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# Prevalence of *Trichomonas vaginalis* Infection Among Pregnant Women Attending Sheikh Muhammad Jidda General Hospital, Kano State, Nigeria

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ABSTRACT: This paper aimed at assessing the prevalence of *T. vaginalis* infection among two hundred and fifty (250) pregnant women attending Antenatal care unit of Sheikh Muhammad Jidda General Hospital, Kano. Two hundred and fifty (250) samples were collected, using two of the collection procedures which are Mid-stream Urine (MSU) and High Vaginal Swab (HVS). Samples underwent microscopy, after which results were obtained and analysed. Prevalence of *T. vaginalis* infection 15 (6%) out of 250 sampled subjects was obtained. MSU methods detected 6(2.4%) positive, while HVS detected 15 (6.0%) positive for *T. vaginalis* presence. Subjects in the 1st trimester have the highest prevalence of *T. vaginalis* infection, 3 (8.6%) out 35, with the least prevalence among those in the 3rd trimester, 6 (4.4%) out of 137. Multigravidae have relatively higher prevalence of *T.vaginalis* infection of 10 (6.98%) out of 144. Highest prevalence of *T.vaginalis* infection among the age groups was 3 (10.7%) out 28. The study underscores the need for incorporating *T.vaginalis* screening into the antenatal care examination for the purpose of curtailing the menace of the infection in the population.

**Keywords**: *T.vaginalis*, Mid-Stream Urine, High Vaginal Swab,

## Introduction

*Trichomonas vaginalis* is a parasitic protozoan that is the aetiologic agent of trichomoniasis, a Sexually Transmitted infection (STI) of worldwide importance. The infection encompasses a broad range of symptoms ranging from a state of severe inflammation and irritation with frothy malodorous discharge to a relatively asymptomatic carrier state (Briselden and Hiller, 1994). Women infected during pregnancy are predisposed to premature rupture of the placental membrane, premature labour and Low Birth Weight (LBW) infants (Costello *et al*.,1993). Also linked to the infection are cervical cancer (Gorell, 1985; Kerscher and oesterhelt, 1980), typical Pelvic Inflammatory Diseases (PID)(Heath, 1981) and infertility (Gram *et al*., 1992; Grodstein *et al*., 1993).

As with other STIs, *T. Vaginalis* infection can augment the predisposition of individual to Human Immunodeficiency Virus (HIV) infection (Kulda *et al*., 1993). Laga *et al*. (1991) found that the HIV seroconversion in female prostitutes was significantly associated with the occurrence of other non ulcerative STIs such as trichomoniasis.

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Bonne in 1836 first described *T. vaginalis* after observations of motile organism in human genital secretion which he considered as an aetiologic agent of vagintis (Thomason and Gilbert, 1989). *T. vaginalis* is the most widely studied parasite of all the *Trichomonas.* Physicochemical conditions do alter the appearance of the parasite. In axenic culture, the shape of the protozoan tends to be more uniform i.e. pear-shaped or oval (Arroyo *et al*., 1993), but the parasite takes a more amoeboid appearance when attached to vaginal epithelial cell (Arroyo *et al*., 1993). *T. vaginalis* is a flagellated protozoan possessing five flagella, four of which are located at its anterior position. The fifth flagellum is incorporated within the undulating membrane giving the parasite a characteristic quivering motility The nucleus in *T.vaginalis* is located at its anterior portion and as in other eukaryotes, it is surrounded by a porous nuclear envelop. Granules are commonly seen in living sample under light microscopy (Collier *et al*., 1999).

Humans are the only natural host for *T.vaginalis*. the trophozoite is transmitted from one person to another, usually by sexual intercourse. Trichomoniasis is seen much less frequently in the male and is associated with known infected female partner (Wilson and Acker, 1980). This study aimed at assessing the prevalence rate of *T. vaginalis* infection among pregnant women attending Sheikh Muhd Jidda General Hospital, Kano.

## Material and Methods

### Study Area

Sheikh Muhd Jidda General Hospital as a secondary health institution, with facility for antenatal care of expectant mothers. The hospital is located within Kano metropolis on Latitude $12^0$ 00N, and Longitude 8°30E, which is an urban closed-settle zone, is one of the oldest but growing and densely populated cities in Nigeria (Mukhtar *et al*., 2010). The hospital is patronized by clients and patients of moderate socio-economic group residing in the urban as well as in the suburban settlements in the metropolis.

