ASSOCIATION BETWEEN RISK FACTORS AND TRICHOMONIASIS AMONG WOMEN IN PORT HARCOURT RIVERS STATE ,NIGERIA

Abstract

Historically, the presence of *T. vaginalis* has been viewed to be associated with certain risk factors. This study is focused as assessing the association between selected risk factors and trichomoniasis. The cross sectional study composed of 650 women,450 of them were tested for trichomonial infection using urine sample while the remaining 200 were tested for trichomonial infection using high vagina swab (HVS). These women were randomly selected among pregnant women, women with HIV, Out-patient, and healthy volunteer. After consenting to participate in the study, data concerning their exposure to selected risk factors were gathered through filled questionnaire. The results revealed that there was an association between "engaging in unprotected sex" and trichomoniasis ($p<0.05$). Similarly, the were associations between prevalence of trichomoniasis and "wearing air-tight underwear" ($p<0.05$), "repeating underwears" ($p<0.05$), "knowledge of trichomoniasis" ($p<0.05$) and "source of information" ($p<0.05$). This study has shown that engaging in unprotected sex, wearing air-tight underwear, repeating underwear, knowledge of trichomoniasis and source of infection are significant risk factors of trichomoniasis among women in RSUTH.

Keywords: *high vagina swab, T. vaginalis urine, trichomoniasis*

Introduction

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 [1] Infection with *T. vaginalis* is increasingly been recognized to be associated with reproductive tract complications including sepsis that occur after abortion and after Cesarean Section, as well as adverse pregnancy outcome. Trichomoniasis is the major problem in developing countries where parental testing and antibiotics use are not adequately available [2]

In women, the disease encompasses symptoms ranging from a severe inflammation and irritation with frothy malodorous discharge to a relatively asymptomatic carrier state. The outcome of infection with *Trichomonas* may be due to genetic variability of the isolates and the host immune response. The vagina is the most common site of infection in women. The parasite is sexually transmitted through penis-to-vagina intercourse or vulva-to-vulva (the genital area outside the vagina) contact with an infected partner [3] Women can acquire the disease from infected men

or women, but men usually contract it only from infected women. Pregnant women with trichomoniasis may have babies who are born early or with low birth weight (low birth weight is less than 5.5 pounds). [2,9] Prevention of trichomoniasis has not been a priority due to lack of understanding of its public health implications and lack of resources. For long it has been considered a 'minor' STD. [3]

Trichomonas vaginalis is the most common Sexually Transmitted Parasitic Diseases (STPDs) in Nigeria[4;5]but had neither been the focus of intensive study nor of active control program and the negligence is as a result of relatively mild symptoms of the disease on initial exposure especially in African descent. Therefore, the study was aimed at assessing the association of trichomoniasis and selected risk factors in urine HVS of women attending RSUTH.

Materials and Methods

Study Design

A descriptive cross sectional study was adopted and 650 participants[6]were randomly selected [7]from females within the age of 15 and 55 years attending Rivers State University Teaching Hospital (RSUTH), Port Harcourt, Nigeria. The participants were selected among pregnant women, HIV patients, out patients and healthy volunteers. Out of the 650 participants, 450 were tested for trichomoniasis using urine while 200 participants were tested using high vagina swab (HVS). Data pertaining possible risk factors were obtained via well-structured questionnaire supported by verbal interview[8].

Ethical Consideration

Ethical approval was sought and obtained from Rivers State University Teaching Hospital (RSUTH) and informed written consent was obtained from each participant before their enrolment in the study.

Eligibility Criteria

Inclusion Criteria

Only subjects who gave informed and written consent were included in the study. Females within the reproductive age of 15-55 years of age and those who were sexually active were enrolled.

Exclusion Criteria

Females who were not within the reproductive age of 15-55 years and females did not give written consent were not recruited. Females who were not registered with RSUTH were also not selected.

