

Prevalence Of *Trichomonas vaginalis* Among The Rural Women Of Ekwulumili Community Anambra State, Southeastern Nigeria.

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Abstract: A prevalence study of *Trichomonas vaginalis* infection among the rural women of Ekwulumili community in Nnewi South Local Government Area of Anambra State, Nigeria, was carried out between April and July 2012. A total of one hundred women aged 20-59 years, from the four villages of the community participated in the study. The women were mobilized through advocacy visits to the traditional ruler and opinion leaders of the community, town criers and announcements in the churches, schools, markets and women group meetings. All the women were assembled at the Eziokwubundu Maternity Home on the agreed date. An informed consent of every woman was obtained before a sample of the vaginal swab was carefully and aseptically collected from the high vaginal area using a well-labeled, sterile, non-abrassive high vaginal swab stick. Each sample was stored in a test tube containing 5mls of phosphate buffer. All samples were centrifuged and examined microscopically within 2 hours of collection. The presence of *T. vaginalis* was detected by its characteristic jerky movement in a wet preparation. An overall prevalence of 15% was obtained. *T. vaginalis* prevalence varied in the villages, being highest in Owellechukwu 1(25.0%) and least in Urueze 9(13.24%). It also varied with marital groups, being highest among the married women 9(20.93%) and lowest among the singles 3(8.82%). It was highest among the traders 10(23.81%) and lowest among the civil servants 1(9.10%). Among the age groups, prevalence was highest in the age group 30-39 years, 7(35.0%) and lowest among those aged 40-49 years, 2(8.0%). *T. vaginalis* was not detected in pregnant women. Adequate personal hygiene, avoidance of promiscuity, faithfulness to one sexual partner, and health education were suggested for improvement of their health.

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Introduction

Trichomonas vaginalis is an anaerobic flagellate that is parasitic to man. It is the aetiologic agent of the disease trichomoniasis that is sexually transmitted (Johnson and Mebey, 2008). The infection is common in sexually active males and females especially during the child bearing age. Higher prevalence is observed among persons with multiple sexual partners or other venereal diseases (Brown 1992). It is frequently encountered among women complaining of abnormal vaginal discharges and itching.

T. vaginalis has a cosmopolitan distribution having been identified in all racial and socio-economic groups (Brown, 1992). The Center for Disease Control (CDC, 2006) has estimated that *T. vaginalis* is responsible for 7-4 million cases of infection each year in United States of America. Cates *et al* (1999) reported that at least 2-3 million symptomatic cases occur normally among sexually active women in the United States of America. In Africa, it is estimated that 2-5% of the population has the infection

(WHO, 1992a&b). Increasing prevalence of trichomoniasis has been reported in many states of Nigeria including Oyo, Lagos, Sokoto, Plateau and Imo states (Ulogu *et al*, 2007).

T. vaginalis infections are asymptomatic and rare in males but occur mostly in females. The common symptoms include a smelly yellow-green discharge from the vagina, itchy genitals and thighs, swollen labia, painful during sexual intercourse or urination (Jirovec and Petru, 1968). Over 10% of women also experience lower abdominal pain and soreness, some suffer strawberry cervix in which lesions form in the cervix and vagina walls (Cudmore *et al*, 2004). Agboola (2006) reported that *T. vaginalis* infection was originally thought to be innocuous, but has now been associated with pelvic inflammatory disease (PID), preterm labour, premature rupture of membranes and increased perinatal loss. He further reported that the patient may also complain of dyspareunia, post-coital bleeding, pruritis vulvae, frequency of micturition and dysuria. In several cas-

es, cervical erosion, small punctuate haemorrhages and swallow papillae may be found on the cervix and vagina.

Barnley (1976) reported that approximately 5% of female babies born to infected mothers contract the infection. Also, babies born to women infected with trichomoniasis, are born prematurely or with low birth weight (Cudmore, *et al* 2004). *T. vaginalis* infection is also considered an important factor in amplifying Human Immuno-deficiency Virus (HIV) transmission. The parasite also serves as a vector for the spread of other organisms by carrying pathogens attached to their surface into the fallopian tube (Soper, 2004).

