

PREVALENCE OF *Trichomonas vaginalis* AND *Schistosoma haematobium* INFECTIONS IN BAUCHI METROPOLIS, NORTHERN NIGERIA

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ABSTRACT

A cross section of subjects attending five (5) medical centres in Bauchi metropolis were surveyed for the presence of parasites in their urine samples. The result obtained indicated that 22 (7.72%) out of 284 samples examined were found to be positive with *T. vaginalis*, while 58 (20.4%) had *S. haematobium* infection. Overall there was prevalence of 142 (50.1%) out of 284 subjects, with highest prevalence of 78 (55.7%) out of 140 male subjects. Paediatric subjects were observed to have higher prevalence of parasitic infections of 40 (74.1%) out of 54 subjects. The overall risk and risk ratio of 66.67% and 1.206 respectively showed no significant difference between age group, likewise overall risk and risk ratio of 66.67% and 0.9276 showed no significant difference between the sexes at $P < 0.05$. This study underscores the need for enforcement of personal hygiene especially in the children so as to curtail the potential complications of such infections.

KEYWORDS: parasitic infections, prevalence, *S. Haematobium*, *T. vaginalis*,

INTRODUCTION

Parasites are defined as organisms with detrimental effect on the intrinsic growth rate of their host population (Otubanjo, 2010). Urinary tract is among the human body cavities that is infected with parasites more especially *Trichomonas vaginalis* and *Schistosoma haematobium*. *T. vaginalis* is often confused with yeast infection due to their symptomatic characteristics including purulent vaginal discharge, vaginitis, odorous smell, pruritis, etc. (Collier et al., 1998).

Schistosomiasis or bilharziasis is a disease of warm tropical countries. *Schistosoma* is a parasitic digenetic trematode worm of the Superfamily Schistosomatidea (Collier et al., 1998). Schistosomiasis is the second most prevalent infection after malaria affecting Daily Adjusted Life Years (DALYs) of the infected persons. The digenetic trematode worms infect 200 million people, with 800 million at risk of infection. 20 million suffer from severe consequences of this chronic disease which is responsible for an estimated 300, 000 deaths per year (Collier et al., 1998).

Oviposition in the lower urinary tract remains as the main pathogenic feature of *S. haematobium* infection. Schistosomiasis is endemic in Nigeria and estimated 3million Nigerian children aged between 9 and 14 years are infected. Study on urinary schistosomiasis in nine communities of Ohaji/Egbeme Local government area of Imo state reported a prevalence of 11.3% with the males having a higher rate than the females. About 80% of all the infected persons were within the 1-40 year age bracket. Schistosomiasis is endemic in Ondo State, where it is a public health problem with the prevalence in all 18 local

government areas falling between 41-95% (Odaibo et al., 2004).

Schistosomiasis has been reported in many parts of Nigeria with varying intensities and prevalence (Ugbomoiko, 2000; Dunah and Brisbane, 2000).

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. Bonne in 1836 first described *T. vaginalis* after observation of motile organism in human genital secretion which are considered as an aetiologic agent of vaginitis. *T. vaginalis* is a flagellated protozoan possessing five flagella, four of which are located at its anterior position, granules are commonly seen in living sample under light microscopy (Collier et al., 1998). *T. vaginalis* is commonly isolated in the female urethra due to ascending infection as a result of close proximity with the vaginal orifice. Trichomoniasis is seen much less infrequently in male and is associated with known infected female partner (Wilson and Acker, 1980).

The work of Imam et al. (2010) shows that *T. vaginalis* infection can be easily detected by observing mid-stream urine of the female subject, which implies that the slightly low pH in the bladder is amenable to its habitation since it is comfortable with living in a lower pH environment (i.e. the vaginal orifice and cervix). Linked to *T. vaginalis* infection are cervical cancer, tropical pelvic inflammatory diseases (PID) and infertility.

