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RESEARCH ARTICLE

PREVALENCE Of *Trichomonas vaginalis* AMONG PREGNANT WOMEN IN ABAKALIKI, EBONYI STATE

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ABSTRACT

The study determined the prevalence of *Trichomonas vaginalis* among pregnant women attending antenatal clinics. A total of 1,025 single and married pregnant women within the age range of 15-40 years who had no known medical risk factors for preterm labor birth were enrolled from three hospitals of tertiary, secondary and primary levels. Vaginal smear samples were collected from the pregnant women with gestational age range of 14-36 weeks. Diagnosis of trichomoniasis was predicted based on the method of cultivation in cystein peptone liver maltose (CPLM) media. The prevalence of 12.3% (126 out of 1,025) was obtained. The results also showed that when age and marital status were compared with infection, no significant difference was observed ($P \geq 0.05$), but the infection was found to be dependent on literacy level, trimester and parity. Conclusively, trichomoniasis should be stressed during awareness campaign of other sexually transmitted infections (STIs), during ante-natal sessions as well as at secondary education level to educate the young girls.

INTRODUCTION

Trichomonas vaginalis, an anaerobic, parasitic, flagellated protozoa, is the causative agent of trichomoniasis and is the most common pathogenic protozoan infection of humans in the industrialized countries (Soper, 2004). The flagellate was originally considered a commensal organism until the 1950s when the understanding of its role as a sexually transmitted infection (STI) began to evolve (Anorlu *et al.*, 2001). Trichomoniasis constitutes the most widely prevalent non-viral sexually transmitted infection in the world with an

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estimated 180 million infection acquired annually worldwide (WHO, 1995). Humans are the only known host with the trophozoite transmitted via formites (Kingston *et al*., 2003). Both males and females are infected but the majority of cases were reported among females who also present with symptomatic infection than males (Kriegar, 2000). In females, vaginitis is the most common manifestation of the infection. Complications include the infection of the ednexa, skin, endometrium and Bartholin glands (Aboyeji and Nwabuisi., 2003). 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 (Uneke *et al*., 2006).

Although the organism appears to be highly prevalent, it has not been the focus of intense study nor of active control programs. This neglect is likely a function of the relatively mild nature of the disease (Uneke *et al*., 2006). This study as a result was designed to provide information on the prevalence of this organism and it's relationship with sociodemographic / epidemiological factors for the effective planning of control programs geared towards reducing the risks associated with it's infection among pregnant women in Ebonyi State.

MATERIALS AND METHOD

Study Area

The study was conducted at three Hospitals which include; Ebonyi State University Teaching Hospital (EBSUTH) Abakaliki, Abakaliki Local Government Area (L.G. A), EBSUTH Community Practice Centre Nwaezenyi (CPCN) Izzi L. G.A and Holy Child Hospital an Maternity (HCHM) Ekumenyi L.G.A, all in Ebonyi State, South–Eastern Nigeria. The period of the study was from November 2006 to August 2008. The study area is defined by longititude 8^0 6^I 6^{II} E and latitude 6^0 22^I 28^{II} N, elevated at 115.824 m above sea level and covers an area of approximately $51km^2$. The vegetation characteristics is that of the tropical rain forest with an average annual rainfall of about 1600mm and atmospheric temperature of 30 ^{0}C. It also reportedly bears a high burden of sexually transmitted infections (STIs) among men and women which was attributed to much ill social and sexual behaviour (Afoke et al., 2004; Uneke et al., 2006 a, b; Idioha et al., 2010). The inhabitants are mostly farmers, civil servants, traders, artisans, drivers, students etc. There are also resident professionals in the area of medicine and other fields of life.

