

PREVALENCE OF TRICHOMONAS VAGINALIS AMONGST COMMERCIAL SEX WORKERS (CSWs) IN IBADAN, NIGERIA.

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Our main objectives was to determine the prevalence of Trichomonas vaginalis among commercial sex workers (CSW's) in Ibadan, Nigeria. One hundred and sixty nine CSW's randomly selected from 18 brothels and 136 female patients without symptoms were investigated for Trichomonas vaginalis using both direct microscopy and culture methods. Thirty-seven (21.9%) of the 169 CSW's investigated had Trichomonas whilst 26(19.1%) of the 136 control subjects were positive for Trichomonas vaginalis. There was no significant difference between the CSW's with Trichomonas and the control group ($p>0.001$). We found no association between T. vaginalis and HIV diagnosed in the CSW's investigated. The age range of peak incidence among the CSW's and the control subjects investigated was 20-29 years. While only 6(3.6%) of the CSW's investigated were married, 88(52.1%) were single, 37 (21.8%) separated, 28 (16.6%) divorced and 10(5.9%) widowed. There was no significant difference between the CSW's with vaginal Candidiasis, Gonorrhoea and the control group but genital ulcers and HIV positively were significantly higher ($p=0.000$) in CSW's than the control subjects. These findings suggest that women who exchange sexual services for money can no longer be ignored. They should be involved in the control and prevention of STDs.

INTRODUCTION

Trichomonas is widely distributed all over the world and remains a common infection among female patients attending sexually transmitted diseases clinics.

In developing tropical Africa, a prevalence rate among the female patients ranges between 5-37 percent. The World Health Organization (WHO) estimate 180 million cases of Trichomonal infection are acquired annually world wide (1) and it has been found to increase the risk of transmission of HIV and predispose pregnant women to premature rupture of membranes and early labour (2,3) Some estimates suggests that one out of five sexually active women contracts Trichomoniasis during her lifetime. Majority of female patients harbouring Trichomonas vaginalis present with vaginal discharge, which is usually frothy, greenish-yellow and offensive. Unlike pre-pubertal gonococcal vulvo-vaginitis cases occasionally encountered in Ibadan, Trichomoniasis among this age group is very rare(4). Dunlop and Wisdom found no T. vaginalis even in post pubertal virgins from the study done in 1965, which confirms sexual contact as the main mode of transmission. the control of Trichomoniasis seems to health care, whereas it has remained endemic in many developing countries where control may only be possible by regular screening and treatment.(2)

The prevalence of Trichomoniasis in specific groups correlates with the general level of sexual activity. Trichomoniasis has been diagnosed in 22.3 percent of women attending gynaecological

clinic in Ibadan (16), 19.6 percent of women attending special treatment clinic, Ibadan (7) and 5 percent among female patients attending out patient department in Lagos (8). Commercial sex workers (CSWs) are an important group for the transmission of a number of sexually transmitted diseases (STDs) including Trichomoniasis all over the world (9). They have held a time-honored position in STDs control, both as major reservoirs of the disease and a convenient, untraced source of infections (10). Evidence that CSWs may play a significant role in the spread of STDs such as Gonorrhoea and Trichomoniasis is accumulating (11-14). There are at present no comprehensive or reliable data on the prevalence of STDs especially Trichomoniasis among CSWs in Nigeria, however, evidence from studies in other countries show that it is quite high (15,9). In a study done in Osoba in 1972, 3(15.8 percent)of the 19 CSWs screened had Trichomoniasis.similar study done by Tanyuksel et al in Turkey on CSWs showed that 25 percent of them were positive for Trichomonas vaginalis. The aim of the present study was to determine the prevalence of Trichomonas vaginalis among CSWs in Ibadan.

MATERIAL AND METHODS

STUDY POPULATION.

Commercial sex workers (CSWs) working in 18 brothels that were randomly selected in Ibadan municipality were included in this prospective study. The study was done between February 1998 and March 2000, in cooperation with the health-nursing officers attached to the special treatment clinic, University College Hospital, the Directors of the brothels and the "presidents" of the inmates.

