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Trichomonas vaginalis Infection in a Typical Urban and a Suburban Area of Rivers State Nigeria

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Author's contribution

The sole author designed, analyzed and interpreted and prepared the manuscript.

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ABSTRACT

Aims: To assess *Trichomonas vaginalis* infection in a typical urban and a suburban area of Rivers state Nigeria.
Place and Duration: Three research and diagnostic laboratories in Port Harcourt and its environment between January 2014 and April 2016.
Methodology: High vaginal swab (HVS) was collected from a total of 1431 subjects and examined using a wet mount method after their consent was secured.
Results: The socio-demographic data showed that out of the total of 1431 persons examined 28.09 % (402/1431) were traders and that represents the highest group followed by students 27.17 % (389/1431) while civil servants were the least in the group 12.79 % (183/1431). Among the studied group, more subjects 38.23 % (547/1431) had secondary school education followed by subjects that had tertiary school education 26.00 % (372/1431) while subjects without formal education were the least with 10.55% (151/1431). The overall prevalence of 0.63 % (9/1431) was recorded in present study with more infections in the Revelations laboratories, Diobu (Urban) 0.77 % followed by Diagnostrix laboratories, Diobu (Urban) 0.59 % while the least infection was recorded at Reliable Diagnostics, Ozuoba (Suburban) 0.50 %. Incidentally, the first two laboratories were in the urban area while the last where the least infection was recorded, was in suburban area,

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showing no significant difference (p>0.05). Age Prevalence showed that subjects within 15-25 years had the highest prevalence of 0.92 % (4/433) followed by subjects within 26-35 years with 0.68 % (3/440) while the least prevalence of zero per cent was recorded among subjects within 46-55 years. More widows (1.10 %) were infected followed by single girls (0.68 %) while the least prevalence was recorded among the married (0.40 %).

Conclusion: The prevalence of *T.vaginalis* infection is low in Port Harcourt and environment and actually lower in the suburban area than the urban area. This low prevalence is suggestive of the fact that there is increased health awareness, improved personal hygiene, safer sex practices through the use of preventive measures, as a result of regular campaigns mounted to reduce HIV transmissions and other sexually transmissible diseases in Port Harcourt and surrounding environment.

Keywords: Infection; Trichomoniasis; urban; suburban; Rivers State; Nigeria.

1. INTRODUCTION

Trichomoniasis is reported to be the most common pathogenic protozoan infection of humans in industrialized countries, with an estimated 276.8 million infections acquired annually worldwide [1,2],out of which majority lives in developing countries [3]. It is said to be the most prevalent non-viral sexually transmissible infection (STI) in the world [4,5].

The infection is common in sexually active males and females, especially of child-bearing age [6]. Trichomoniasis is primarily transmitted through sexual contact, but horizontal transmission via contact with formites such as towels and clothing has been implicated [7]. *Trichomonas vaginalis* has been described as a common cosmopolitan parasite of both males and females. Trichomoniasis is an unpleasant disease that can go undiagnosed for years and is often transmitted by an asymptomatic carrier [6].Reports have implicated *T. vaginalis* in mild to severe infections such as upper reproductive tract post-surgical infections, pelvic inflammatory disease, reversible infertility, premature rupture of membranes, preterm labour, low birth weight, neonatal morbidity and mortality [8,9], tubal infertility and ectopic pregnancy [10].It is known to alters the acid/base balance of the vagina by reducing the acidity from between 3.8-4.2 to a basic pH 5.0-6.0 [11].

In Africa, the prevalence of trichomoniasis is reported to be very high [2]. O'Farrell et al,[12] reported 49.2 % in South Africa; Mirza et al, [13] reported 34 % in Nairobi, Kenya; Klouman et al.,[14] reported 24.7% in Tanzania. In Nigeria Usanga et al., [15] concluded that there is endemicity of *T. vaginalis* among pregnant women in Calabar, Nigeria when they recorded a prevalence of 5.2%. It was observed to be a public health problem in Onitsha as 17.5 % prevalence was recorded among women attending Hospital and Health centres in Onitsha in Anambra state [16]. Jatau et al., [17] reported 18.7 % in Zaria, Nigeria. Olorode et al., [18] reported 4.5 % among women in Port Harcourt. However, Wokem and Ndukwu [19] declared that *T. vaginalis* infection was on the increase after recording 10 % prevalence in their re-evaluation of vulvo-vaginal Trichomoniasis among women in Niger Delta region of Nigeria.

