

### Short Communication

## Prevalence of *Trichomonas vaginalis* Infection among Pregnant Women in Abeokuta, Nigeria

Ojurongbe Olusola<sup>1\*</sup>, Taiwo Bolaji O<sup>2</sup>, Dina Babatunde O<sup>3</sup>, Sina-Agbaje Olawunmi R<sup>2</sup>, Bolaji Oloyede S<sup>1</sup> and Adeyeba Adegboyega O<sup>1</sup>

<sup>1</sup>Department of Medical Microbiology and Parasitology, College of Health Sciences, Ladoké Akintola University of Technology, Osogbo, Nigeria, <sup>2</sup>Department of Microbiology and Parasitology, Ogun State Hospital, Abeokuta, <sup>3</sup>Department of Obstetrics and Gynaecology, Ogun State Hospital, Abeokuta, Nigeria

### ABSTRACT

Trichomoniasis caused by *Trichomonas vaginalis* has emerged as one of the most common sexually transmitted infections. The infection may lead to an important complication in pregnancy, as it has been related with prematurity and low birth weight. The aim of this study was to determine the prevalence of *T. vaginalis* among Nigerian women attending ante natal clinic at the State Hospital, Abeokuta. A cross-sectional descriptive study was conducted among two hundred (200) pregnant women attending ante-natal at Ogun State Hospital, Abeokuta. High vaginal swabs (HVS) and urine samples were collected from consenting pregnant women and examined for the presence of *T. vaginalis* under the microscope. Out of 200 women, a total of 40 (20%) were found to be infected with *T. vaginalis*. The women between the age group 20-30 had the highest prevalence of 21.3% while age group >20 years had the lowest of 12.5% but the difference was not statistically significant. Women in second trimester had the highest prevalence of 25% while those of first trimester were the lowest with 18%. Results obtained from comparing HVS and urine microscopy in this study showed that HVS had a prevalence of 40% compared to urine microscopy (5.5%) and the difference in their detection was statistically significant  $p=0.0041$ . These results may be useful for health authorities, especially for ante-natal care and protection against STDs. The higher recovery rate obtained by using HVS microscopy confirms its advantage over urine microscopy.

**Keywords:** Nigeria, Pregnant women, Prevalence, Sexually transmitted disease, *Trichomonas vaginalis*

Received 27 August 2010/ Accepted 11 November 2010

### INTRODUCTION

*Trichomonas vaginalis*, the etiologic agent of human trichomoniasis, is a protozoan parasite that infects the human urogenital tract leading to the most common non-viral sexually transmitted disease (STD). Approximately 180 million women worldwide are infected with *T. vaginalis* annually (Bowden and Garnett, 2000). The infection may lead to an important complication in pregnancy, as it has been related with prematurity and low birth weight (Berg *et al.*, 1984). The disease is primarily transmitted through sexual contact and the incidence depends on the population screened and certain factors such as poor personal hygiene, multiple sex partners, low

socio-economic status and under- development (Huppert, 2009).

Historically, the presence of *T. vaginalis* has been viewed as a risk marker for other sexually transmitted agents such as *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, or bacterial vaginosis (Wolner-Hanssen *et al.*, 1989; Petrin *et al.*, 1998). Its importance is also being reassessed in the light of recent evidence that it is associated with adverse pregnancy outcome and facilitates the sexual transmission of HIV infection (Mabey *et al.*, 2006; McClelland *et al.*, 2007).

Reports have also implicated *T.vaginalis* in upper reproductive tract post surgical infections,

\*Corresponding author: Tel: +234 7031340486; E-mail: [stojurongbe@yahoo.com](mailto:stojurongbe@yahoo.com)

reversible infertility, neonatal morbidity and mortality (Laga *et al.*, 1993; Draper *et al.*, 1995; Pastorek *et al.*, 1996). Infection with *T. vaginalis* is also increasingly been recognised to be associated with reproductive tract complications including sepsis that occur after abortion and after Cesarean Section (Minkoff *et al.*, 1984), as well as adverse pregnancy outcome (Cotch *et al.*, 1997).

