the different environmental backgrounds and hygienic condition of the subjects studied.

Amongst the different age groups investigated, *T. vaginalis* infection distribution was highest in women aged 15 - 19 years (10.5%), followed by women aged 25 - 29 years (7.3%) and non in women aged 40 years and above (Table 3). The result of this study is in agreement with generally observed fact that the incidence of sexually transmitted diseases (STDs) including trichomoniasis, by the number of cases treated each year, is highest among the 15 - 30 years age group. These age groups reported by other researchers [12] are documented to be persons with the greatest sexual activity and that incidences decrease with age.

Table 1. Incidence of *T. vaginalis* among pregnant and non-pregnant internally displaced women from Ibaka settlements.

Subject	No. examined	No. positive	% positive
Pregnant	180	13	7.2
Non-Pregnant	102	7	6.9
Total	282	20	7.1

Table 2. Prevalence of trichomonas infection among internally displaced women from Ibaka settlements.

Health Facility	No. examined	No. infected	% Infected
Poly Clinic Ibaka	159	12	7.2
Enwang Health Centre	123	8	6.5
Total	282	20	7.1

Table 3. Age-specific distribution of infection among internally displaced pregnant and Non-pregnant women from Ibaka settlements.

Age (yrs)	No. tested	No. infected	% positive
15 - 19	38	3	10.5
20 - 24	88	6	6.8
25 - 29	110	9	7.3
30 - 34	24	1	4.2
35 - 39	20	1	5
40 - 44	2	0	0
Total	282	20	7.1

Women with pregnancy were observed to be more infected with *T. vaginalis* (7.2%), followed by non-pregnant women with (6.9%). Information retrieved from pregnant women revealed that the frequency of sexual intercourse during pregnancy decreases as number of children increases and this may likely be the reason for the low incidence of infection among advance marriages (Table 1). Our finding is consistent with previous report in Imo state, Nigeria [11] who reported that young marriages had the highest prevalence of STDs.

However, this observation was in contrast with findings in Abakaliki, Nigeria who reported that advance marriages were more infected with *T. vaginalis* in their study. Marital status of pregnant women examined for *T. vaginalis* in this study was also found to be significantly associated with infection acquisition ($P < 0.05$). Single (unmarried) pregnant women were found to be more infected (10%) than the married (6.7%) (Table 4). This pre-supposes that unmarried women are unattached thus free to indulge in more sexual activities probably involving multiple sexual partners. This corroborates findings by Okpara *et al.* [10] who reported that single women were more infected in their study. In a related study a statistically significant association was found between trichomoniasis, prostitution, no condom use and other STDs [10].

Occurrence of *T. vaginalis* infection by level of education revealed that, illiterate women (16.7%) and (24%) women with Quranic education had the highest infection with *T. vaginalis* recorded in this study (Table 5), followed by women with the primary school leaving certificate categories with (6.5%) and secondary school certificate holders (4.7%). This was clearly due to the extremely small number of women in those groups examined as shown in Table 5. Thus, there was significant association between educational status and infection occurrence ($P > 0.05$), an observation that is in agreement with several studies [8] that have significantly linked educational status with infection occurrence.

The use of wet mount and Giemsa staining methods greatly enhanced the detection of *T. vaginalis* trophozoites that would have been missed by direct wet mount technique alone. Despite the limited sensitivity of these methods, direct wet microscopic examination of vaginal swab specimens alone remain the most

Table 4. Occurrence of infection by marital status of the pregnant and non-pregnant women in internally displaced camp from Ibaka.

Marital Status	No. tested	No. positive	% positive
Single	60	6	10
Married	210	14	6.7
Divorced/septed	8	0	0
Widow	4	0	0
Total	282	20	7.1

Table 5. Occurrence of infection according to the educational status of pregnant and non-pregnant women in IDP camp, Ibaka.

Education	No. Tested	No (%) Positive
None	24	04 (16.7)
Quranic	04	01 (24.0)
Primary	186	12 (6.50)
Secondary	64	03 (4.70)
Tertiary	04	00 (0.00)
Total	282	20 (7.10)

Key: No: Number.

widely utilized diagnostic test for the infection in most hospitals and this is reported to have a sensitivity of only about 60% - 80% [18]. According to some researchers [14], culture method is considered to be far superior to wet mount examination for the detection of the organisms and is currently the gold standard which should be considered for widespread clinical use.

The high incidence of *T. vaginalis* infection worldwide, co-infection with other sexually transmitted infections and attendant high risk of pelvic inflammatory diseases and tubal infertility make trichomoniasis a compelling public health concern [22].

Certain factors such as poor personal hygiene, multiple sex partners, and low socio-economic status with under development are also associated with high incidence of infection [23]. Neonatal trichomoniasis can be acquired during passage through an infected birth canal and it is estimated that 2% - 17% of female babies acquire trichomoniasis through direct vulvo-vaginal contamination. Trichomoniasis is an infection of multiple sites (e.g. vaginal epithelium, skene glands, bartholin glands and urethra), thus prompt diagnosis is important for eliminating infection in the patient and sexual partners and treatment of sexual partners is thought to increase cure rates [24].

5. Conclusion

Our study has confirmed the endemicity of *Trichomonas vaginalis* infection

among pregnant women in Ibaka, Mbo local government of Akwa Ibom State and suggests that the control of trichomoniasis can best be accomplished by public health programmes through persistent efforts to educate people on the need to improve on their personal hygiene, screen, diagnose, treat patients and sexual partners and follow up on the high risk individuals within communities.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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