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Name, age, place of work, other occupation, parity, and marital status were noted. Symptoms of dysuria, low abdominal pain and vaginal discharge were routinely enquired. All the CSWs had a complete pelvic examination. Specimens for culture were taken with sterile cotton-tipped applicator from the urethral, vagina and endocervix.

CONTROL GROUP

136 female patients that attended special treatment clinic but without symptoms during the period of study were randomly selected and entered into the study.

LABORATORY PROCEDURES

The cervical and urethral swabs were Gram-stained for intra-cellular Gram-negative diplococci, and cultured onto Modified Thayer-Martin's medium. The plates were incubated at 37°C in an atmosphere of a candle extinction jar. Suspected oxidase-positive colonies were Gram-stained for Gram-negative diplococci and confirmation by Sugar utilization test in serum-free medium (17). Betalactamase activity of the isolates was tested using the Starch-paper technique (18).

Blood samples were taken and tested for HIV antibodies using a commercially available enzyme-linked immunosorbent assay (ELISA) and a Western blot (WB) assay using the procedures recommended by the manufacturer. The sera were also used for VDRL and TPHA tests.

SCREENING FOR TRICHOMONAS VAGINALIS

The high vagina swabs were examined for the presence of *Trichomonas vaginalis* by agitating the cotton swab in 1 ml of saline in a test tube and a drop of the resulting suspension transferred to a microscope which was covered with a cover slip and then examined at x 100 and x 400 magnification. The swabs were also examined for *Candida albicans*, *Gardnerella vaginalis* (Clue cells) and other parasites. Culture for *T. vaginalis* was performed using Nutrient broth glucose serum medium (19). Making a wet mount of sediment from the bottom of the Bijou bottles containing the medium made examination for growth of *Trichomonas vaginalis* at 48 hours and 5 days of incubation and motile *T. vaginalis* were searched for.

DATA ANALYSIS

Applying the t-test and the chi-square test did the statistical analysis.

RESULTS

During the period of study, 169 commercial sex workers (CSWs) randomly selected from 18 brothels and 136 female patients without symptoms were investigated for *Trichomonas vaginalis* at the Special treatment clinic, University College Hospital, Ibadan. Thirty-seven (21.9%) of the 169 CSWs had Trichomoniasis whilst 26 (19.1%) of the 136 control subjects were positive for *Trichomonas vaginalis*. There was no significant difference between the CSWs with Trichomoniasis and the control group. The vagina candidiasis was the most common STD diagnosed in both CSWs and the control group. The other STDs in their order of frequency in the CSWs were HIV infection 34%, Non-specific vaginosis (*Gardnerella vaginalis* infection) 24.9% and *Tinea cruris* 18.9%. Gonorrhoea and "Genital ulcers" had an incidence of 16.6% each. Syphilis seropositivity (table 1). All the 13 CSWs that had scabies, 4 (36.4%) with Genital warts and 19 (67.9%) with "Genital ulcers" had HIV infection. There was no significant difference between the CSWs with vaginal candidiasis, Gonorrhoea, Trichomoniasis and the control group. The HIV positive were significantly higher ($p < 0.001$) between "Genital ulcers" among CSWs (16.6%) and the control group (1.5%) was observed. The betalactamase producing strains constituted 97.6% of the gonococcal isolates.

Table 2 shows the age distribution of the CSWs and symptomless women investigated, 63.3% being within the age of 20 to 29 years while only 4.2% were over 50 years of age. Of the control subjects investigated, 58.1% were within the ages of 20 to 29 years. Table 3 shows that majority of the CSWs (74.5%) were of low parity (0-1).

Of the 169 CSWs seen, 88 (52.1%) were singles, 37 (21.8) separated, 28 (16.6) divorced and 10 (5.9%) widowed. Only 6 (3.6%) were married and these were not living in the brothels (Table 4). Ninety-three (55%) of them engaged in various types of contraceptive devices including the use of condom.