### Target Group and Sample Size

The target group were 250 pregnant women attending Antenatal unit of the clinic. Their socio-demographic profiles were obtained accordingly. The sampling was a clustered type where all pregnant women on antenatal visit from August to October, 2008 were enrolled for the study. It includes both pregnant women that attend the antenatal clinic for routine examination and those that come due to pregnant-related illnesses. Consents were obtained from the sampled subjects after explaining the purpose and the sampling procedures to them.

### Mid-Stream Urine (MSU) and High Vaginal Swab (HVS) Samples Collection

A wide mouthed, leak-proof universal container was given to the subjects and was educated on how to collect an Early Morning, Mid-Stream Urine sample of 5ml into the container given to them. Bar code numbers were used to ensure anonymity of subjects and in order to facilitate both laboratory procedures and observance of Good Laboratory Practice. It was also used to minimise error during the handling of the urine specimens (Cheesebrough, 2003).

HVS sample was collected with the help of speculum, which was inserted and focused on the cervix where the sample was collected using sterile swab stick. 2ml of urine sample was put in a test tube and centrifuged at the rate of 1800 rpm for 3 minutes. It was then removed and the supernatant was decanted. The sediment was then kept ready for microscopy (Cheesebrough, 2003).

### Microscopy of MSU and HVS Samples

The urine sediment was smeared on a clean grease-free glass slide, covered with cover slips, which was then viewed under x10 and x40 objectives of the light binocular Olympus microscope to identify motile parasite of *T.vaginalis*. Smear of HVS was done after a 0.5ml of normal saline (physiological saline 0.9%) was placed unto a clean grease-free glass slide. The smear was then covered with a cover slip and observed under x10 and x40 objectives of the light binocular Olympus microscope to identify motile parasite of *T.vaginalis* (Cheesebrough, 2003).

**Statistical Analysis**

OpenEpi Version 2.2.1 was employed for the statistical analysis of the obtained data. Descriptive analysis include sum, percentage, mean and standard deviation, while analysis Null hypothesis was carried out using Chi-squared test in order to check whether there is significance difference between age groups, trimester and frequency of pregnancy to *T.vaginalis* infection.

## Result and Discussion

The socio-demographic characteristics obtained in this study on *T.vaginalis* infection prevalence among pregnant women showed that 14-20 years age group had the highest frequency distribution of 115 (46%) out of 250 sampled subjects, with the least distribution of 2 (0.8%) among the 41years-above age group (Table 1). Multigravidae had larger distribution as compared with the primigravidae subjects, 144 (57.6%) and 106 (42.4%) respectively (Table 1). The highest frequency distribution of 137 (54.8%) was recorded from subjects in the 3rd trimester of pregnancy, while least distribution was observed among the subjects at the 1st trimester, 34 (14%). 138 (55.4%) subjects reside in the urban settlement as compared with 112 (44.8%) that reside at the suburban areas (Table 1). Majority of the subjects sampled were unemployed 136 (54.4%) (Table 1).

**Table 1: Socio-demographic Characteristics of Pregnant Women Sampled.**

| Age group (years) | Freq. Preg | | Trimester First | Second | Third | Residence | | Empl. | | N | %Freq |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 14-24 | 86 | 29 | 20 | 32 | 63 | 58 | 57 | 71 | 44 | 115 | 46 |
| 25-30 | 20 | 85 | 15 | 35 | 55 | 62 | 43 | 43 | 62 | 105 | 42 |
| 31-40 | - | 28 | - | 10 | 18 | 16 | 12 | - | 28 | 28 | 11.2 |
| 41-above | - | 2 | - | 1 | 1 | 2 | - | - | 2 | 2 | 0.8 |
| N | 106 | 144 | 35 | 78 | 137 | 138 | 112 | 114 | 136 | | |
| % Freq | 42.4 | 57.6 | 14 | 31.2 | 54.8 | 55.2 | 44.8 | 45.6 | 54.4 | | |
| GT | | 250 | | | 250 | | | | 250 | 250 | 100 |

Key: GT= grand total; N= sum of figures in a row or column; Freq=frequency distribution; Empl= employment.