The majority of previous researchers based their reports on data obtained from tertiary and secondary health institutions. Many people are weary and reject medical care at that level due to procedures and protocols, which force them to move from one point to the other which is considered a process too demanding and torturous. Private laboratories provide primary health services and usually very convenient and accessible and so enjoy high patronage. The aim of this study was to assess prevalence of *T. vaginalis* infection in typical urban and sub urban areas of Rivers State using three different private laboratories.

2. MATERIALS AND METHODS

2.1 Study Area

Port Harcourt is the capital city of Rivers State, Nigeria. Rivers State lies on the coastal plain of the eastern Niger Delta. It has much surface water and high rainfall of between 3420 mm and 7300 mm per year. The land surface can be grouped into three main divisions: the fresh water, the mangrove swamp and the coastal sand ridges. Rainfall is seasonal, variable and heavy, generally Port Harcourt, south of latitude 05 °N, so rain occurs on the average every month of the year but with varying duration and

very short period of dry season. The mean annual temperature is in the range of 25 ℃ to 28 ℃ and relative humidity is high throughout the year. Port Harcourt has a population of 1.5 million [20]. Human traffic to Port Harcourt is high due to oil and gas activities.

2.2 Ethical Clearance

Ethical clearance was obtained from the Research management unit of the University of Port Harcourt and approval was sought and obtained from the management of the laboratories.

2.3 Sample Collection

The study was retrospective in nature and covered from January 2014 to April 2016. High vaginal swabs (HVS) were collected by inserting a sterile speculum into the posterior fornix of the vagina while the individual is in the lithotomic position. Sterile cotton wool swabs were aseptically inserted, swabbing the high area of the vagina after obtaining written consent from the patients. A total of 1431 women between ages 17 – 50 years in three private laboratories were screened. Two of laboratories were situated at the densely populated urban slump - Diobu area, located at 4‟47'24"N, 6° 59'36"E of Port Harcourt and one at the out sketch – Ozuoba (suburban) which is about 27 km from Port Harcourt with geographical coordinates 4° 52'44"N 6° 55'E.

2.4 Examination

A wet smear (wet mount) was made of each HVS, immediately after collection, in a drop of physiological saline on a clean glass slide covered with a cover slip and examined microscopically under the low power (10x) and high power (40x) magnifications for presence of motile quick jerky motion of the protozoa. Trichomonads are Pear-shaped, motile flagellates with characteristic spasmodic, wobbling and rotating motions.

A smear of the secretion was also made on a slide, air-dried and fixed in absolute methanol for 1 minute. Diluted Giemsa stain was poured on the smear and allowed to stain for 10 minutes after which it was washed, air dried and examined under microscope with oil immersion (X100) magnification for presence of trichomonads.

3. RESULTS

The socio-demographic data (Table 1) showed that out of the total of 1431 persons examined 28.09 % (402/1431) were traders and that represents the highest group followed by students 27.17 % (389/1431) while civil servants were the least in the group 12.79 % (183/1431). Among the studied group, more subjects 38.23 % (547/1431) had secondary school education followed by subjects that had tertiary school education 26.00 % (372/1431) while subjects without formal education were the least with 10.55 % (151/1431). The overall prevalence of 0.63 % (9/1431) was recorded in present study with more infections in the Revelations laboratories 0.77 % followed by Diagnostrix laboratories 0.59 % while the least infection was recorded at Reliable Diagnostics 0.50 % (Table 2). Incidentally, the first two laboratories were in the urban area while the last where the least infection was recorded was in suburban area. Though the difference in the prevalence according to the laboratory was not significant ($p>0.05$). Age distribution showed that subjects within 15-25 years had the highest prevalence of 0.92 % (4/433) followed by subjects within 26-35 years with 0.68 % (3/440) while the least prevalence of zero per cent was recorded among subjects within 46-55 years. More widows (1.10 %) were infected followed by single girls (0.68 %) while the least prevalence was recorded among the married (0.40 %) as shown in Table 4.