Study Population/Sampling Techniques

The study was a cross sectional survey of one thousand and twenty five pregnant women aged between 15-40 years (mean age of 26.16 ± 6.73 years) and of gestation age of 14-36 weeks who present with or without complaint of vaginal discharge and were attending routine antenatal clinic at the out patient department of the hospitals. 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 vaginal using sterile swabs and the swab sticks were labeled accordingly. Personal identifier, name only was used on the sample for the purpose of postnatal data. Sample collected were analysed within one hour of collection. Incase of delay, a drop of normal saline was added to the swabs stick container and stored in the refrigerator at 4 -8 ^{O}C 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.

Cultivation of T. vaginalis

Vaginal swab specimens were cultivated in CPLM medium which was prepared by using 20g

Bactoliver powder, 960ml Ringers solutions, 2.4g Cystein monohydrochloride, 32g peptone, 1.6g maltose, 1.6g Bactoagar, 0.7ml (10.5%) Methylene bleu and 2.mls heat inactivated Horse serum, and 100 µg/ml penicillin G. The reagents were used to prepare the medium according to manufacturer's instruction. The specimens were inoculated on the medium by touching the swab sticks on it, which were also gently rotated. The inoculated CPLM medium in Bijou bottles were labeled and incubated at 37^{O}C. Examination was made at intervals of 24, 48 and 72 hours.

Statistical Analysis

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

RESULTS

Colour change of medium from deep green to pale green or straw colour indicated a positive result. Of the 1,025 pregnant women screened, 126 (12.3%) were positive for *T. vaginalis*. The prevalence was higher among those aged between 21- 25 years (Table 1). Among the trimesters considered, third trimester had the highest prevalence (18.1%) of the parasite whereas the first had the least (6.4%) (Table 2). Of the literacy levels evaluated, 70 out of 445 (15.7%) and 8 out of 116 (6.9%) non literate and those of tertiary level respectively were positive (Table 3). Also revealed were prevalences of 18.5% (56 of 303) and 9,7% (70 of 722) for primigravid and multigravid respectively (Table 4). In considering marital status, the highest prevalence of 13.6% was shown among the polygamous categories over others (Table 5). Analysis indicated statistical association between *T. vaginalis* and trimester, literacy level and parity ($P < 0.05$), but infection was independent of age and marital status ($P \geq 0.05$).

DISCUSSION

Trichomoniasis is of worldwide occurrence and shows diversity with respect to socio-cultural status of the communities changing from one country to another and from one society to another (Suleyman *et al*., 2002). Its infection in pregnant women predisposes them to high risk of adverse birth outcomes (Uneke *et al*., 2006). In this study, the overall prevalence of *T. vaginalis* was 12.3% (Tables 1-5). This is comparatively consistent with a number of previous records. Cotch *et al*., (1997), cultured vaginal smear of 13,816 pregnant women in Maryland, USA and observed prevalence of 12.6%. The prevalence of 15.3% and 15.37% reported by Osoba *et al.*, (1982) in Nigeria and Suleyman *et al*., (2002) in Izmir, Turkey respectively were somewhat above that reported in our study. The prevalence observed in this study appeared to suggest the existence of relatively high rate of this infection among pregnant women in Abakaliki, Ebonyi State which in effect indicates that the organism is still largely present in the population . It further suggests that trichomoniasis has neither been the focus of intense study nor active control programs probably due to the relatively mild nature of the disease.

Age related prevalence of *T.vaginalis* indicated the highest occurrence among women of 21 – 30 years old (Table 1), although no statistically significant difference was observed ($P \geq 0.05$). This is in agreement with most studies in Nigeria where age was found to be insignificant in infection status of pregnant women (Anorlu *et al*., 2001,Uneke *et al*., 2006).The implication of this is that efforts geared towards the prevention of this infection should be targeted at all women of child bearing age especially those within 20-30 years. Literacy level and pregnancy trimester were found to be related to *T. vaginalis* infection ($P < 0.05$). The risk factors associated with significant infection were illiteracy (15.7%), and third–trimester (18.1%) respectively (Table 2 and 3). In two similar studies, the reports of Cotch *et al.,* (1997) that revealed highest prevalence of this infection at mid- trimester disagree with our findings whereas that of Uneke *et al.,* (2006) that recorded highest prevalence of infection at third-trimester supports our findings. The findings of previous studies in Maryland, USA (Cotch *et al.,* 1997) and in Ilorin, Nigeria (Aboyeji and Nwabuisi, 2003) that low level of education was associated with significant *T. vaginalis* infection among pregnant women is in agreement with this report. 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

syndrome and vaginal candidiasis are frequent infections in pregnant women habouring *T. vaginalis* (Uneke *et al*., 2006). Although there

