Sexually transmitted infections among patients attending the General Practice Clinic, Wesley Guild Hospital, Ilesa, Nigeria

[a] **Olakolu SS,** FWACP [a, b] **Abioye-Kuteyi EA,** FMCGP, FWACP, FRACGP [a] **Oyegbade OO**, FWACP
[a] General Practice Department, Obafemi Awolowo University Teaching Hospitals' Complex, Ile-Ife, Osun State, Nigeria
[b] Community Health Department, Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria
Correspondence to: Emmanuel A Abioye-Kuteyi, e-mail: eakuteyi@msn.com
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Abstract

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Background: Sexually transmitted infections (STIs) are among the most common infectious diseases in the world today. There are few reliable statistics on the true prevalence of STIs in developing countries, especially in the general practice setting, hence the need to determine the prevalence in each locality. With the scourge and pandemicity of human immunodeficiency virus (HIV) and the fact that STIs are recognised as independent risk factors for its transmission, determining the risk profiles for STIs has become paramount. The aim of this study was to describe the pattern of STIs among patients attending a Nigerian general practice (GP) clinic.

Methods: This was a descriptive, cross-sectional, hospital-based study. Consenting patients were recruited serially between February and April 2006 until the sample size of 415 was reached. Subjects' genital symptoms were considered according to the four common STI syndromes according to National AIDS/STD Control Programme guidelines.

Results: The age range of the subjects was 15 to 95 years (mean 45.16 years, standard deviation 18.83 years, median 44 years). The median age at coitarche was 21 years while the median age at marriage was 25 years. The prevalence rates of current, past and lifetime STI were 18.8%, 22.4% and 32% respectively. Only 28 (6.8%) study subjects had laboratory evidence of STIs at the time of study. Previous sex with a commercial sex worker, previous history of STIs, premarital sex, first intercourse before or at 21 years of age and multiple sexual partners were significantly associated with STIs. Previous history of STIs was a strong predictor of current STI in this study while premarital sex and previous sex with a commercial sex worker were strong predictors of past STI. The frequency of HIV infection among subjects with STIs was more than double that of the control and a co-infection rate of 17.9% was found.

Conclusions: The findings of this study indicate a high prevalence of STIs in the study community in association with prevailing high sexual risk behaviours, hence the need for reliable control programmes targeting the latter.

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Introduction

In developing countries, there is an upsurge in the incidence of sexually transmitted infections (STIs) as increasing urbanisation, modernisation, travel, education and exposure to Western media have increased sexual activity, especially among young people.[1,2] STIs are often asymptomatic, particularly in women.[1,3] Identified risk factors for STIs include multiple sexual partners (associated with early coitarche, premarital and extramarital sex), inconsistent use of condoms and sexual preferences.[1,3,4,5] Previous STI, exposure to a symptomatic partner and suppressed immunity are also recognised predisposing factors.[6,7,8] STIs and their complications result in substantial morbidity and mortality independent of their role in the transmission of human immunodeficiency virus (HIV).

Good clinical care for patients with STIs should extend beyond therapy and include help to avoid future infections. Control activities should focus on the primary prevention of infection through safer sexual practices, including condom use.[1,6] Strategies for improving secondary prevention (health care-seeking behaviour and case management) should include identification of people at high risk of acquiring and transmitting infections and targeting them for intervention.[4,8] The family physician has a unique role to play in the control of STIs, yet few reports are available on the prevalence of STIs and its risk profiling in the general practice setting,[9,10,11]

especially in developing countries. This study therefore set out to describe the pattern of STIs in a general practice clinic in south-western Nigeria with the specific objectives to determine the prevalence and identify the sexual behaviours associated with STI in the study population.

Subjects and methods

This was a descriptive, cross-sectional, hospital-based study of the prevalence of STIs and risk factors among patients attending the General Practice (GP) Clinic of the Wesley Guild Hospital in Ilesa, situated in south-western Nigeria. The target population for this study consisted of all registered patients that presented at the GP clinic within the three-month period February to April 2006. The GP clinic serves people aged 15 years and older. An average of 300 patients is seen in this clinic weekly and about 15 000 patients are seen annually. Patients present to the clinic for various reasons, ranging from medical check-up to illness. Patients other than those on follow-up are assigned to doctors by practice nurses in a systematic manner as they arrive. A total of 415 consenting patients attended by the first author were recruited serially for the study. The patients' complaints were first attended to. Detailed history of genital symptoms, age of coitarche, age at marriage, history of premarital sex, extramarital sex, use of condom, previous STIs, number of sexual partners and previous sex with commercial sex workers (CSWs) was obtained from consenting patients with the aid of a pre-tested interviewer-administered questionnaire. Genital examination was then performed and urethral, vaginal and endocervical swabs were taken as the case may be for microscopy, culture and sensitivity. The specimens were processed in the on-site hospital laboratory using standard methods.