All the CSWs investigated admitted to regular use of prophylactic antibiotherapy in various combinations, common ones being weekly injection of spectinomycin.

Diagnosis	No of subjects	%	Control group	%
Gonorrhoea	28	16.6	21	15.4
Candidiasis	99	58.6	70	51.4
Trichomoniasis	37	21.9	26	19.1
Genital warts	11	6.5	3	2.2
Non-specific vaginosis (clue cells)	42	24.9	12	8.8
Scabies	13	7.7	---	---
"Genital ulcers"	28	16.6	2	1.5
Tinea cruris	32	18.9	13	9.6
Syphilis seropositivity	7	4.1	---	---
HIV-seropositivity	58	34.3	3	2.2

TABLE 1
DIAGNOSIS OF STDs IN CSWs AND THE CONTROL GROUP.

Age group (years)	No of subjects	%	Control group	%
10-19	19	11.2	20	14.7
20-29	107	63.3	79	58.1
30-39	23	13.6	16	11.8
40-49	13	7.7	14	10.8
>50	7	4.2	7	5.1
Total	169	100	136	100

TABLE 2
AGE DISTRIBUTION OF CSWs AND CONTROL GROUP EXAMINED.

No. of parity	No. of subjects	%	Control group	%
0-1	126	74.5	52	38.2
2-3	40	23.5	67	49.3
>4	3	1.8	17	12.5
Total	169	100	136	100

TABLE 3
PARITY OF CSWs AND THE CONTROL GROUP INVESTIGATED.

Marital status	NO. of subjects	%	Control group	%
Single	88	52.1	63	46.3
Married	6	3.6	32	23.5
Separated	37	21.8	25	18.4
Divorced	28	16.6	13	9.6
Widowed	10	5.9	3	2.2
Total	169	100	136	100

TABLE 4
MARITAL STATUS OF THE CSWs AND CONTROL GROUP INVESTIGATED.

DISCUSSION

Trichomoniasis remains one of the most common sexually transmitted diseases all over the world and like other STDs constitute a major public health problem in both developed and developing countries (20). Trichomoniasis is more prevalent among patients with higher levels of sexual activity and larger numbers of different sexual partners. It is not surprising, therefore, that CSWs are an important group for the transmission of a number of sexually transmitted diseases including Trichomoniasis.

A considerable number of unmarried unemployed women that engage in commercial sex work live comfortably in many brothels scattered around urban areas of Ibadan and cater for the sexual needs of men who pay cash in exchange for sex (21). The data on the prevalence of STDs such as Trichomoniasis vary around the world, depending on the reliability of the diagnostic test used on them and their response to medical examination. Some of them declared to be examined or investigated and these were the older women who now acts as the "godmothers" to the younger CSWs.

The spectrum of STDs among the CSWs investigated has widened since the previous study done in 1972 by Osoba in our center. While Gonorrhoea and Trichomoniasis were the only STDs diagnosed, a wider spectrum of STDs among the CSWs investigated was demonstrated. In the present study, 37(21.9%) of the 169 CSWs investigated had Trichomoniasis whilst 26(19.1%) of the 136 control subjects were positive for *Trichomonas vaginalis*. There was no significant difference between the CSWs with Trichomoniasis and the control group. The vaginal candidiasis was the most common STD diagnosed in both CSWs and the control group. The other STDs in their order of frequency in the CSWs were HIV infection 34.3%, non-specific vaginosis 24.9%, Tinea cruris 18.9%, Gonorrhoea 16.6%, scabies 7.7%, Genital warts 6.5% and Syphilis seropositivity 4.1%. this achievement was partly due to the fact that majority of the CSWs were examined and investigated in their hotels rooms and there was an improvement in the diagnostic methods used in this study. While Osoba in 1972 used only direct microscopic method in the screening for *T.vaginalis*, both the direct

microscopic and culture methods were used in this study. Our finding is consistent with those of Turner and Morton (1976) in Sheffield, Meheus et al (1974) and many other workers (16, 22-31), who demonstrated a reasonably high incidence of STDs among CSWs.