As with other STIs, *T. vaginalis* infection can augment the predisposition of individuals to Human Immunodeficiency Virus (HIV) infection (Kulda et al., 1993). Laga et al. (1991) found that the HIV seroconversion in female prostitute was significantly associated with the occurrence of other non-ulcerative STIs such as trichomoniasis. This work aimed at studying the prevalence of *Trichomonas vaginalis* and *Schistosoma haematobium* infections in the urine samples across Bauchi Metropolis, Northern Nigeria.

MATERIALS AND METHODS

Study Area and Sample Collection Sites

Bauchi metropolis (formerly called Yakoba) is a moderately densely populated city, which is a capital of Bauchi State established in 1976 by the then military administration. It is situated on Latitude 10° 18'N and Longitude 9° 50' E at an altitude of over 500m. It is located on the northeastern edge of the Jos plateau. Five urine sample collection sites were selected based on their strategic locations which cut across the metropolis according to patient/client attendance. These include: Bayara Hospital, Bauchi Specialist Hospital, Alheri Clinic, Mai Jama'a Clinic and Lisa Laboratory.

Target group and sample size

Three hundred and forty five (345) adult patients and eighty one (81) paediatric patients were the target groups, with the total of four hundred and twenty six (426) sample size. The sample size was above the computed three hundred and eighty four (384) at 95% confidence interval using OpenEpi 2.3 software (Dean et al., 2009).

The sampling cut across both sexes (i.e. males and females) and age. Appropriate consent was obtained from the subjects explaining the purpose and procedure of sample collection with the assistance of the laboratory personnel with full co-operation of the hospitals authorities concerned.

Mid-Stream Urine Sample Collection

A wide mouthed, leak-proof universal container was given to the subjects and were educated on how to collect an early morning, mid stream urine (MSU) sample of 5 ml into the container provided to them. Code numbers were used in the labeling of the samples in order to ensure anonymity of subjects and to facilitate both laboratory procedures and observance of good laboratory practices, and also in order to minimize error during handling of the urine specimens. Two milliliters of urine sample was poured in a test tube and centrifuged at 36.2g for 3minutes. It was then removed and the supernatant was decanted. The sediment was then kept ready for microscopy (Ochei and Kolhatkar, 2007).

Microscopy of Mid-Stream Urine (MSU)

The sediment was smeared unto a clean grease-free glass slide, covered with cover slips and then

viewed under x 10 and x 40 objectives of the electric light binocular microscope to identify trophozoites of *T. vaginalis* and ova of *S. haematobium* (Ochei and Kolhatkar, 2007).

Statistical Analysis

OpenEpi version 2.3 open source epidemiologic statistics for public health was utilized in computing overall risk, risk ratio and chi-squared test to check for significant difference between the obtained variables at P<0.05.

RESULTS AND DISCUSSION

The results obtained in this study showed frequency distribution of urine sampling from the collection sites: Bayara hospital with 120 (28%), Bauchi specialist hospital, 111 (26%), Alheri clinic, 60 (14%), Maijama'a clinic, 64 (15%) and Lisa laboratory, 74 (17%) (Table 1).

Age-specific prevalence of parasitic infections with the two parasites showed that paediatric patients (≤ 12 years) had higher rate than the adults (> 12 years), with 60 (74.1%) and 153 (44.4%) respectively (Table 2). Overall risk of 66.67% and Risk ration of 1.206 indicate that there is relatively higher risk of parasitic infections among the subjects, but there was no significant different between subject based on age group at P<0.05 (Table 2).

Table 3 illustrates sex-specific prevalence of the parasitic infection which shows higher prevalence of 117 (55.7%) among the male subjects, with overall risk and risk ratio of 66.67% and 0.9276 respectively, there is moderate to high risk of parasitic infection among the sexes, although risk ratio is moderate in intensity, there was no significant difference between sexes at P<0.05.

