Int J Biol Med Res. 2011; 2(4): 998 – 1002

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International Journal of Biological & Medical Research

Journal homepage: www.biomedscidirect.com

Original article

Prevalence of trichomonas vaginalis infections among antenatal clients in Maiduguri Nigeria

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ARTICLE INFO

Keywords:
Prevalence
Trichomonas vaginalis
Infections
Pregnancy
Antenatal clients

ABSTRACT

Background: The pregnant women infected with Trichomonas vaginalis may be at risk of adverse birth outcomes such as premature rapture of membranes, premature labour, low birth weight, post – abortion or post-hysterectomy infections, as well as neonatal infections. Objectives: To determine the prevalence of trichomoniasis among pregnant women attending antenatal clinic in Maiduguri Metropolis, Northeastern Nigeria. Settings: Three health facilities in Maiduguri Metropolis were used; Yerwa Maternal and Child Health Care Center (Yerwa), State Specialist Hospital Maiduguri (SSHM) and University of Maiduguri Teaching Hospital (UMTH). Methodology: The study was a cross sectional survey of nine hundred and nineteen pregnant women aged between 15-44 years. Vaginal swab was collected from each of the subjects, The Samples were analysed within one hour of collection. Vaginal swab specimens were also cultivated in prepared OXOID Trichomonas medium and examined for motile Trichomonads. Results: Of the total 919 pregnant women studied 101 (10.99%) were found to have Trichomonas infection, with the highest prevalence at Yerwa Maternal and Child Health Center; age group between 15 and 26 years were most (46.5%) affected; there were no significant differences between the second and the third trimesters infections. The infection was more (19.6%) prevalent among those with primary education, while 43% of business women and students were infected. Conclusion: The prevalence of Trichomonas vaginalis infection of 11% in our community is a public health risk, therefore, clinicians should routinely screen all pregnant women for the infection and appropriate treatment be given early, emphasis must be placed on the youths, those with low educational background and the business women.

1. Introduction

Trichomonas vaginalis, an anaerobic, parasitic, flagellated protozoon, is the causative agent of trichomoniasis and is the most prevalent non viral sexually transmitted infection worldwide, [1] with an estimated 180 million infection acquired annually worldwide.[2] Humans are the only known host with the trophozoite transmitted principally via vaginal sexual intercourse, and rarely via fomites .[3]

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In women the disease encompasses broad range of symptoms ranging from a severe inflammation and irritation with frothy malodorous discharge to a relatively asymptomatic carrier state. [4] But the main clinical manifestation of trichomoniasis is vaginitis, urethritis and prostatitis. The outcome of infection with Trichomonas may be due to genetic variability of the isolates and the host immune response. [5]

The pregnant women infected with this parasite may be at risk of an adverse birth out comes such as premature rapture of membranes, premature labour, low birth weight, and post – abortion or post-hysterectomy infection, as well as infertility and enhanced predisposition to neoplastic transformation in cervical tissues. [6] As with other sexually transmitted infections, the Trichomonas infection can increase the risk of transmission of HIV infection. [7, 8]

Transmission of Trichomonas Vaginalis to neonates during passage through an infected birth canal is also possible. [6, 9,] In the foetus and the neonates, complications such as abnormalities of the major organ systems as well as infections in form of pneumonia and conjunctivitis may also occur. [10] Neonatal infection is infrequently reported, but has been noted to cause urinary tract infection and vaginitis in infants. [11] In addition, infants with Trichomonas vaginalis cultured from nasopharyngeal secretions have been reported to present with significant respiratory distress. [12]

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 examination of wet mount preparation of clinical specimen is the most rapid and least expensive technique for identifying Trichomonas vaginalis, hence the most commonly used. This method has however been reported insensitive for the diagnosis of the disease, particularly in male patients. [9] Other methods include antigen detection methods, plastic envelope method, in-pouch system, cell culture, staining techniques, serological and DNA techniques.

In Nigeria, there are some documented reports on the prevalence of Trichomonas infections among women, [13, 14, 15] students, [16, 17] Commercial sex workers [18] and in pregnant women, [6, 9, 19] but no similar study on pregnant women has been done in our region (northeastern Nigeria) and possibly only one [9] in the northern part of Nigeria.

Therefore, this study was conducted to determine the prevalence of Trichomonas infection among pregnant women attending antenatal clinic in Maiduguri Metropolis, Northeastern Nigeria.

2. Materials and Method

2.1.Study Area

This study was conducted in Maiduguri, the capital of Borno State. Borno State is located in the north-eastern corner of Nigeria. The state occupies a greater part of the Chad Basin Area, and it shares borders with three African countries namely, Niger Republic to the north, Republic of Chad to the north east and Cameroon Republic to the East. Within the Nigerian nation, it shares borders with Yobe, Adamawa and Gombe states to the north-west and south respectively.