*Trichomonas vaginalis* is detectable in vaginal, prostatic or urethral secretions, semen and urine of infected individuals using different laboratory methods such as wet mount, various staining methods, culture, latex agglutination, Enzyme-Linked Immunosorbent Assay (ELISA) and more recently, Polymerase Chain Reaction (PCR) (Radonjic *et al.*, 2006). The most common means of diagnosis still remains microscopic visualisation of the motile trichomonads in a saline preparation of the vaginal fluid (Schwebke and Burgess, 2004). Direct examination of wet mount preparation of clinical specimen is the most rapid and least expensive technique for identifying *T. vaginalis*. The objective of this study therefore, is to determine the prevalence of trichomoniasis among pregnant women using microscopic examination of High Vaginal Swab (HVS) and urine.

## MATERIALS AND METHOD

### Specimen Collection and Examination

The study population comprises of pregnant women aged 16-40 years attending the antenatal clinic at the State Hospital, Abeokuta. A clinical examination of the lower genitourinary tract for signs of infection such as vaginal discharge was carried out by a gynaecologist during routine ante-natal visits. Incidental clinical signs, age and occupation of each of these patients were also noted. High vaginal swab and urine sample were collected from each consenting pregnant women. Vaginal exudates were collected using a sterile swab stick aided with sterilised speculum. Wet preparations of the vaginal exudates were made using a drop of normal saline on microscope slide covered with a cover slip and examined immediately under the microscope. Also, each urine specimen was thoroughly mixed and 15ml aliquot was centrifuged at 3,000rpm for 10 minutes. The supernatant were discarded and one drop of the sediment was placed on a glass slide and covered with a cover slip. The preparation was examined for the presence of *T. vaginalis* under the microscope.

*Trichomonas vaginalis* was identified with its characteristic morphology and darting motility movement.

### Statistical Analysis

Data were entered into Microsoft excel and analyzed. Proportions were compared by Chi-square ( $\chi^2$ ) with Yates` correction or by Fisher's exact tests using Graph-pad InStat of Graphpad software Incorporation USA. A *p*-value of <0.05 was taken as significant.

## RESULTS

During the period of study, 200 pregnant women attending ante-natal clinic of the State Hospital, Abeokuta were screened for *T. vaginalis*. A total of 40 (20%) were found to be infected with *T. vaginalis* as determined by the HVS microscopy. The age distribution of the occurrence of the parasite is shown in Table 1. The women between the age group 20-30 had the highest prevalence of 21.3% while age group >20 years had the lowest of 12.5%. The difference was however not statistically significant (*p*=0.6548). Prevalence of *T. vaginalis* according to gestational age of the pregnant women shows that women in second trimester had the highest prevalence of 25% while those of first trimester were the lowest with 18% (Table 2).

**Table 1: Distribution of *Trichomonas vaginalis* among Pregnant Women by Age**

Age range (Yrs)	No. Examined	No. Positive	Prevalence (%)	<i>P. value</i>
>20	16	2	12.5	0.6548
20-30	150	32	21.3	
31- 40	34	6	17.6	
<b>Total</b>	<b>200</b>	<b>40</b>	<b>20</b>	

**Table 2: Distribution of *Trichomonas vaginalis* among Pregnant Women by gestational age of Pregnancy**

Age of Pregnancy	No. Examined	No. Positive	Percentage (%)	<i>P. value</i>
1 <sup>st</sup> Trimester	130	24	18	0.6645
2 <sup>nd</sup> Trimester	40	10	25	
3 <sup>rd</sup> Trimester	30	6	20	
<b>Total</b>	<b>200</b>	<b>40</b>	<b>20</b>	

The difference in the gestational age of pregnancy was not statistically significant ( $p=0.6645$ ). Vaginal discharge, dysuria and irritations were the clinical symptoms noticed among the patients. All the positive patients presented with at least one symptom. Vaginal discharge was the most frequent symptom observed among the patients and it also had the highest positivity rate for *T. vaginalis* (Table 3). The difference in their clinical manifestation was not statistically significant ( $p=0.1666$ ). Table 4 shows the differences in the results obtained from the two different sample sources (HVS and Urine) used in this study. HVS had a prevalence of 40% compared to urine microscopy (5.5%) and the difference in their detection rate was statistically significant ( $p=0.0041$ ).