Most of the CSWs encountered during the study were young, with about three quarters being below 30 years. This is not unexpected as there is usually a higher demand for the younger women by men who patronize commercial sex workers. This is keeping with the findings reported by other researchers in Nigeria and elsewhere (21,32,33). In this study, over half of the CSWs were single whilst another third were either divorced or separated ; a tiny proportion was widowed. This compares favourably with the findings of another study on sex in Ibadan in 1998 (32) which observed that over half of CSWs were either separated, divorced or widowed whilst about 40% were single and this was attributed to the traditional extended family system which hitherto had served as a social institution gradually breaking down due to the process of urbanization and hence such categories of women who otherwise would have been taken care of in traditional setting find that they now have to fend for themselves.

It has been reasonably established that the presence of STD in a person is associated with an increased risk of HIV infection following exposure by a factor of three to five and can be as high as 10-300 fold in the presence of a genital ulcer (34). *Trichomonas vaginalis* has been considered a major risk factor in the transmission of human immunodeficiency virus (HIV) (35). In a study done by Niccolai et al in 2000, a high rate of reinfection with *Trichomonas vaginalis* in HIV-infected women was demonstrated. We, however, found no association between *T.vaginalis* and HIV diagnosed in the CSWs investigated. Similarly, there was no significant difference between CSWs with vaginal candidiasis, Gonorrhoea and Trichomoniasis and the control group but a high significant difference between CSWs with HIV infection and control subjects was demonstrated. The implication of this is probably that apart from HIV infection that is presently untreatable, the role of CSWs as vectors of STDs has gradually declined in importance as compared with the promiscuous amateurs who pose a serious threat to

the control of STDs. One of the reasons for failure to interrupt STD transmission could be that these transmissions are frequently as a result of sexual exposures with these promiscuous amateurs who parade themselves as 'responsible' ladies on the street.

The magnitude of the problem of Trichomoniasis in infected individuals need to be considered. Trichomoniasis like other STDs such as Gonorrhoea and Chlamydial infections can be associated with some complications.(4). *Trichomonas vaginalis* has been identified in pus from the fallopian tubes in patients with acute salpingitis, though; a casual relationship was not demonstrated (37). However, Ogunbanjo et al (1989) in a study on infective factors of male infertility among Nigeria found *T. vaginalis* to be one of the causative agents of conjugal infertility. A similar study done by el-Sharkawy et al (39) found infertile women with *T.vaginalis* to have decreased C3 & C4 and increased 1Ga level in the vaginal discharge with serum prolactin incriminating *T.vaginalis* as one of the causes of their infertility. The control of STDs can best be accomplished by public health programs that commit themselves to finding STD transmitters through persistent efforts to screen, diagnose, treat, and follow-up on high risk individual within communities. Women who exchange sexual services for money are at risk and can no longer be ignored. They should be identified and involved in STD prevention and control efforts (10).

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REFERENCES

1. Brown M.T. Trichomoniasis. Practitioner. 1972; 209:639.
2. Bowden, F.J., Garnett, G, P. *Trichomonas vaginalis* epidemiology: Parameterising and analyzing a model of treatment interventions. Sexually Transmitted Infections. 2000; 76(4): 248-56.
3. Gulmezoglu, A.M., Forna, F. Interventions for treatment Trichomoniasis in Women. Cochran Database of systematic Reviews (computer

