



Prevalence of *Trichomonas vaginalis* in Urine Samples of Women Attending Chukwuemeka Odumegwu Ojukwu University Teaching Hospital, Awka, Southeastern Nigeria

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Trichomonas vaginalis is transmitted sexually in humans affecting both male and female genital tracts. A cross sectional study to determine the prevalence of *T. vaginalis* infection among women attending Chukwuemeka Odumegwu Ojukwu University Teaching Hospital (COOUTH) Awka, Anambra State was conducted between November 2021 and January 2022. A total of 200 apparently healthy women between the ages of 19 – 42 years volunteered and participated in the study. The study participants included pregnant and non-pregnant women, married, singles and widows from various occupations. Their urine samples were collected, centrifuged and examined under the microscope within 2 hours of collection. Diagnosis was made by detection of *T. vaginalis* in the wet preparation of urine deposits. An overall prevalence of 3.0% was observed among the study participants. Prevalence of *T. vaginalis* was highest (5.9%) among the age group 25-30 years and no infection was observed among the age group 37-42 years. There was no significant

difference in the prevalence of infection among the age groups ($P>0.05$). Highest prevalence of 3.2% was observed among pregnant women while the least (2.7%) was observed in non-pregnant women. There was no significant difference in the prevalence of infection between pregnant and non-pregnant groups ($P>0.05$). The highest prevalence (7.5%) was observed among the students while no infection was observed among the civil servants. There was also no significant difference in the prevalence of infection among the occupational groups ($P>0.05$). Married women recorded the highest prevalence (3.3%) and no infection was observed among the widows. There was no significant difference in the prevalence of infection in different marital status ($P>0.05$). Asymptomatic *T. vaginalis* infection is common in pregnant women. Routine screening for this infection during pregnancy is recommended in order to reduce potential adverse pregnancy outcomes.

Keywords: *Trichomonas vaginalis*; women; prevalence; COOUTH; asymptomatic; Awka.

1. INTRODUCTION

Trichomonas vaginalis causes a sexually transmitted infection in humans [1,2]. The parasite causes the disease known as trichomoniasis and is prevalent world-wide. Trichomoniasis is usually characterized by yellowish green discharge which is often foul smelling. It also presents with dysuria, vulvo-vaginal irritation and lower abdominal pain in female patients [3]. Although cosmopolitan in distribution, trichomoniasis has not received adequate public health attention [4].

T. vaginalis infection can lead to complications in both pregnant and nonpregnant women. Such complications may include premature labour and rupture of membranes, low birth weight, postabortion infections, urinary tract infection, oral lesions and pneumonia [5,6]. There are several epidemiological factors that contribute to the prevalence of *T. vaginalis*. Such factors have been reported to include poor personal hygiene, multiple sexual partners, low level of education, under development and low socio-economic status [7,8].

It has been estimated that about 180 million persons are affected yearly by the disease [6]. In Nigeria, prevalence of *T. vaginalis* has specifically been reported to be due to poverty and an increasing practice of unprotected sex mainly among commercial sex workers [9]. Several studies have reported *T. vaginalis* mostly in women [3,6,8,10].

The frequency of co-infection of *T. vaginalis* with other Sexually Transmitted Infection (STIs) makes it a compelling public health concern. *T. vaginalis* is associated with an increased risk of infection with several other STIs such as

gonorrhoea, human papilloma virus (HPV), herpes simplex virus (HSV), and Human Immuno-deficiency Virus (HIV) [11]. Infection can last from months to years in individuals when left untreated.

Treatment of trichomoniasis by oral administration of single dose of 2mg Metronidazole has been the first line of treatment. Related drugs such as Tinidazole and Secnidazole are also recommended as being effective [12]. Before mass administration of chemotherapy, there is need to investigate the prevalence of infection in an area. Therefore, this study was to determine the prevalence of *T. vaginalis* in women attending Chukwuemeka Odumegwu Ojukwu University Teaching Hospital, Amaku, Awka, Anambra State.