Distribution of infection with the parasites across Bauchi metropolis showed *T. vaginalis* infection has higher prevalence, 84 (39.44%) (Table 4). It is noteworthy that *T. vaginalis* infection is confined to female subjects as shown in the current work. The result is in congruence with the observation of Wilson and Acker (1980) where trichomoniasis is seen much less frequently in male. The result is higher than those obtained in the works of Imam et al. (2009) and Imam et al. (2010) which were survey of pregnant women conducted in Kano metropolis. While *S. haematobium* infection was predominantly higher in among the male subjects with 55.7% prevalence (Table 4). This result is in agreement with the works of Odaibo et al. (2004), Sulayman et al. (200), Oniya and Olofintoye (2009) which showed higher prevalence of schistosomiasis among the males. This discrepancy in the prevalence rate of schistosomiasis between males and females could be due to the higher exposure to risk by the males because of their contact with the snail intermediate host (*Bulinus* sp.) more than their female counterparts (Sulayman et al., 2009; Abdullahi et al., 2010; Gyang, 2010; Nanvyat et al., 2010; Adeyemi and Aiseien, 2010; Amuta et al., 2010).

Overall prevalence of parasitic infection with the parasites was 213 (50%) out of 426 subjects (Tables 2, 3 and 4). There was significant difference based on distribution of parasitic infections at $P < 0.05$.

Table 1: Urine Samples Collection Centers and Percent Distribution across Bauchi Metropolis, Nigeria.

Collection Centers	Adult(>12 years)		Paediatrics (≤12 years)		Total
	Male	Female	Male	Female	
Bayara Hospital	45	54	9	12	120(28.2)
Specialist Hospital	36	48	12	15	111(26)
Alheri Clinic	27	33	-	-	60(14.1)
Mai Jama'a Clinic	28	24	12	-	64(16.9)
Lisa Laboratory	32	18	12	12	74(14.8)
Total	168(39.4)	177(41.6)	42(9.9)	39(9.2)	426(100)

NB: Numbers in parentheses are percent distribution.

Table 2: Age-specific Prevalence of Infections with *T. vaginalis* and *S. haematobium* in Urine Samples across Bauchi Metropolis, Nigeria.

Subject	No. Examined	No. Infected	% Prevalence
Adult (> 12years)	345	153	44.4*
Paediatrics (≤ 12years)	81	60	74.1*
Total	426	213	50.0*

*Overall Risk= 66.67%, Risk Ratio= 1.206 at $P \leq 0.05$

Table 3: Sex-specific Prevalence of Infections with *T. vaginalis* and *S. haematobium* Bauchi Metropolis, Nigeria.

Subject	No. Examined	No. Infected	% Prevalence
Male	210	117	55.7*
Female	216	96	44.4*
Total	426	213	50.0*

*Overall Risk= 66.67%, Risk Ratio= 0.9276 at $P \leq 0.05$

Table 4: Distribution of Parasitic Infections in Urine Samples across Bauchi Metropolis, Nigeria.

Parasite	Adult(>12years)		Paediatrics (≤ 12years)		Total
	Male	Female	Male	Female	
<i>Trichomonas vaginalis</i>	0(0)	66(95.65)	0(0)	18(66.67)	84(39.44)*
<i>Schistosoma haematobium</i>	84(100)	3(4.35)	33(100)	9(33.33)	129(60.56)*
Total	84(39.4)	69(32.4)	33(15.5)	27(12.7)	213(50.0)*

Numbers in parentheses are percent distribution.

*There was significant difference $\{X^2=104.1, df=6\}$ at $P \leq 0.05$.

CONCLUSION AND RECOMMENDATIONS

Prevalence of parasitic infections in the urine samples of males and females subjects across Bauchi metropolis showed a seriously high trend, with 213 (50%). The study showed higher prevalence among the male than in the female subjects. Likewise paediatric subjects had higher prevalence than the adults.

T. vaginalis showed a predilection to female urinary tract due to close proximity of their

urethra with the vaginal orifice, while *S. haematobium* was relatively higher among the male subjects because of their exposure to risk by coming in contact with the intermediate host. The study underscores the need for improved personal hygiene and health education of the populace by the government as well as non-governmental organizations.

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