- file). 2000;2: Cd000218.
4. Bakare,R. A.,Ashiru, J.O., Adeyemi-Doro. F.A.B., Ekweozor, C.C., Oni, A.A., Okesola, A.O., and Adebayo, J.A. Non-gonococcal urethritis (NGU) due to *Trichomonas vaginalis* in Ibadan. West African Journal of Medicine. 1999; 18(1): 64-68.
5. Dunlop, E.M.G., Wisdom, A.R. Diagnosis and management of Trichomoniasis in men and women. Brit. J. Vener. Dis. 1965; 41:85.
6. AIMAKHU, V.E. Trichomonal vaginitis treated with a single dose of tinidazole,full Report. Int.J. Gynaecol. Obstet. 1974; 12: 84.
7. Ogunbajo, B.O., Osoba, A.O. Trichomonal vaginitis in Nigeria women. Trop. Geogr. Med. 1984; 36:67.
8. Somorin, A.O., and Orebiyi, H.I.V. Microbiological study of STD among patients in a Nigeria Hospital. Centr. Afri. J. Med. 1981;27:42.
9. Tanyuksel, M., Gun, H., Doganci, L.Prevalence of *Trichomonas vaginalis* in prostitutes in Turkey. Central European Journal of Public Health. 1996; 4(2): 96-7.
10. Potterat J.J., Rothenberg R and Bross D.C. Gonorrhoea in street prostitutes: Epidemiologic and legal implications. Sexually Transmitted Disease. 1979;vol6,2:58-63.
11. Wilcox R.R. Prostitution and venereal disease . Br.J. Vener Dis 1961; 38:37-42.
12. Wren B.G. Gonorrhoea among prostitutes. Med.J. Austr. 1967; 1: 847-848.
13. Dunlop,E.M.C., Lamb A.M.A and King D.M. Improved tracing of contacts of heterosexual men with Gonorrhoea. Br.J. Vener . Dis. 1976; 52: 192-195.
14. Turner E.D., Morton R.S. Prostitution in Sheffield Br.J.Vener. Dis. 1976; 52:197-203.
15. Pal N.K., Chakraborty M.S., Das A. Khodkevich L, Jana S. Chkraborty A.K. Community based survey of STD/HIV among commercial sex workers in Calcutta (India). Part IV: Sexually Transmitted Diseases and related risk factors. Journal of Communicable Diseases. 1994; 26(4): 197-202.
16. Osoba A.O., Epidemiology of urethritis in Ibadan. Brit. J. Vener. Dis. 1972;48:116-120.
17. Flynn. J. and Waitins S.A., A serum free medium for testing fermentation reaction in *Neisseria gonorrhoeae*. J. Clinic Path. 1972;25: 525-527.
18. Odugbemi, T.O., Hafiz S, McEntegart M.G. Penicillinase-producing *Neisseria gonorrhoeae*: Detection by starch paper technique. British Medical Journal 1977;2:500.

