Urino – genital trichomoniasis and Human Immuno – Deficiency Virus concurrent infection in Adamawa State, Nigeria

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Citation

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Abstract

Opportunistic infections are some of the critical complications precipitating the progression of HIV infection to AIDS. This study was therefore focused on assessing the rate of co-infection between urino-genital trichomoniasis and HIV in Adamawa State Nigeria. The study was conducted on 1520 subjects aged 15-64 years randomly selected from 15 healths institutions in the state. Ethical approval was obtained from the state ministry of health and the authorities of the selected health institutions while the research also had the informed consent of the subjects before specimen collection. Culture method was employed for Trichomonas vaginalis detection and commercial HIV kits were used for HIV antibody testing. Questionnaire was administered to the subjects for some demographic information. A concurrent infection rate of 1.1% was recorded in the study but statistical analysis showed no significant variation in the infection rate by geographical zone of the study area ($P > 0.05$). However Chi-square analysis showed a significant difference between the prevalence of infection by age ($P < 0.05$) and by gender ($P < 0.05$). Similarly, prevalence co- of concurrent infection in relation to marital status showed no significant difference ($P > 0.05$) and also no significant difference in the infection rate according to occupation ($P > 0.005$).

INTRODUCTION

As at 2005, over 43 million people had been infected with HIV globally, while about 25 million had died of AIDS. Out of these, 70% were recorded from sub-Saharan Africa ([1]). Although there are many factors that can influence the progression of HIV infection to AIDS, complications emanating from infections are some of the critical ones. With the increasing evidence, sexually transmitted infections may soon assume a status of serious public health problem in view of their growing association and interaction with the dreaded virus ([2]). By definition, sexually transmitted infections are infections that are mainly transmitted through intimate sexual activities.

World Health Organization ([3]) reported that over 25 microorganisms can be transmitted sexually, but not all are common. Among the common ones are Human Immunodeficiency Virus (HIV) and Trichomonas vaginalis. Previous studies had documented an association between the two micro organisms. For instance, it was reported in a study that Trichomonas vaginalis is one of the sexually transmitted micro organisms that can be transmitted concurrently in HIV/AIDS patients ([4]). In another research finding, it was documented that both microorganisms have the ability to produce heamorrhage, oedema and ulteration of the vagina ([5]).

Also, several studies had documented ([6], [7], [8]) that both ulcerative and non-ulcerative sexually transmitted infections can increase the risk of HIV transmission. Because of a common mode of transmission, HIV interacts with other sexually transmitted infections in many ways. In non-ulterative infections like urino-genital trichomoniasis, the discharge produced can carry high density of HIV particles and high viral load in genital fluid thereby increasing the chances of HIV particles and high chances of HIV infection per exposure. In a study conducted in Central Africa Republic among some antenatal women, 9.9% vaginal trichomoniasis and 12.2% HIV-1 infection rates were documented ([9]), while 14.0% trichomoniasis and 52% HIV prevalence rates were reported ([10]) in a similar research carried out among some randomly selected married Zambia. Similarly, a research conducted among some randomly selected married women in a sub-urban Sudanese community, showed no case of urino-genital trichomoniasis while 1.2% prevalence rate of HIV infection was recorded

([11]). In Adamawa state Nigeria, a study conducted on female's subjects in Yola metropolis revealed 4.0% prevalence rate of vaginal trichomoniasis and 9.6% of HIV infection ([12]).

The aim of this study therefore is to conduct a comparative assessment on the prevalence rates of the two infections in Adamawa state, Nigeria, hence determine the prevalence of concurrent infection by the organisms.

SUBJECTS AND METHODS

STUDY POPULATION

The study was conducted between January 2006 and October 2007 on 1520 subjects aged 15-64 years randomly selected from some health institutions in Adamawa state, Nigeria. The subjects consisted of apparently healthy males and females, antenatal women and sick males and females without any previous history of trichomoniasis or HIV infection. Prior to the commencement of sample collection, the study received the approval of the State Ministry of Health and Health Services Management Board, the authorities responsible for the regulation of all the health institutions in the state. Ethical approval was also obtained from the authorities of the selected health institutions while the informed consent of the subject, was sought. Pre-test and post-test result counseling was given to all participants in the study.

SPECIMEN COLLECTION, PROCESSING AND LABORATORY ANALYSIS.