Table 1. Age specific distribution of *T. vaginalis* among pregnant women in Ebonyi State

Age range (years)	Number examined	Number positive	Percentage positive
15-20	112	13	11.6
21-25	352	51	14.5
26-30	273	35	12.8
31-35	180	17	9.4
36-40	108	10	9.3
Total	1,025	126	12.3

(χ^2 = 3.8, P ≥ 0.05, df = 4); χ^2 is the symbol for calculated Chi- square; df means degree of freedom

Table 2. Prevalence of *T. vaginalis* with reference to trimester among pregnant women in Ebonyi State

Trimester	Number examined	Number positive	Percentage positive
First	110	7	6.4
Second	556	54	9.7
Third	359	65	18.1
Total	1,025	126	12.3

(χ^2 = 18.27; P < 0.05; df = 2)

Table 3. Prevalence of *T. vaginalis* with reference to literacy level among pregnant women in Ebonyi State

Literacy level	Number examined	Number positive	Percentage Positive
Non literate	445	70	15.7
Primary	284	28	9.9
Secondary	180	20	11.1
Tertiary	116	8	6.9
Total	1,025	126	12.3

(χ^2= 6.0; P < 0.05; df = 3)

Table 4. Prevalence of *T. vaginalis* with reference to parity among pregnant women in Ebonyi State

Parity	Number examined	Number positive	Percentage Positive
Primigravid	303	56	18.5
Multi gravid	722	70	9.7
Total	1,025	126	12.3

(χ^2= 15.3; P < 0.05)

Table 5. Prevalence of *T. vaginalis* with references to marital status among pregnant women in Ebonyi State

Marital status	Number examined	Number positive	Percentage Positive
Single	177	18	10.2
Monogamous	406	48	11.8
Polygamous	442	60	13.6
Total	1,025	126	12.3

(χ^2 = 1.59: P > 0.05; df = 2)

especially during pregnancy. This is very crucial to maternal health because other vaginal infections such as bacteria vaginosis, or bacterial excess

was no statistical significant relationship between trichomoniasis and marital status of individuals (P≥ 0.05), high prevalence (>10%) of this infection

was reported among the three categories of marital status studied (Table 5). This is worrisome as it reflects a seemingly high rate of it's distribution from infected individuals that may serve as reserviours if left untreated. Also of great epidemiological importance is the high percentage of unmarried or single individuals (17.27%) that participated in this study. This depicts the high rate of promiscuity or premarital sexual relationship prevalent in our setting which may increase the risk of their exposure to infection by other deadly emerging STIs. The highest prevalence (13.6%) of this parasite reported among the polygamous group may suggestively reflect a wide range of cross infection that leaves sexual partners in this group at a higher risk of infection than others. Thus social and cultural practices that promote polygamy in our setting should be discouraged.

In conclusion, the need for the prevention of *T. vaginalis* infection among pregnant women cannot be overstated. The correct use of latex condoms and female diaphragms has been suggested for the control and prevention of trichomoniasis (Adams, 2002). Cleanliness of cloths, personal hygiene and collateral treatment of sexual partners, as well as standard living and education are important in controlling the disease among pregnant women, especially as the organism has been shown to survive for several hours in moist environment, including moist cloths. Trichomoniasis should be stressed during awareness campaign of other sexually transmitted infections (STIs), during ante-natal session as well as at secondary education level to educate the young girls.

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