Due to the public health importance of *T. vaginalis* infection, and the fact that limited studies have been carried out on trichomoniasis prevalence in Anambra State of Nigeria, this study sought to investigate the prevalence of trichomoniasis in rural women of Ekwulumili community, Nnewi South LGA of Anambra State. The specific objectives were to determine.

1. The prevalence of *T. vaginalis* in the vaginal swabs of women from the different villages of the community and
2. The effects of marital status, occupation, age and pregnancy on the prevalence of trichomoniasis.

Materials and Methods

Study Area

The study was carried out in Ekwulumili community in Nnewi-South Local Government Area of Anambra State, South eastern Nigeria between April and July 2012. The community is about 35km (22 miles) South east of the commercial city of Onitsha. It shares boundaries in the north with Igbo-Ukwu and in the south with Unubi and Ezinifite communities. The geographical co-ordinates for Ekwulumili are 5°.97'N latitude, 7°02'E longitude and 140m (159ft) above sea level. It lies in the rainforest belt of Nigeria and has marked dry and wet seasons. It has 8 months of rainfall (April – November), and an annual rainfall of 2000 – 3000mm. Dry season lasts from December to March. It has an average humidity of 70% throughout the year and a maximum temperature range of 20 – 30°C in wet season. Ekwulumili community is made up of four villages namely, Owellechukwu, Isigwu, Ureuze and Umudim.

Ekwulumili has a population of about 50,000 citizens (Ohimili, 2012). Most indigenes reside outside the town and do their businesses in numerous cities across Nigeria and the rest of the world. They however, maintain homestead and extended families in the town and visit the town regularly for short stays usually during holidays and ceremonial periods. The majority of Ekwulumili dwellers are traders and

farmers. Most people combine petty trading with subsistence farming.

Advocacy and Community mobilisation

Advocacy visits to the traditional ruler of the community, HRH G.O Umeanadu, Eze Onyeorulu 1 of Ekwulumili, and his cabinet, the President general of Ekwulumili Development Union (EDU) and the Proprietor of Eziokwubundu Maternity Home with introductory letters from the Head of the Department of Parasitology and Entomology, Nnamdi Azikiwe University, Awka helped to obtain both permission to carry out the research and co-operation of the people, the participants were mobilized through town criers and public notices made in the churches, schools and market places. Informed consent of each participant was obtained before the high vaginal swab sample was collected.

Selection of the Study Participants

The participants were drawn from the four villages of the community. The number of participants from the four villages were unequal with 68 women from Ureuze village, 15 women from Umudim, 13 women from Isigwu and 4 women from Owellechukwu. A total of 100 women were examined. They were assembled at the Eziokwubundu Maternity Home for examination.

Collection of the Biodata of the Participants

The bio-data of the participants such as name, age, village, pregnancy status, occupation and marital status were obtained through direct interviews and data was recorded in a field note book. The participants were apparently healthy people without any obvious signs or symptoms of *Trichomonas vaginalis* infections.

Parasitological Techniques

Samples of vaginal discharge were carefully collected aseptically from the high vaginal area using a well labeled, sterile, non-abrasive swab stick. Samples were placed into separate tubes containing 5ml of phosphate buffer. The samples were transported to the parasitology laboratory of the Department of Parasitology and Entomology, Nnamdi Azikiwe University Awka for examination and parasite diagnosis, within 2 hours of collection.

Identification of *Trichomonas vaginalis*

The suspension containing vaginal secretion was poured into a test tube and centrifuged three minutes at 2000 rotations per minute (2000 rpm). The supernatant was discarded and the sediment was examined. A drop of the sediment was then placed on a clean grease-free slide covered with cover slip and examined microscopically with low power (x10) and high power (x40) objectives. The presence of *T. vaginalis* was detected by the characteristic jerky movement of the parasite and identified using the characteristic four flagella, axostyle and oval shape.

Statistical Analysis

The differences in the prevalence of *T. vaginalis* in the various groups of the participants were tested using analysis of variance (ANOVA) statistical package.