**Table 3: Distribution of *Trichomonas vaginalis* among Pregnant Women by Clinical Manifestation**

Symptoms	Frequency	Positive	Percentage (%)	P-value
Vaginal discharge	60	27	45	0.1666
Dysuria	30	10	33.3	
Irritation	15	3	20	
<b>Total</b>	<b>105</b>	<b>40</b>	<b>38</b>	

**Table 4: Distribution of *Trichomonas vaginalis* among Pregnant Women by Sampling Method**

Specimen	No. Examined	No. Positive	P-value
High vaginal swab	200	40 (20%)	< 0.0001
Urine	200	11 (5.5%)	

## DISCUSSION

The effects of *T. vaginalis* on pregnancy outcome have been known for many years and are now receiving increased attention (Fouts and Kraus, 1980; Huppert, 2009). It is believed that the treatment of women with *T. vaginalis* in pregnancy may reduce the incidence of premature rupture of membranes, premature labour and other clinical conditions associated with the infection (Johnston and Mabey, 2008; Schwandt *et al.*, 2008). It is therefore becoming increasingly important to regularly determine the status of pregnant women with regards to *T. vaginalis* infection. In this study, 40(20%) of the pregnant women were found to have *T. vaginalis*

infection. This prevalence is relatively high, given that some published literature indicates that there has been a consistent decline globally (UN, 1998; Riedner *et al.*, 2006) with results varying from 0% to 40%. Keeping in mind that this infection can be a cause of premature childbirth and indirectly a cause of newborn deaths, early diagnosis via periodical examination of women in developed countries may therefore help in minimising infection with *T. vaginalis* (Eschenbach and Hillier, 1989).

The prevalence of trichomoniasis in this study varied by age and reflects similarity to other STDs like gonorrhoea, chlamydial infection and bacterial vaginosis. Trichomoniasis was found to be more prevalent (21.3%) in women within the age bracket of 20 – 30 in this study. This observation agrees with the findings of other studies and supports the fact that age is a risk factor for STDs in sexually active women around this age group (Sobel, 1997). Variation in prevalence in relation to age could be explained by many factors, like health behaviour of the women, their ability to present to a physician, availability of treatment in case of infection, and their awareness and knowledge of the disease.

Forty-five percent (45%) of the patients infected with trichomoniasis had vaginal discharge, 33.3% had pain while passing urine while 20% had irritation while passing urine. Similar observation was recorded by Wolner-Hanssen *et al.* (1989) where 42% had vaginal discharge. Several studies have also associated *T. vaginalis* with symptoms of yellow vaginal discharge and vulva irritation, as well as signs of purulent vaginal discharge, and vulva and vaginal erythema (McLellan *et al.*, 1982; Hammill, 1989; Wolner-Hanssen *et al.*, 1989).

Currently, the “gold standard” for the diagnosis of trichomoniasis is culture and traditionally, this has been accomplished though cultivation in Diamond’s medium, which is not widely available and thus used mainly for research purposes. However, new commercially available cultural methods have been shown to be as good as the traditional research method (Draper *et al.*, 1995). The most common means of routine diagnosis still remains microscopy. This study has demonstrated that HVS microscopy has a better detection than urine microscopy. This result agrees with what has been previously shown by other authors (Sharma *et al.*, 1991; Stary *et al.*, 2002).

This implies that accurate diagnosis of trichomoniasis in the routine laboratory could be better achieved by HVS rather than urine analysis. In conclusion, this study observed a high frequency of *T. vaginalis* and its associated clinical symptoms among pregnant women in Abeokuta, Nigeria. Also, the study noted that high vaginal swab microscopy showed better detection sensitivity compared to urine microscopy. The most important available options for prevention and control is through reduction in the community prevalence of the disease. This may be better achieved through routine STI screening in pregnancy especially among the young. Routine screening for trichomoniasis should be incorporated into antenatal care. At the same time, there is a need to educate the people on the need for good personal hygiene and safe sex practices.

#### ACKNOWLEDGEMENT

We thank all the consenting patients and management of Ogun State Hospital, Abeokuta.

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