The result obtained in this study showed prevalence of 15 (6.0%) out of 250 subjects (Tables 2, and 3). This result was comparatively higher than what were obtained in the works of Aboyeji and Nwabuisi (2003) and that of Begum *et al.*(2006), 4.7% and 1.4% respectively. But is relatively low when compared with the study conducted in Mwanza, Tanzania among pregnant women, 16% (Mayaud *et al*., 1998). Subjects in the age group 31-40year of age have the highest prevalence 3 (10.7%) out of 28, with least prevalence of 4 (3.8%) out of 105 from the subjects in the 21-30 years of age (Table 2). Prevalence of *T.vaginalis* infection according frequency of pregnancy showed that multigravidae have relatively higher prevalence 10 (6.95%) out of 144 subjects (Table 3), while in terms of trimester, subjects belonging to 1st trimester have the highest prevalence of *T.vaginalis* infection, 3 (8.6%) out of 35, notwithstanding the fact that those in the 2nd and 3rd trimesters have relatively higher number of those with the infection, but their sample size was higher (Table 4). There was significant difference between age groups of pregnant women sampled [$X^2$= 176.895, at P≤0.05]; There was also significant difference between frequency of pregnancy [ $X^2$= 176.73, at P≤0.05]. Likewise there was significant difference between trimesters of pregnancy [$X^2$= 113.22, at P≤0.05]. It is evident that HVS proves to be a better sample collection procedure for detecting *T.vaginalis*; in which 15 (6.0%) of the sampled subjects were tested positive for presence of *T. vaginalis* when

using HVS method, while only 6 (2.4%) were tested positive in the case of MSU samples. This result proved the fact that *T.vaginalis* inhabits the cervix and is attached to vaginal epithelia (Arroyo *et al*., 1993). Statistical analysis showed clear significant difference between HVS & MSU based on Reliability [$X^2$= 120.5, at P≤0.05]. Although MSU is relatively easier to perform, since it is non invasive, the danger of FALSE result is enormous in both medical and health situation.

**Conclusion and Recommendations**

This study underscores the need for incorporating screening pregnant women at the antenatal clinic for *T.vaginalis* infection. This is relevant when its complications which include future infertility, premature rupture of the placental membrane, premature labour, Low Birth Weight (LBW) babies etc are taken into cognisance. The prevalence rate obtained in this study 6.0% although is relatively low, need to be taken seriously due to the nature of *T. vaginalis* mode of transmission (i.e. mostly through sexual intercourse or through toilet seats) which can rapidly spread the infection within a clustered population, of which Kano metropolis is aptly densely populated.

Table 2: Prevalence of *T. vaginalis* Infection among Pregnant Women according to Age Group.

| Age Group (Years) | No. Examined | No. Infected | % Prevalence |
|---|---|---|---|
| 14-20 | 115 | 8 | 6.96* |
| 21-30 | 105 | 4 | 3.8* |
| 31-40 | 28 | 3 | 10.7* |
| 41-above | 2 | - | - |
| Total | 250 | 15 | 6.00 |

*Significant difference: $X^2$=176.895 at P≤0.05.

Table 3: Prevalence of *T. vaginalis* Infection among Pregnant Women according to Frequency of Pregnancy.

| Frequency of Pregnancy | No. Examined | No. Infected | % Prevalence |
|---|---|---|---|
| Primigravida | 106 | 5 | 4.72* |
| Multigravida | 144 | 10 | 6.95* |
| Total | 250 | 15 | 6.00 |

*Significant difference: $X^2$=176.73 at P≤0.05.

Table 4: Prevalence of *T. vaginalis* Infection among Pregnant Women according to Trimester of Pregnancy.

| Trimester | No. Examined | No. Infected | % Prevalence |
|---|---|---|---|
| First | 35 | 3 | 8.6* |
| Second | 78 | 6 | 7.7* |
| Third | 137 | 6 | 4.4* |
| Total | 250 | 15 | 6.00 |

*Significant difference $X^2$=113.22 at P≤0.05.

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