2. MATERIALS AND METHODS

2.1 Study Area

This investigation was conducted at Chukwuemeka Odumegwu Ojukwu University Teaching Hospital (COOUTH), Amaku, Awka South Local Government Area (LGA), Anambra State, Nigeria. The hospital lies between the latitude 6.2°N and longitude 7.1°E. The LGA is made up of nine communities, namely Amawbia, Awka, Ezinato, Isiagu, Mbaukwu, Nibo, Nise, Okpuno and Umuawulu. The LGA has a population of 189,654 inhabitants made up of indigenes and migrants living in the nine communities [13]. All inhabitants of the LGA access health care in COOUTH, although there are other Primary Health Care Centres (PHCC) in the area. Awka South LGA experiences two distinct seasons in a year, a wet season (March – October) and dry season (November - February) with annual rainfall between 152 cm and 203 cm. Average daily minimum temperature

for the area is 22°C, with a maximum temperature of 34°C. The inhabitants are traders, farmers, artisans and blacksmiths. Others are civil servants.

2.2 Study Design

The study was a cross sectional study on prevalence of *T. vaginalis* infection carried out among female patients attending COOUTH between November 2021 and January 2022.

2.3 Study Population and Sample Size

A total of 200 female patients within the age of 19-42 years volunteered and participated in the study. They were women who attended the hospital between November 2021 and January 2022. The purpose of the study was explained to them and their written consent was obtained. They were also assured of the confidentiality of the individual data obtained.

2.4 Sample Collection

Mid-stream urine of the study participants was collected using standard laboratory procedures described by Cheesbrough [14]. Samples were collected using sterile universal container. The samples were transported to the laboratory of the Department of Parasitology and Entomology, Nnamdi Azikiwe University, Awka, immediately, and was examined within 2 hours of collection.

2.5 Parasitological Techniques

The urine samples were examined in the laboratory using the method described by Cheesbrough [14]. The samples were mixed gently to ensure homogeneity, transferred into a 10ml test tube and centrifuged. The supernatant was decanted and a drop of the re-mixed deposit was placed on a clean grease free slide, covered with a clean glass cover slip and viewed under the microscope using x10 and x40 objective lenses. *T. vaginalis* parasites were identified using their gross morphology and characteristic motility.

2.6 Data Analysis

Data obtained was analysed using SPSS 26. The differences in the prevalence of *T. vaginalis* in the various categories were tested using Chi square at 95% significance.

3. RESULTS

A total of 200 women were examined for *T. vaginalis*. Of this number, 6(3.0%) were positive for the parasite (Table 1). Age group 25-30 years had the highest prevalence, 2(5.9%) while age group 37-42 years had no infection with the parasite (Fig. 1). There was no significant difference in the prevalence of *T. vaginalis* among the different age groups ($\chi^2= 1.3$, df= 3; $P >0.05$). Out of the 126 pregnant women examined for *T. vaginalis*, 4(3.2%) were positive. Also, of the 74 non pregnant women examined, 2(2.7%) were positive (Fig. 2). The difference in prevalence of *T. vaginalis* among the pregnant and non-pregnant women was not significant ($\chi^2=1.4$, df= 1; $P >0.05$). In occupation groups, students had the highest prevalence of *T. vaginalis* 2(7.4%) while no infection was observed among the civil servants (Fig. 3). There was no significant difference in prevalence among the occupations ($\chi^2= 1.3$, df= 3; $P >0.05$). Married women had the highest prevalence, 4(3.3%) of *T. vaginalis* while widows had no infection with the parasite (Fig. 4). There was no significant difference in prevalence among marital status groups ($\chi^2=0.27$, df= 2; $P >0.05$).

4. DISCUSSION

An overall prevalence of 3% of *T. vaginalis* observed in this study is adjudged low and is within normal range for healthy adult women [15]. The low prevalence observed agrees with some other studies. Onyido et al. [2] observed 1.0% in apparently healthy women in Ihiala. Uneke et al. [10] observed 2.8% in Ebonyi, while 3.3% was reported in Lagos by Adeoye and Akande [16]. But the observation differs from Onyido et al. [8] who reported a higher prevalence of 15% in Ekwulumili and Iwueze *et al.* [3] who reported 17.5% in Onitsha using high vaginal swabs (HVS) samples. Bowden and Garnett [17] reported that the prevalence of *T. vaginalis* varies based on settings and locations. Also, variations in socioeconomic status could influence prevalence of *T. vaginalis* in different locations [7,8]. The type of sample used in diagnosis may also determine prevalence rate. This may explain the variation in the findings of this study when compared with others, who used HVS samples in their studies. Using urine sample for diagnosis of *T. vaginalis*, though cheaper and more rapid may be less sensitive [18]. This may also suggest why low prevalence of *T. vaginalis* was observed in this study even when the study was conducted among women attending a hospital.