Sample Collection and Analysis

A total of 200 High vaginal swab (HVS) specimen using sterile cotton swab sticks were aseptically collected from consented participants across the study area by qualified female medical laboratory scientists and 450 urine specimens were collected by the patients themselves using clean sterile sample bottles as directed. The HVS and urine samples were moved to the laboratory for microscopic smear examination for the trophozoites of *T. vaginalis.* Prior to smear preparation, the samples were cultured using *T. vaginalis* medium[6,9]

Statistical Analysis

Data obtained was entered into Microsoft Excel and analyzed using SPSS version 25. Descriptive statistics including frequencies and percentages were used to describe the population and also to estimate the prevalence of trichomoniasis in the studied population. Chi-square test was used to investigate associations among categorical variables. Confidence level was set at 95%.

Results

Table 1 shows the association between awareness and trichomoniasis among women attending RSUTH. The results presents that there is a significant association ($p<0.05$) between knowledge of trichomoniasis and trichomonial infection. Similarly, there was a significant association ($p<0.05$) between source of information and trichomoniasis among women attending RSUTH. There is no relation ($p>0.05$) between knowledge of STI and trichomoniasis.

Table 2 shows the association between personal hygiene and trichomoniasis among women attending RSUTH. The results presents that there is a significant association ($p<0.05$) between wearing air-tight underwear and trichomonial infection. Similarly, there was a significant association ($p<0.05$) between repeating underwear and trichomoniasis among women attending RSUTH. There was no association ($p>0.05$) between the infection and other studied personal hygiene practices (hand washing, vagina washing, vagina washing method and clean after urination).

Table 3 shows the association between lifestyle and trichomoniasis among women attending RSUTH. The results presents that there is a significant association ($p<0.05$) between engaging with unprotected sex and trichomonial infection. There was no association ($p>0.05$) between the infection and other studied lifestyle (sexual activeness, protection use, number sexual partners, STI screening on partners and STI screening on self).

Table 1.0: Prevalence of Trichomoniasis based on Awareness among the study population

Awareness	Responses	NE		NP (%)								x^2		P-value	
				OP		HIV		PTW		HV					
		Urine	HVS	Urine	HVS	Urine	HVS	Urine	HVS	Urine	HVS	Urine	HVS	Urine	HVS
Knowledge of Trichomoniasis	No	294	113	4(1.4)	4(3.5)	12(4.1)	8(7)	3(1)	2(1.8)	0(0)	0(0)	4.620	8.796	0.099	0.012
	Yes	144	85	2(1.4)	3(3.5)	1(0.7)	0(0)	0(0)	0(0)	0(0)	0(0)				
	I don't know	12	2	0(0)	1(50)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)				
Knowledge of STI	No	46	13	1(2.2)	1(7.7)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0.812	0.029	0.367	0.865
	Yes	404	187	5(1.2)	7(3.7)	13(3.2)	8(4.3)	3(0.7)	2(1.1)	0(0)	0(0)				
Source of Information	Media	9	6	0(0)	2(33.3)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	5.438	12.701	0.245	0.005
	HCP	59	27	2(3.4)	1(3.7)	1(1.7)	0(0)	0(0)	0(0)	0(0)	0(0)				
	Books	74	52	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)				
	Fam/friends	1	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)				
	I don't know	307	115	4(1.3)	5(4.3)	12(3.9)	8(7)	3(1)	2(1.7)	0(0)	0(0)				

NE = Number Examined; NP = Number Positive; HVS = High Vaginal Swab; OP = Out Patients; HIV = HIV Positive Persons; PTW = Pregnant Women; HV = Healthy Volunteers. ($P<0.05$).