The state covers an area of 69.436 square kilometres and the population of the state (according to the 2006 National population census) was 4 151 193 - (64.37% rural populace - 35.63% urban populace). [20] Islam is the major religion followed by Christianity. The principal tribes of Borno are Kanuri, Babur, Bura, Margi, Shuwa Arab, Fulani and Hausa. The state is rich with various cultures, norms and values, and the popular occupations of Borno citizenry are farming, fishing and trading.

Available statistics show that the reproductive health situations in this area are the worst compared to any part of Nigeria. The crude birth rate was 43.60 per 1 000, gross fertility rate 183 per 1 000 and maternal mortality ratio of 1 549 per 100 000 live births. Only 2% of women in this region were said to be using modern contraceptives. [21] The HIV/AIDS prevalence has been fluctuating from 4.5% to 5.4%; the current 2003 sentinel survey amongst women attending ante-natal clinics indicated the prevalence at 3.2%. However, this prevalence rate of 3.2% is not realistic as hot spot areas like border towns [22] (e.g. Baga, Ngala and Askira-Uba) were not included in the survey.

2.2.Study Population/Sampling Techniques

The study was a cross sectional survey of nine hundred and nineteen pregnant women aged between 15-44 years (mean age of 26.16 ± 6.73 years) and of gestation age of 14-36 weeks who were attending routine antenatal clinic for the first time in three hospitals in the Maiduguri metropolis; a primary health care facility (Yerwa Maternal and Child Health Care Center, Yerwa), a secondary health care facility (State Specialist Hospital Maiduguri, SSHM) and a tertiary health facility (University of Maiduguri Teaching Hospital, UMTH). The study was conducted between 1st June 2010 and 31st December 2010.

Socio-demographic information and obstetric history were obtained from participants by use of structured questionnaire. Following informed consent and strict adherence to utmost confidentiality of treatment of all information obtained as specified in the ethical clearance guidelines given for this study, vaginal swab was collected from each of the subjects. Pretest counseling for STIs was given to each subject by a trained counselor before specimens were collected from them. The vaginal smears were obtained from the posterior fornix of the vagina using sterile swabs and the swab sticks were labeled accordingly. Personal identifier, initials of the clients only was used on the sample for the purpose of postnatal data. Sample collected were analyzed within one hour of collection. In case of delay, a drop of normal saline was added to the swabs stick container and stored in the refrigerator at 4 -8 OC and assayed within 1-3 hours. The patients that came back for results were given post test counseling and those infected were referred for treatment.

2.3.Cultivation of T. vaginalis

Vaginal swab specimens were cultivated in OXOID Trichomonas medium which was prepared by using 37.5g of the medium powder in 1000ml of distilled water. The medium was allowed to boil in water bath to dissolve well. It was adjusted to pH of 6 using dilute hydrochloric acid (HCL). It was then autoclaved at 121OC for 30 minutes. After cooling, 80mls of horse serum was added to the media 10mls of Oxoid penicillin-streptomycin was added to the medium to suppress bacterial growth. An aliquot of about 2mls media was then aseptically poured into sterilized Bijou bottles, which was then stored in the refrigerator at 4OC. The specimens were inoculated on the medium by cutting the tip of the swab sticks into the medium, which were also gently rotated. The inoculated medium in Bijou bottles were labeled and incubated at 37OC. Examination was made at intervals of 24, 48 and 72 hours.

2.4.Statistical Analysis

Proportions were compared using chi- square table of contingency. Statistical significance was achieved if P< 0.05.

2.5.Ethical Consideration

The Management of the three hospitals gave ethical clearance. Informed consent was sought and obtained from individuals.

3.Results

Of the total 919 pregnant women studied 101 (10.99%) were found to have Trichomonas infection, with the highest prevalence at Yerwa Maternal and Child Health Center; almost four times higher than the UMTH. Even though age group between 39 and 44 years were more affected but pregnant women between15 and 26 years are most affected; which constituted 46.5% of the total infected cases.

Table 1. Hospital Related Prevalence

Hospital	Number examined	Number positive	Percentage
UMTH	534	33	6.2
SSHM	298	45	15.1
Yerwa MCH	87	23	26.4
Total	919	101	11.0

Table 2. Socio-clinical factors and prevalence

	Number examined	Number positive	Percentage
Age			
15-20	134	25	18.7
21-26	139	22	15.2
27-32	403	33	8.2
33-38	223	17	7.6
39-44	19	4	21.1
>44	1	-	0
Gestational age			
2nd Trimester	603	64	10.6
3rd Trimester	316	37	11.7
Educational status			
Tertiary	321	17	5.3
Secondary	301	29	9.6
Primary	184	36	19.6
Islamiya	113	19	6.8
Occupation			
Civil Servant	212	20	9.4
Business	97	23	23.7
Student	109	21	19.3
Housewife	501	37	7.4

Nearly all the patients booked in their second and third trimester, and all our subjects for the study fell within the two trimesters, there were no significant difference between the second and the third trimesters. The infection was more (19.6%) prevalent among those with primary education, while 43% of business women and students were also infected.