Results

Of the 100 women examined for *T. vaginalis* infection, 15(15.0%) were positive while 85(85.0%) were negative.(Table 1).

T. vaginalis prevalence by the villages was 9(13.24) in Urueze village, 3 (20.0%) in Umudim village, 2(15.38%) in Isigwu village and 1(25.0%) from Owellechukwu village. Among these villages, the highest prevalence of *T. vaginalis* 1(25.0%) was from Owellechukwu while the least prevalence 9(13.24%) was from Urueze village. Although *T. vaginalis*

infection was slightly higher in Owelleukwu than in other villages but they were not statistically significant ($P \geq 0.05$).

Table 1: Prevalence of *T. vaginalis* in women from the four villages of Ekwulumili community

Name Village	Participants Ex-	Participants Infected	
	amined	No	%
	No	No	%
Urueze	68	9	13.24
Umudim	15	3	20.0
Isiagwu	13	2	15.5
Owellechukwu	4	1	25.0
Total	100	15	15.0

The prevalence of *T. vaginalis* by marital status is shown in table 2. Among the 34 single women examined, 3(8.82%) were positive while 31(91.18%) were negative. Among the 43 married women examined, 9(20.93%) tested positive with *T. vaginalis* while 34(79.07%) did not. Of the 23 widows examined, 3(13.04%) were positive while 21(86.96%) were negative. The married women still living with their husbands had the highest prevalence of *T. vaginalis* 9(20.93%) while the least prevalence of 3(8.82%) was observed among the singles. *T. vaginalis* infection was significantly higher among the married women than the singles and widows. ($P \leq 0.05$)

Table 2: Prevalence of *T. vaginalis* according to the marital status of the participants

Marital Status	Participants Examined	Participants Infected	
	No	No	%
Single	34	3	8.82
Married	43	9	20.93
Widowed	23	3	13.04
Total	100	15	15.0

The prevalence of *T. vaginalis* by occupation is shown in table 3. Of the 14 female students examined, none was positive with *T. vaginalis*. Among the 42 traders examined, 10(23.81%) were positive while 32 (76.19%) were negative. Of the 11 civil servants examined, only 1(9.1%) was positive while 10(90.90%) were negative. Among the 17 farmers examined, 2(11.76%) were positive while 15(88.24%) were negative. Of the 16 unemployed women examined, 2(12.50%) were positive while 14(87.51%) were negative. Of all the five occupational groups that participated in the study, the highest prevalence of *T. vaginalis* prevalence of 10(23.81), was observed among the traders while the least prevalence 1(9.10%), was observed among the civil servants. *T. vaginalis* infection was significantly higher among the traders than in other occupational groups. ($P \leq 0.05$)

Table3: Prevalence of *T. vaginalis* according to occupation of the participants.

Occupation	Participants Examined	Participants Infected	
	No	No	%
Students	14	-	-
Traders	42	10	23.81
Civil Servants	11	1	9.1
Farmers	17	2	11.8
Applicants	16	2	12.5
Total	100	15	57.2

T. vaginalis prevalence in the different age groups is shown in table 4. Of the 27 women in the age group 20-27 years, none was positive. In the age group 30-39 years, 7(35.0%) of the 20 women examined were positive. Of the 25 women examined in the age group 40-49years, 2(8.0%) were positive. Of the 28 women examined in the age group 50-59 years, 6(21.43%) were positive. *T. vaginalis* infection was significantly higher in reproductive women aged 30-39years than in other age groups ($P \leq 0.05$)

Table 4: Prevalence of *T. vaginalis* according to the age of participations.

Age groups	Participants Examined	Participants Infected	
	No	No	%
20-29	27	-	-
30-39	20	7	35.0
40-49	25	2	8.0
50-59	28	6	21.43
Total	100	15	15.0

The prevalence of *T. vaginalis* infection among the pregnant and non-pregnant women participants is shown in table 5. Of the eight pregnant women exam-

ined for *T. vaginalis* infection, none was found to be positive, while 15(16.30%) of the 92 non-pregnant women examined were positive. *T. vaginalis* was observed in non-pregnant women only. *T. vaginalis* infection was significantly higher in non-pregnant women ($P \leq 0.05$).