Two and half milliliters of venous blood and a genital swab were collected from each of the selected subjects. Also, for some demographic information about the age, sex, marital status and occupation of the subjects, a structured questionnaire was administered to every subject sampled and where this is not helpful in - depth interview was used as an alternative. The blood specimens were collected in clean test tubes, held at room temperature to clot before centrifuging to separate the sera. The sera were run serologically on daily basis for HIV antibodies. Commercial Capillus (Trinity-Biotech, Japan) and Standard Diagnostic (Bioline, United Kingdom) HIV Kits were employed and manufacturers' procedures were followed. Positive and negative control sera were included in the typing to ascertain the reliability of the screening kits. Only sera reactive by Capillus screening were further classified into HIV sero-types with Standard Diagnostics kit. The genital swabs were collected aseptically and inoculated immediately into an enriched culture medium for Trichomonas vaginalis identification. Culture Method described by Oyerunde ([13]) was modified by substituting the horse serum with bovine serum before used for the present study. Turbid appearance of the culture after incubation indicated the presence of the parasite.

Data obtained were analyzed statistically using Chi-square, Analysis of variance and correlation and regression statistical tools.

RESULTS

Table 1 shows the prevalence of co-infection among the study population. Of the 16 (1.1%) concurrent infection recorded , 9 (1.2%) was recorded in the central zone, 6(1.2%) in the northern zone while 1 (0.04%) was recorded in the southern zone area. Statistical analysis by ANOVA showed no significant variation in the prevalence of concurrent infection by geographical zone of the study area

($P > 0.05$). However, by applying correlation and regression analysis, a positive linear association was obtained ($r = 0.9266$) between the microorganisms.

Figure 1

Table 1: Concurrent infection between urino-genital trichomoniasis and HIV infection in Adamawa state.

Geographical Zone	Number Examined	SINGLE INFECTION (%) T.V	HIV	Concurrent infection (%)
North	491	14 (2.9)	48 (9.8)	6 (1.2)
South	251	6 (2.4)	19 (7.6)	1 (0.04)
Central	778	19 (2.4)	124 (15.9)	9 (1.2)
Total	**1520**	**39 (2.6)**	**191 (12.6)**	**16 (1.1)**

The frequency of co-infection between HIV and Trichomonas vaginalis in relation to age and gender is as shown in table 2. Of the 1520 subjects examined, 8(0.52%) co-infection was recorded among the subjects within 15-24 years age-group, 6(0.40%) within 35-44 years 1(0.06%) each within 25-34 years and 55-64 years age bracket while no concurrent infection was recorded 45-54 years age-group. Statistical analysis by Chi-Square shows a significant difference between the prevalence of co-infection by age ($p< 0.05$) Assessing the frequency of co-infection by gender, out of the overall 16(1.1%) recorded in the study, 13 (0.9%) was recorded among females while 3(0.2%) was recorded among their male counter parts. Statistical analysis also showed a significant difference in the distribution of concurrent infection by sex, ($P < 0.05$).

Figure 2

Table 2: Prevalence of co-infection between and HIV by age gender.

Age group (Years)	Prevalence (%) of: T.V	HIV	Co-infection
15-24	17 (1.11)	50 (3.3)	8 (0.52)
25-34	6 (0.39)	52 (3.42)	1 (0.06)
35-44	8 (0.52)	35 (2.3)	6 (0.39)
45-54	3 (0.19)	23 (1.5)	0 (0.0)
55-64	5 (0.33)	31 (0.26)	1 (0.06)
Total	**39 (2.6)**	**191 (12.6)**	**16 (1.1)**
Sex			
Male	6 (0.40)	56 (3.7)	3 (0.20)
Female	33 (2.20)	135 (8.9)	13 (0.90)

The distribution of concurrent infection in relation to marital status is as indicated in table 3. Of the 87 single infected, 3(0.19%) co-infection was recorded among them while 4(0.26%) concurrent infection, was recorded out of the 61 infected married subjects and 9(0.59%) out of 82 infected divorced subjects. Statistical analysis however showed that prevalence of the co-infection did not vary significantly among single, married and divorced subject, ($P > 0.005$).

Figure 3

Table 3: Distribution of concurrent infection between urino-genital Trichomoniasis and HIV in relation to marital status.

Marital Status	Number infected	Prevalence (%) of: T.V	HIV	Co-infection
Single	87	7 (0.46)	80 (5.26)	3 (0.19)
Married	61	11 (0.72)	50 (3.28)	4 (0.26)
Divorced	82	21 (1.38)	61 (4.01)	9 (0.59)
Total	**230**	**39 (2.6)**	**191 (12.6)**	**16 (1.1)**

Table 4 shows the prevalence of concurrent infection according to occupation. Out of the 1520 subjects examined, the highest rate of concurrent infection 10(0.7%) was recorded among dependants from eighteen positive cases of urino-genital trichomoniasis and fifty-nine seropositive HIV case. Similarly, 4(0.26%), 1 (0.07%) and 1(0.07%) co-infection rates were recorded among civil servants, farmers and self-employed respectively while no case recorded among the drivers/cyclists. Statistically, frequency of concurrent infection did not vary significantly among different occupations ($p>0.05$).