4. Discussions

In Africa, it is estimated that 2-50% of the populations carry the infection. [23] The disease has important medical, social and economic implications. There is a higher prevalence of trichomoniasis among pregnant women than non-pregnant women. This might be due to the greater pelvic vascularity and oestrogenic activity on the vaginal epithelium which causes growth, maturation and exfoliation of the squamous cells and an increase in glycogen deposits in vaginal epithelial cells. [24] T. vaginalis is reported to be associated with the alkaline vaginal environment that occurs during pregnancy due to changes in the pH of the vaginal mucosa [24] Women who are infected during pregnancy are predisposed to preterm rupture of the placental membrane, preterm labour, delivery of low birth weight infants and increased infant mortality among others. [25, 26] and this study has found out that 10.99% of our antenatal clients were infected; with highest risk among ages 39 to 44 years, those with primary education, business women and Multigravida.

The prevalence rate of 10.99 found in this study is slightly lower than 12.3% found in Abakiliki, Southern Nigeria, [26] but much higher than other findings in Nigeria; 4.7% in Ilorin, [27] 5.2% in Calabar [19]and 2.8% in another study from South Eastern Nigeria.[6] Other researchers found much higher prevalence. These include 17.7% in Uyo Nigeria,[14] 18.66% in Zaria Nigeria,[9] 24.1% in Jos Nigeria,[28] 46.9% in New York,[29] and 36.1% in Nebraska.[30] These differences in prevalence could be explained on the basis of differences on social, cultural and environmental factors.

The prevalence was much higher at Yerwa Maternal and Child Health Center (26.4%); almost four times higher than the UMTH. Both Yerwa and SSH recorded above average prevalence of Trichomonas infections. This was possible, because, most of the clients at Yerwa Clinic and SSH were poor and less educated than those at the UMTH. In fact YMCHC is a primary health care center that services the native but poor communities of Maiduguri metropolis, and is patronized by thousands of women who could not afford service-charges at the secondary and tertiary health facilities. Certain factors, common among such communities, such as poor personal hygiene, multiple sex partners, low socio-economic status and under development are also associated with high incidence of infection. [31, 32]

Amongst the different age groups investigated, T.vaginalis infection prevalence was highest in women aged 39 – 44 years (21.1%). However, when we look at the youth (ages 15 – 26 years), there was higher prevalence of 33.9%. This study corroborate with, but less than, the findings in Zaria (16 – 25 years with 53.5% prevalence). The result also 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, [33]

In our study, pregnant women were significantly infected with Trichomonas in their 2nd and 3rd trimester in nearly equal prevalence. None of them were in their first trimester. Many studies showed that the prevalence is more in the first trimester, [17, 19] some indicated third trimester has more,[6, 14, 26] while some found more in 2nd trimester,[18, 23] yet a study conducted

in Port Moresby, Papua New Guinea[34] showed no association with gestational age. But our study point to the relevance of screening pregnant women during all the trimesters.

As regards to the educational level, those with primary education have the highest prevalence. The findings of previous studies in Maryland, USA [35] and in Ilorin Nigeria [27] that low level of education was associated with significant T. vaginalis infection among pregnant women is in agreement with this testimony. Therefore, there is the need for the provision of proper counseling and education on sexual behaviour and genital hygiene, besides treatment, to control and prevent trichomoniasis especially during pregnancy. The prevalence is low among those that attended Islamic Schools, possibly because of low sexual promiscuity among them, as sexual permissiveness has been incriminated as a risk factor. [36] Usanga et al in Calabar, also found no infection among this group. [19]

Nearly all the subjects classified as business women were traders and they were more (23.7%) infected with T. vaginalis, followed by students (19.3%). The high rate of infection observed among Business women in this work, is similar to previous studies. [6, 13] This prevalence may be connected to their active social living with little or no personal preventive measures. Sexual liberalism associated with wealth, poverty and ignorance, and lack of awareness of the public health repercussions may likely be the foremost in the list of risk factors. [13]

In conclusion, the prevalence of Trichomonas infection of 11% in our community is a public health risk, especially keeping in mind that HIV infection and other STIs can be enhanced with Trichomonas infection. Therefore, clinicians should routinely screen all pregnant women for the infection and appropriate treatment be given early to prevent the spread of STIs and possible implication on the newborn baby. Emphasis must be placed on the youths, those with low educational background and the business women. The policy makers need to enlighten the community on girl child education, safe sex and good hygiene, and to institute policies that will make health care services accessible, affordable and standard.

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