Table 5: Prevalence of *T. vaginalis* among the pregnant and non-pregnant women participants.

Group	Participants Ex-	Participants In-	
	amined	fectected	
	No	No	%
Pregnant	8	-	-
Non-pregnant	92	15	16.3
Total	100	15	16.3

Discussion

An overall *T. vaginalis* prevalence of 15.0% was observed among the 100 women from the four villages of the community. The result is in tandem with that of Obiukwu *et al* (2010) who observed a prevalence of 13.3% among 300 females studied at Umunze Community in Orumba Local Government Area Of Anambra State, Nigeria. It is also higher than the observations of Gundiri and Okwuosa (2005) who Observed *T. vaginalis* prevalence of 3.3% among the women of Kwampe Community of Plateau State of Nigeria. On the contrary, the result is lower than that of Ulogu *et al* (2007) who observed a Pevalence of 21.53% among the women in Nnewi community in the same Local Government Area with Ekwulumili Community. The rate observed in the present study is also lower than that of Anosike *et al*(1993) and Njoku *et al* (2010) who observed a prevalence of 24.70% and 19.26% respectively, among students of higher instutions in Nigeria. Similar observations were also made among pregnant and non-pregnant women in Plateau State of Nigeria by Ogbonna *et al* (1991) in Benin City, Edo State of Nigeria by Ibehi *et al* (2000). The present rate could not be said to be within the normal range in a healthy women population nor could it be considered very high. Thus, the present situation could be attributed to rapid globalization associated with the present age. As noted earlier, most men of the community do business within and outside Nigerian cities and at the same time maintain their families in the villages and visit them at will. It is likely that the easy with the increased volume and efficiency of domestic and global travels with associated human interaction might have contributed to the slight increase in the prevalence of the disease in rural communities.

Trichomoniasis prevalence of 15.0% observed in this study could be considered to be slightly higher than the normal range in a healthy women popula-

tions. Cameron and Padia (1999) observed that trichomoniasis prevalence ranges from 5-10% in healthy women populations as high as 50% in prostitutes and female prisoners. Also the World Health Organisation noted that the prevalence range of *T. vaginalis* in Africa is 2-5% (WHO,1992) Since *T. vaginalis* is transmitted mainly through sexual intercourse but occasionally through contaminated towels, medical examination instruments and douche equipments (Javietz *et al* 2006) it is likely that they were infected through sexual intercourse as well as exposure to contaminated medical equipments hence the community is a rural area with ill-equipped medical units.

All the women examined were apparently healthy without complaints of any signs and symphoms associated with *T. vaginalis* infection. Jarvietz *et al* (2006) showed that most infections are asymptomatic or mild. Smyth (1996) reported that trichomoniasis is asymptomatic in about 50-70% of infected people and apparently harmless to some individuals. In Zimbabwe, South Africa Mbizro *et al* (2001) observed that 75% of women who were found to be asymptomatic on questioning, were 16% *T. vaginalis* positive on laboratory diagnosis. Although trichomoniasis is now recognized as a serious public health problem, it was originally thought to be innocuous (Agboola 2006) The apparently innocuous nature of the infection could be responsible for its increase in the population since it may be taking for granted by most victims.

T. vaginalis infection varied in the villages. The highest prevalence of 25.0% was recorded in Owelleukwu village and the least, 13.24% in Urueze village. This is in agreement with the observations of Thomas and King (1985) who reported that *T. vaginalis* differs with age, sex, and location. The authors further reported that *T. vaginalis* prevalence varies in different populations depending on the section of the population studied and also the diagnostic method employed in the study. The present study was carried out by examining the saline wet mount of the high vaginal swabs of the participants under the light microscope using x10 and x40 objectives. Agboola (2006) observed that this method detects only 64.0% infection in asymptomatic women. It could be that most of the infections were not detected as a result of the technique employed

The prevalence of trichomoniasis among the age groups in the community varied from 8.0% among those aged 40-49 years to 35.85% among the age group 50-59 years. The peak incidence of trichomonal infections is usually between 16 and 35 years of age (Naguils, 1996). Njoku *et al* (2000) recorded highest number, 26% among female students aged 26-35 years of age. Birch and Rees (1989)

observed that *T. vaginalis* infection is widely distributed among individuals between 20 and 45 years of age. But, Cameron and Padia (1999) reported that the incidence of trichomoniasis depends on sexual activities hence *T. vaginalis* is transmitted primarily by sexual intercourse.