Table 1. Socio-demographic data of subjects examined for *T. vaginalis* in Port Harcourt area

Variable	No examined	Percentage (%)
Occupation		
Student	389	27.17
Trader	402	28.09
self employed	262	18.31
civil servant	183	12.79
Applicant	195	13.63
Age		
15-25	433	30.25
26-35	440	30.75
36-45	302	21.10
46-55	256	17.89
Level of education		
Primary	361	25.23
Secondary	547	38.23
Tertiary	372	26.00
No formal education	151	10.55

Table 2. Prevalence of *T. vaginalis* in the 3 laboratories in Port Harcourt area

Laboratory	No examined	No. positive	% positive
Diagnostix laboratories	843	5	0.59
Revelation laboratories	388	3	0.77
Reliable diagnostics	200	1	0.50
Total	**1431**	**9**	**0.63**

Table 3. Prevalence of *T. vaginalis* according to Age of subjects in Port Harcourt area

Age	No. examined	No. positive	% positive
15-25	433	4	0.92
26-35	440	3	0.68
36- 45	302	2	0.66
46-55	256	0	0.0
Total	**1431**	**9**	**0.63**

Table 4. Prevalence of *T. vaginalis* based on marital status of subjects in Port Harcourt Area

Marital status	No examined	No positive	% positive
Married	505	2	0.40
Single	739	5	0.68
Widow	187	2	1.10
Total	**1431**	**9**	**0.63**

4. DISCUSSION

The prevalence of 0.63 % recorded in the present study is low especially when compared with previous report by Olorode et al., [18] who reported 4.5 % among women in Port Harcourt and Wokem and Ndukwu [19] who recorded 10 % prevalence among women in Niger Delta region of Nigeria. More so, the fact that present investigation was from primary health facilities which are usually the first port of call when presented with health challenges due to ease of accessibility. This prevalence of 0.63 % is low and gives hope of possible elimination when compared with results from other part of Nigeria; Usanga et al., [15] who reported 5.2 % *T. vaginalis* among pregnant women in Calabar; Iwueze et al., [16] that recorded 17.5 % prevalence among women in Onitsha in Anambra state; Jatau et al.; [17] who reported 18.7 % prevalence in Zaria. Still greater hope when compared with reports from other African countries where T. *vaginalis* has been reported to be very high [2]. In South Africa, O'Farrell et al., [12] reported 49.2%; Mirza et al., [13] reported 34 % in Nairobi, Kenya; In Tanzania, Klouman et al., [14] reported 24.7%. This low prevalence may be incidental as a result of a pool of lightly infected population but it is suggestive of the fact that there is increased health awareness, improved personal hygiene, practise of safer sex through the use of preventive measures, as a result of regular campaigns mounted to reduce HIV transmissions and other sexually transmissible diseases in Port Harcourt and the surrounding environment.

Age-related prevalence showed that infection was highest (0.92 %) within the 15-25 years group. Similar observation was reported by Jatau et al., [17] who reported highest infections among age of 16-25 years and Usanga et al., [15] who recorded highest infection among age of 20-24 years. The reason for this observation may be that younger women are most likely to experiment with multiple sex partners and so may be more promiscuous than the older ones who out of experience may be more discreet and exercise restraint due to change in their body and life circumstances [21]. The prevalence decreased with increase of age to zero per cent among subjects 46-55 years. This seems to agree with general conception that sexual activity in women tends to decrease with increase in age [22].

More widows (1.10 %) were infected in this study than any other group on basis of marital status. This finding is at variance with Iwaeze et al., [16] who reported more infections among married women. *T. vaginalis* infection is closely tied to sexual promiscuity, ignorance, poor moral consciousness, poverty and the quest for more money. It may appear that these groups of

population who were used to good life before the demise of their partners may find it difficult to adjust and face the reality of having to fend for themselves and maybe children and therefore engage in promiscuous behaviour with multiple partners thereby exposing them to infection.

5. CONCLUSION

In conclusion, the prevalence of *T. vaginalis* infection is low in Port Harcourt and its surrounding environment and actually lower in the suburban area than the urban area. This low prevalence is suggestive of the fact that there is increased health awareness, improved personal hygiene, Practise of safer sex through the use of condoms and other preventive measures, as a result of regular campaigns mounted to reduce HIV transmissions and other sexually transmissible diseases in Port Harcourt and environment.

CONSENT

As per international standard or university standard, patient's written consent has been collected and preserved by the authors.

ETHICAL APPROVAL

As per international standard or university standard, written approval of Ethics committee has been collected and preserved by the authors.

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COMPETING INTERESTS

Author has declared that no competing interests exist.

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