Table 2.0: Prevalence of Trichomoniasis based on Personal Hygiene among the study population

Personal Hygiene	Responses	NE		NP (%)											
				OP		HIV		PTW		HV		x^2		P-value	
		Urine	HVS	Urine	HVS	Urine	HVS	Urine	HVS	Urine	HVS	Urine	HVS	Urine	HVS
Hand washing	Regularly	373	164	5(1.3)	7(4.3)	9(2.4)	4(2.4)	3(0.8)	2(1.2)	0(0)	0(0)				
Practice	Occasionally	76	36	1(1.3)	1(1.3)	4(5.3)	4(5.3)	0(0)	0(0)	0(0)	0(0)	0.606	1.281	0.738	0.258
	Rarely	1	0	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)				
Vaginal washing	Regularly	383	176	6(1.6)	8(4.5)	10(2.6)	6(3.4)	2(0.5)	0(0)	0(0)	0(0)				
	Occasionally	67	24	0(0)	0(0)	3(4.5)	2(8.3)	1(1.5)	2(8.3)	0(0)	0(0)	0.198	1.957	0.656	0.162
	Rarely	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)				
Vaginal wash	Water	436	200	6(1.4)	8(4)	13(3)	8(4)	3(0.7)	2(1)	0(0)	0(0)	0.743	NIL	0.389	NIL
Method	Soaps	14	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)				
Clean after	Regularly	344	176	4(1.2)	8(4.6)	8(2.3)	6(3.4)	3(0.9)	2(1.1)	0(0)	0(0)				
Urination	Occasionally	95	24	2(2.1)	0(0)	5(5.3)	2(8.3)	0(0)	0(0)	0(0)	0(0)	2.028	0.015	0.363	0.903
	Rarely	11	0	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)				
Wearing air-tight	Regularly	97	41	2(2.1)	4(9.6)	5(5.2)	4(9.6)	0(0)	0(0)	0(0)	0(0)				
Underwear	Occasionally	187	74	2(1.1))	3(4.1)	5(2.7)	2(2.7)	2(1.1)	2(2.7)	0(0)	0(0)	1.712	8.657	0.425	0.013
	Rarely	166	85	2(1.2)	1(1.2)	3(1.8)	2(2.4)	1(0.6)	0(0)	0(0)	0(0)				
Repeating	Regularly	23	10	0	1(10)	4(17.4)	0(0)	0(0)	0(0)	0(0)	0(0)				
Underwear	Occasionally	120	41	2(1.7)	5(12.2)	3(2.5)	0(0)	1(0.8)	2(4.9)	0(0)	0(0)	8.369	4.228	0.015	0.121
	Rarely	307	149	4(1.3)	2(1.3)	6(2)	8(5.4)	2(0.7)	0(0)	0(0)	0(0)				

NE = Number Examined; NP = Number Positive; HVS = High Vaginal Swab; OP = Out Patients; HIV = HIV Positive Persons; PTW = Pregnant Women; HV = Healthy Volunteers. ($P<0.05$).

Table 3.0. Prevalence of Trichomoniasis based on Lifestyle among the study population

Lifestyle	Responses	NE		NP (%)											
				OP		HIV		PTW		HV		x^2		P-value	
		Urine	HVS	Urine	HVS	Urine	HVS	Urine	HVS	Urine	HVS	Urine	HVS	Urine	HVS
Sexually active	No	57	14	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	3.355	1.489	0.067	0.222
	Yes	393	186	6(1.5)	8(4.3)	13(3.3)	8(4.3)	3(0.8)	2(1.1)	0(0)	0(0)				
Engage in unprotected sex	Regularly	229	93	1(0.4)	5(5.4)	7(3.1)	6(6.5)	3(1.3)	2(2.2)	0(0)	0(0)				
	Occasionally	83	48	2(2.4)	3(6.3)	5(6)	0(0)	0(0)	0(0)	0(0)	0(0)	5.642	7.22	0.13	0.027
	Rarely	73	46	3(4.1)	0(0)	1(1.4)	2(4.4)	0(0)	0(0)	0(0)	0(0)				
	N/A	65	13	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)				
Protection Used	Condoms	127	80	3(2.4)	3(3.8)	6(4.7)	2(2.5)	0(0)	0(0)	0(0)	0(0)				
	Medication	25	17	1(4)	2(11.8)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	1.838	1.252	0.399	0.535
	N/A	298	103	2(0.7)	3(2.9)	7(2.3)	6(5.8)	3(1)	2(1.9)	0(0)	0(0)				
Number of sexual	1	374	176	6(1.6)	8(4.6)	13(3.5)	8(4.6)	3(0.8)	2(1.1)	0(0)	0(0)				
Partners	2	7	5	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	4.7	0.095	2.697	0.26
	N/A	69	19	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)				
STI Screening on	No	307	129	4(1.3)	6(4.7)	11(3.6)	6(4.7)	3(1)	2(1.6)	0(0)	0(0)				
Partners	Yes	53	50	1(1.9)	2(4)	2(3.8)	2(4)	0(0)	0(0)	0(0)	0(0)	3.457	2.679	0.178	0.262
	N/A	90	21	1(1.1)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)				
STI Screening on self	Regularly	43	39	1(2.3)	2(5.1)	1(2.3)	0(0)	0(0)	0(0)	0(0)	0(0)				
	Occasionally	104	52	0(0)	0(0)	6(5.8)	4(7.7)	1(1)	2(3.8)	0(0)	0(0)	0.933	1.163	0.627	0.559
	Rarely	277	99	4(1.4)	6(6.1)	6(2.2)	4(4)	2(0.7)	0(0)	0(0)	0(0)				
	N/A	26	10	1(3.4)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)				