Figure 4

Table 4: Concurrent infection between and HIV according to occupation

Occupation	T.V (%)	HIV (%)	Co-infection
Driving	0 (0)	69 (4.5)	0 (0)
Farming	3 (0.20)	38 (2.5)	1 (0.07)
Civil Service	8 (0.52)	19 (1.3)	4 (0.26)
Dependant	18 (0.7)	59 (3.9)	10 (0.7)
Self-employed	10 (0.7)	6 (0.39)	1 (0.07)
Total	**39 (2.6)**	**191 (12.6)**	**16 (1.1)**

DISCUSSION

Studies on epidemiology of urino-genital trichomoniasis and HIV infection in Adamawa state indicated an unprecedented 12.6%. HIV prevalence and 2.6% frequency rate of Trichomonas vaginalis. A concurrent infection rate of 1.1% between the parasite and the virus was also recorded. The distribution of concurrent infection by geographical zone showed a highest prevalence (1.2%) in the central zone whereas the highest frequency of urino-genital trichomoniasis (2.9%) and HIV infection (15.9%) were singularly recorded in northern and central zone respectively. The variation in the prevalence of infection in relation to geographical zone could be attributed to difference in the concentration of the urban settlements in each zone in consonance with previous report ($_{14}$) that the highest number of urban settlements was concentrated in the central zone of the state. Consequent upon this, more apparently healthy infected people could be attracted to the zone in preference to others due to availability of socio-economic activities thereby making the zone more vulnerable to infections.

The gender related prevalence study showed that females recorded higher rate of concurrent infection (0.90%) than their male counterparts with (0.20%). The variation in the prevalence of infection according to sex could be attributed to unequal member of males and females examined in the study. It could also be due to difference in the anatomical structure of genitor-urinary tract which makes females more vulnerable to sexually transmitted infections. Socio-economic inequalities and gender violence against young females could be some contributing factors to female higher susceptibility to infections. Poverty also constitutes a problem of high risk for young women. To make ends meet, some had probably taken to keeping multiple sex-partners or complete prostitution that lead to high rate of sexually

transmitted infections. The higher rate of infection recorded among females in this study agrees with the previous findings ([15,16,17,18, 19]). However, when the concurrent infection rate was categorized according to age, the highest (0.52%) was recorded within 15-24 years age bracket while no co-infection was recorded within 45-54 years age-group. From the present findings, it is obvious that concurrent infection is more frequent at young age than later in life. The physiological and anatomical structure of the single cell genitor-urinary tract of the younger subjects could be easily destroyed by the microorganisms making colonization easier than the multi-layer tract of the older subjects. The study compares favourable with earlier findings by some researchers ([16,17,18]) in which the highest prevalence rate of sexually transmitted infections was also recorded within the same age bracket. Our findings however disagree with another finding ([19]) which recorded highest prevalence of sexually transmitted infection among subjects within 24-30 years age group. The possible explanation for this variation could probably be due to the difference in geographical zone and socio-cultural patterns of the subjects in the studies. While the previous study was conducted in the Niger Delta area of Nigeria, this present one was carried out in the Northern-eastern part of the country where the socio-cultural activities are entirely different from that of the Niger-Delta.

Assessing the distribution of concurrent infection by marital status, the highest prevalence (0.59%) was recorded among the divorced subjects while the least (0.19%) was documented among the singled. Higher rate of infection among divorced subjects could be linked with frequency of unprotected sexual activities. Most of them were already exposed to free sex before their broken homes, hence sex is nothing new to them and they probably believed they have nothing astake therefore they are more at risk of infection. Single subjects on the other hand, were probably afraid of unwanted pregnancies since they are yet to marry therefore practicing protected sexual activities or complete abstinence. This study contrasts the findings of previous study ([20]) that reported no significant association between HIV prevalence and marital status. The reason for the disparity could probably be due to the difference in sample size and methods of assay. While this present study covered the entire state, the former was restricted to Yola metropolis of the state. Another reason could probably be due to the combination of Capillus and Standard Diagnostic Bioline kits employed in this study as against only Immunocomb kit employed in the previous one.

In this study, the highest rate of concurrent infection was recorded among the dependants. This group of people in this study refers to children of school age, apprentices and jobless or unemployed youths that still depend on their parents or guardians for living. By implication, members of this group are less occupied than their counterparts that have to fend for themselves. Consequently, they could be more easily involved in some immoral activities that can lead to sexually transmitted infections; after all “idle mind is the devil's work-shop”. This finding disagrees with others where highest infection prevalence was recorded among drivers ([20]) and among the traders ([19]). The reason for the variation could be due to difference in the levels of health education among the study population at different study areas.

In conclusion, from the present findings, co-existence between HIV and Trichomonas vaginalis is established in this locality. However, which of these organisms predisposed the other needs further research. Also, for proper management and control of HIV/AIDS in this environment, prevalence studies of concurrent infection between HIV and some other common sexually transmitted microorganisms are recommended.

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