19. Adebayo, J.A. Isolation of *Trichomonas vaginalis*: a simple diagnostic medium for use in developing countries. *Med. Lab Sc* 1986; 43:91-92.
20. Diane S. Plorde. Sexually transmitted disease in Ethiopia. Social factors contributing to their spread and implications for developing countries. *Br.J. Vener Dis* 1981;57:357-362.
21. Meheus, A.,A. De Clercq and Prat R. Prevalence of gonorrhoea in prostitutes in a Central African town. *Brit.J. Vener. Dis* 1974;50:50-52.
22. Baeten J.M., Richardson B.A., Martin H.L Jr., Nyange P.M, Larveys L, Ngugi E.N., Mandaliya K., Ndinya-Achola J.O., Bwayo J.J., Kreiss J.K.Trends in HIV-1 incidence in a cohort of prostitutes in Kenya: implications for HIV-1 vaccine efficacy trials. *Journal of Acquire Immune Deficiency Syndromes*. 2000;24(5):458-464.
23. Ishi K, Suzuki F, Saito A and Kubota T. Prevalence of human papillomavirus infection and its correlation with cervical lesions in commercial sex workers in Japan. *Journal of Obstetrics & Gynaecology Research* 2000;26(4):253-257.
24. Kubota T, Ishi K, Suzuki M, Utsuno S, Igari J. Prevalence of human papillomavirus infection in women attending a sexually transmitted disease clinic Kansenshogaku Zasshi-Journal of the Japanese Association for infectious Diseases. 1999; 73(3): 233-238.
25. Sohn M, Jin K. AIDS-related perceptions and condom use of prostitutes in Korea. *Yonsei Medical Journal*. 1999;40(1): 9-13.
26. Ndoyé I, Mboup S., De Schryver A., Van Dyck E., Moran J., Samb N.D., Sakho M.L., Thior I., Wade A., Heymann D.L., Meheus A. Diagnosis of sexually transmitted infections in female prostitutes in Dakar, Senegal. *Sexually transmitted infections*. 1998;74(1): S112-117.
27. McDonnell R.J., McDonnell P.M., O'Neil M, Mulcahy F. Health risk profile of prostitutes in Dublin. *International Journal of STD &AIDS*. 1998;9(8):485-488.
28. Elison K.W., Boles J, Darrow W,W., Sterk C,E. HIV seroprevalence and risk factors among clients of female and male prostitutes. *JAIDS:Journal of Acquired Immune Deficiency Syndromes*. 1999;20(2): 195-200.
29. Buzingo T., Alary M., Sokal D.C., Sidel T.The prevalence of HIV and the risk behavior of prostitutes living in 2 populous regions of Bujumbura (Burundi) *Sante*.1997;7(6): 355-360.
30. Tchoudomirova K., Domeika M., Mardh P.A., Democratic data on prostitutes from Bulgaria- a Recruitment country for international (migratory) prostitutes. *International Journal of STD & AIDS*. 1997;8(3): 187-191.
31. Zapiola I, Salomone S, Alvarez A, Scolastico M.C., Koessel R.A., Lemus J, Wainstein C, Muchinik G. HIV-1, HIV-2, HTLV-1 and STD among female prostitutes in Buenos Aires, Argentina. *European Journal of Epidemiology*. 1996; 12(1):27-31.
32. Umar S.U.Knowledge, attitude, perspective practices and treatment seeking behaviour regarding sexually transmitted diseases among commercial sex workers in Ibadan. A dissertation submitted in partial fulfillment of the requirement for the degree of master of public health 1998.
33. Uribe-Salas F.,Hernandez-Avila M., Condo-Glez C.J., Juarez-Figueroa L, Allen B, Anaya-Ocampo R, Dei Rio- Chriboga C, Uribe-Zuniga P. Low prevalence of HIV infection and sexually transmitted diseases among female commercial sex workers in Mexico City. *Am.J. Public health*. 1997;87:1012-1215.
34. Adler M, Foster S, Richens J. and Slavin H. Sexual health care: Sexually transmitted infections. Guidelines for prevention and treatment. ODA HEALTH AND POPULATION OCCASIONAL PAPER London, 1996;10-17.
35. Mayta, H., Gilman, R.H., Calderon, M.M., Gottlieb, A, Soto. G., Tuero, I., Sanchez, S., Vivar, A.185 ribosomal DNA-based PCR for diagnosis of *Trichomonas vaginalis*. *J. Clin. Microbiol*. 2000;38(7): 2683.
36. Niccolai, L.M.,Kopicko, J.J., Kassie, A., Petros, H., Clark, R.A., Kissinger, P. Incidence and predictors of reinfection with *Trichomonas vaginalis* in HIV-infected women. *Sexually Transmitted Diseases*. 2000;27(5): 284-8.
37. Gallai, Z., Sylvester, L. The present status of urogenital Trichomoniasis : A review of the literature. *Appl Therapeutics*. 1966; 8: 773.
38. Ogunbanjo, B.O., Osoba, A.O., Ochei, J. Infective factor of male infertility among Nigerians. *Afri. J. Med. Sci*. 1989;18:35-38.
39. El-Sharkawy I.M., Hamza, S.M., el-Sayed, M.K. Correlation between *Trichomonas vaginalis* and female infertility. *Journal of the Egyptian Society of Parasitology*. 2000;30(1):287-94.