A relatively high prevalence of *T. vaginalis* (21.43%) was observed among those aged 50-59 years. This increase in postmenopausal women could be attributed to persistence of earlier infections in asymptomatic women. In addition, to poor personal hygiene, Obiajuru (2004) attributed this to histories of previously sexually transmitted infections, prostitution, pregnancy and drug use among other predisposing factors. The prevalence of *T. vaginalis* infections among the occupational groups in the community varied from 11.28% among the civil servants to 23.81% among the traders. Obiukwu *et al* (2010) observed that when occupation was associated with *T. vaginalis* infection, the highest prevalence was observed among the students (6.7%), followed by traders (2.7%) and least among the Civil servants (1.3%). The word 'trader' is an all-encompassing word irrespective of trade. It could be that some of the women traders studied were commercial sex workers posing themselves as traders. *T. vaginalis* prevalence ranges from 5-10% in healthy women and as high as 50% among prostitutes and female prisoners (Cameron and Padia, 1999). Socio-economic factors such as low level of education appear to be associated with higher prevalence rate of trichomoniasis. Also an increased risk of infection has been demonstrated in individuals with multiple sex partners, poor personal hygiene and low socio-economic status (Thomas and King, 1985).

T. vaginalis prevalence also varied with the marital status of the women, being highest among the married women 9 (20.93%) and least among the singles 3(8.82%). *T. vaginalis* is a sexually transmitted disease. Brown (1992) reported that at least 2-3 million symptomatic infections occur normally among sexually active women. Increased risk was found in individuals with multiple sex partners, poor hygiene and during pregnancy (Barch and Rees, 1989). It could be that some of the women studied were from polygamous families. Also the use of oral contraceptives which is now widely used by women for the control of family size could be a predisposing factor. Contraceptives alter the normal environment of the vagina and reduce the normal lubricating secretions thereby causing trauma or damage to the vaginal wall through which sexually transmitted pathogens like *T. vaginalis* may enter the body (Agboola 2006).

T. vaginalis infections were not detected in pregnant women while a prevalence of 15(16.30%)

was observed among non-pregnant women. Several authors have shown a greater prevalence of trichomoniasis in multiparous women, women who married at an early age and during pregnancy. This is because the growth and multiplication of *T. vaginalis* is optimal in most milieus with temperatures between 35°C and 37°C and pH between 4.9 and 7.5. Also host factors which increase vaginal pH such as pregnancy, menses and co-incident anaerobic infections in the vaginal wall, appear to encourage the development of symptomatic trichomonal vaginitis (Jirovec and Petru, 1968; Agboola, 2006). The observation in this study is therefore contrary and surprising. It could be that pregnant women do attend antenatal clinics where they were not only educated on sexually transmitted diseases but also were examined and treated in routine antenatal clinics. In the study area, there are at least three such centres in the community, namely; Ekwulumi community Health Centre, Eziokwu bu Ndu Hospital and Maternity, and Hossana Hospital and Maternity where the pregnant women could register.

Trichomoniasis is an unpleasant disease that can go undiagnosed for years and is often transmitted by asymptomatic carriers (CDC, 2006). It is seemingly innocuous in its initial stages of infection but has been reported in many states of Nigeria including Oyo, Sokoto, Plateau, Abia and Imo states (Ulogu *et al*, 2007). Asymptomatic carriers especially males are important sources of transmission. It is therefore suggested that mass diagnosis and treatment coupled with health education will help to reduce the prevalence in the society and improve the health of the people.

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