Table 1. Prevalence of *Trichomonas vaginalis* among women attending Chukwuemeka Odumegwu Ojukwu University Teaching Hospital, Awka, Anambra State, Nigeria

Groups	Number Examined	Number Positive (%)
Age (years)		
19-24	42	2
25-30	34	2
31-36	94	2
37-42	30	0
Total	200	6(3.0)
Pregnant	126	4
Non-pregnant	74	2
Total	200	6(3.0)
Traders	94	2
Civil servants	14	0
Students	28	2
House wives	64	2
Total	200	6(3.0)
Single	62	2
Married	122	4
Widowed	16	0
Total	200	6(3.0)

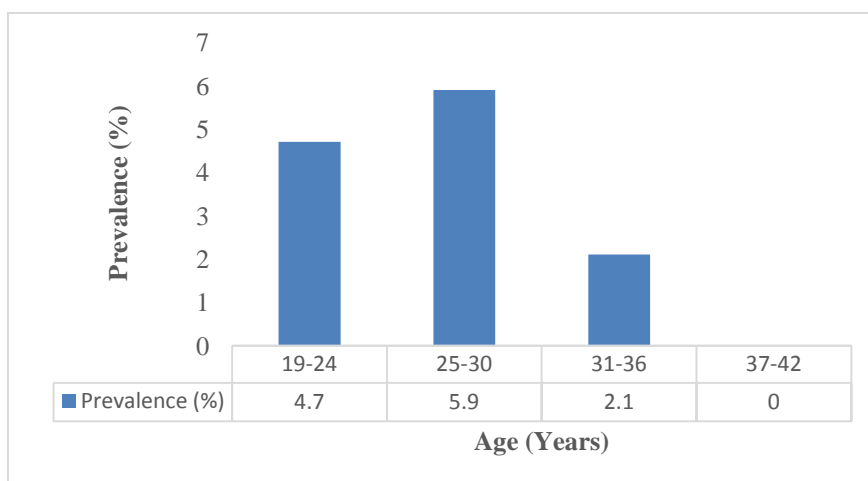


Fig. 1. Distribution of *T. vaginalis* in relation to age groups of the study participants

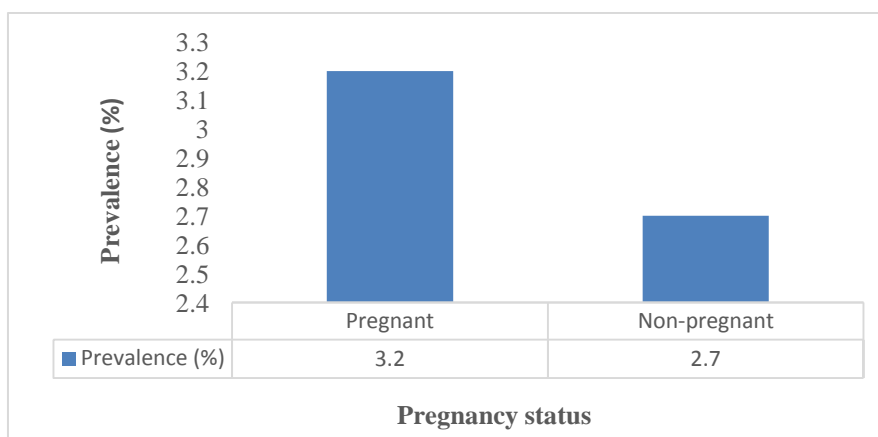


Fig. 2. Distribution of *T. vaginalis* in relation to pregnancy status of the study participants