NE = Number Examined; NP = Number Positive; HVS = High Vaginal Swab; OP = Out Patients; HIV = HIV Positive Persons; PTW = Pregnant Women; HV = Healthy volunteer. ($P<0.05$)

Discussion

Trichomoniasis is an unpleasant parasitic infection that can go undiagnosed for years and is mainly transmitted by asymptomatic carriers. The prevalence of *T. vaginalis* infection, co-infection with bacterial infection, bacterial vaginosis other sexually transmitted infections (HIV) and attendant high risk of adverse pregnancy outcomes, pelvic inflammatory diseases, and tubal infertility make trichomoniasis an infection of compelling public health concern [2,10].

The study showed that lack of awareness of *Trichomonas vaginalis* is a risk factor contributing to the spread of the disease as a prevalence rate of 50% (P=0.012) was recorded among subjects who have no knowledge of trichomoniasis. There was also an association between source of information and trichomoniasis among the women. This implies that both knowledge of trichomoniasis and source of information are notable risk factors for trichomonial infection. Women who wear tight underwear and repeat underwear recorded a high prevalence rate of 9.6% (P=0.013) for HVS 17% (P=0.015) for urine specimen. Subjects who clean the vulva after urinating occasionally recorded a prevalence of 8.3% but is not statistically significant (P>0.05). These findings are in agreement with study recorded byAmadi and Nwagbo (2013) where high prevalence was observed among women who did not clean after urinating, wear damp underwear, and tight underwear which irritates the vaginal and upsets bacterial balance predisposing women to trichomoniasis.[11] Hand washing practice and vagina washing is not closely associated with trichomoniasis infection. The prevalence of trichomoniasis among females who are not sexually active was low (0%) which implies that there negligible tendencies for women who are not sexually active to get infected with *Triochomona vaginalis*, therefore, it is not considered as a risk factor for the infection. This study recorded high prevalence among subjects who engage in unprotected sex regularly (6.5%) and a significant (P=0.027) association with the infection. This implies that unprotected sex is a notable risk factor for trichomoniasis among women.This study agrees with Crucitti *et al.,* (2011) that multiple sexual partners and lifestyle are determinants of trichomoniasis infection.[12]Prevalence of subjects who used medications as preventive measure during sexual intercourse was (11.8%), those who had one sexual partner was (4.6%), those who do not carry out STI screening on their partners was (4.7%) and those screenning themselves occasionally was (7.7%). There was no significant association between those risk factors and trichomoniasis. It is however a concern that self-reported data on sexual behaviour are usually not reliable which may in-turn affect the outcome and decision of such study.

Conclusion

This work has demonstrated that amongst selected possible risk factors studied, engaging in unprotected sex, wearing air-tight underwear, repeating underwears, knowledge of trichomoniasis and source of information were identifiable significant risk factors for trichomonial infection among women attending RSUTH.

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