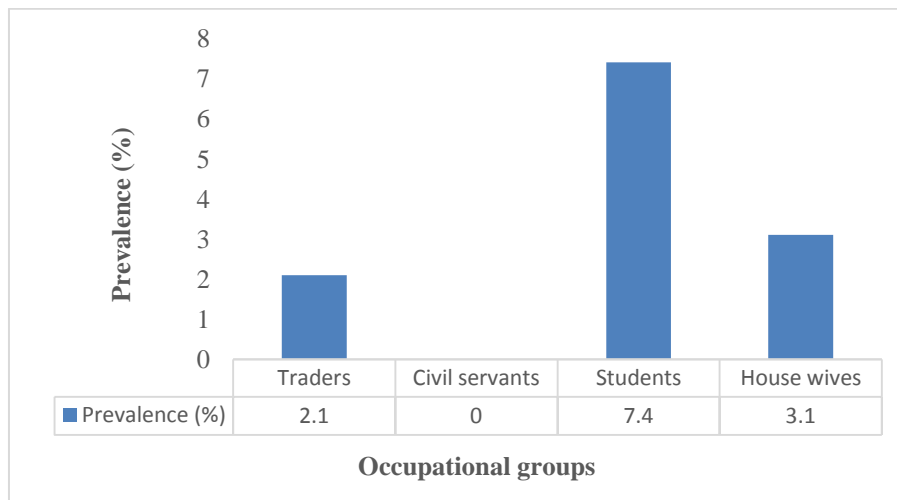


Fig. 3. Distribution of *T. vaginalis* in relation to occupational groups of the study participants

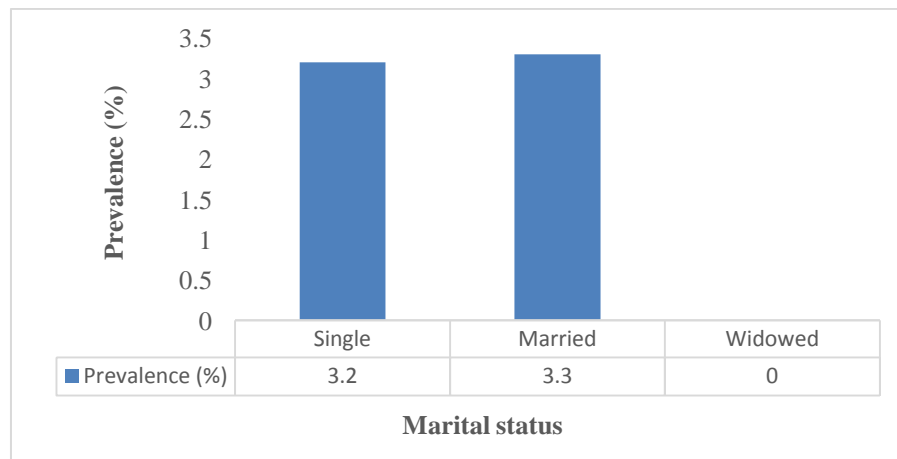


Fig. 4. Distribution of *T. vaginalis* in relation to marital status of the study participants

The highest prevalence was observed in the age group 25-30 years. This falls within the range observed by Amadi and Nwagbo [19], where age group 21-30 years recorded the highest prevalence of *T. vaginalis* infection. WHO [20] reported that incidence of STIs including *T. vaginalis* is highest among age group 15-30 years which is the most sexually active age group [15]. This is in tandem with the findings of this study.

In this study prevalence of 3.2% was observed among pregnant women. This is lower than 6.17% observed by Auta et al. [21] among pregnant women attending two different hospitals in Kaduna metropolis. But the current result compares favourably with 2.8% observed by Akinbo et al. [6] among pregnant women attending antenatal clinic at the University of Benin Teaching Hospital. The observation of

asymptomatic *T. vaginalis* infection among pregnant women is a cause for concern giving the implications of the parasite during pregnancy. It has earlier been reported that *T. vaginalis* infection can lead to premature labour, rupture of membranes and low birth weight [5,6].

Students had the highest prevalence when compared to other occupational groups. This finding however does not agree with Iwueze et al. [3] and Amadi and Nwagbo [19] who reported highest prevalence among traders. The highest prevalence in students observed in our study could be as a result of increased promiscuity among young females of school age. In this study *T. vaginalis* prevalence of 3.3% was observed among married women. The observation is slightly higher than 2.42% observed among pregnant women in Benin City [6].

5. CONCLUSION

The findings of this study were made on apparently healthy women attending hospital for other health issues. This confirms the asymptomatic nature of the *T. vaginalis* infection. It is therefore pertinent that diagnosis for the infection be included in the routine tests for women especially the pregnant ones. There is also need for health education to women on the implications of *T. vaginalis* infection. Chemotherapy is also recommended.

CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

Ethical approval to conduct this study was obtained from the Health Research and Ethics Committee of COOUTH (Ref. No. COOUTH/CMAC/ETH.C/VOL.1/FN:04/154).

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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