Subjects' genital complaints were considered according to the four common STI syndromes defined by the National AIDS and STD Control Programme flow charts. Male subjects that presented with urethral discharge and/or painful urination were considered to have urethritis. They all had urethral swabs taken for microbiological examination. Subjects in this group who had no improvement after seven days of treatment for urethritis or those who had laboratory evidence of trichomonas infection were treated for trichomoniasis. Female subjects with abnormal vaginal discharge who met the criteria in Box 1 were diagnosed with cervicitis. Abnormal vaginal discharge that did not fit these criteria was regarded as vaginitis. Subjects with abnormal vaginal discharge also had vaginal and endocervical swabs taken for microbiological examination. Further differentiation based on the characteristics of the abnormal vaginal discharge into candidiasis, bacteria vaginosis and trichomoniasis was also done. Subjects with thin, homogenous, malodorous white to grey vaginal discharge adherent to the vaginal mucosa and pruritus were diagnosed with bacterial vaginosis. Subjects with itchy, thick, odourless, white (cheese-like) vaginal discharge with or without erythema of the labia, vulva and vagina were diagnosed with candidiasis, while subjects with yellowish, whitish or greenish discharge with or without pruritus were diagnosed with trichomoniasis.[3] Female subjects with lower abdominal pain were treated for pelvic inflammatory disease (PID) if the criteria in Box 2 were met.

Box 1:
Criteria for diagnosing cervicitis
- Abnormal vaginal discharge and
- Urethral discharge in male partner or at least two of the following:
  - unmarried
  - age < 21 years and sexually active
  - ≥ 2 sexual partners in last 12 months
  - new sexual partner in last 3 months

Box 2:
Criteria for diagnosing pelvic inflammatory disease
- Lower abdominal pain and
- One of the following:
  - positive cervical excitation test
  - vaginal discharge
  - urethral discharge in male partner
  - dyspareunia
  - temperature > 38 °C

Those subjects with genital sores or ulcers were treated for genital ulcer disease (GUD). Further clinical differentiation of genital ulcers into chancroid, syphilitic chancre and herpes was based on unilateral painful ulcer or papule on the genital organ with inflammatory inguinal adenopathy for chancroid, and group of painful blisters for herpes. Subjects with GUD or past history of genital sores, excoriation and warts had the Venereal Disease Research Laboratory (VDRL) test for syphilis. All the subjects that had the VDRL test and/or laboratory evidence of STI had pre-test counselling and were tested for retroviral infection using the enzyme linked immuno-sorbent assay (ELISA) method. The same number of subjects matched for age and sex among those who did not have STI were also tested for retroviral infection after pre-test counselling. A capillary blood sample was used for the retroviral test, which was performed as an office procedure. Positive ELISA test results were confirmed by Western blot. The HIV-positive subjects were referred after post-test counselling to the Haematology Unit for further management. At the Haematology Unit, further investigations included viral load, CD4 and CD8, and free antiretroviral drugs were provided when indicated. Those subjects with STI were educated on STI and the use of condoms, and were encouraged to adhere to treatment. They were also asked to inform their partners to seek medical treatment.

Study subjects were assessed for STI from three perspectives, namely current STI, past STI and lifetime

STI. Current STI represents presence of STI at the period of study, while past STI refers to a history of ever having a previous STI which had resolved before recruitment for the study. Lifetime STI refers to the occurrence of STI whether in the past or at the time of study. Co-infection rate of STI/HIV was determined as the percentage of subjects with both STI and HIV infections among the subjects with GUD and/or laboratory evidence of STI.[5] Females who had not had sexual intercourse and therefore were not be considered appropriate for vaginal examination without clinical indication were excluded from the study. Females who had vaginal bleeding were also excluded from the study. All data collected were fed into a computer using the SPSS for Windows software version 11. Simple descriptive, bivariate and multivariate analyses were performed. Relative frequencies, mean, median, mode and prevalence of STIs were determined. Odds ratio, 95% confidence interval, chi square and p-value were calculated as appropriate to determine the associated risk factors for STIs. The level of significance was set at $p \leq 0.05$. The significantly associated risk factors were put through linear regression to determine the predictors of acquisition of STIs.

Results

The age range of the subjects was 15 to 95 years (mean 45.16 years, standard deviation 18.83 years, median 44 years). The median age at coitarche was 21 years while the median age at marriage was 25 years. The socio-demographic characteristics of the subjects are presented in Table I.

Table I: Socio-demographic distribution of the study subjects (n = 415)

Characteristics	n (%)
Age group	
15–24 years	56 (13.5)
25–34 years	96 (23.1)
35–44 years	61 (14.7)
> 44 years	202 (48.7)
Sex	
Male	140 (33.7)
Female	275 (66.3)
Marital status	
Single	86 (20.7)
Married	267 (64.3)
Widowed	58 (14.0)
Separated	4 (1.0)
Employment status	
Paid employment	83 (20.0)
Self-employed	248 (59.8)
Unemployed	84 (20.2)
Education	
No formal education	146 (35.2)
Primary	119 (28.7)
Secondary	74 (17.8)
Tertiary	76 (18.3)
Religion	
Christian	359 (86.5)
Muslim	56 (13.5)

Table I shows that the majority of study subjects were 45 years or older, female, married, self-employed, belonged to the Christian faith and had at least primary education.

Figure 1 shows that the prevalence of current STI among study subjects was 18.8%. Among female and male subjects, 57 (20.7%) and 21 (15%) respectively had current STI.

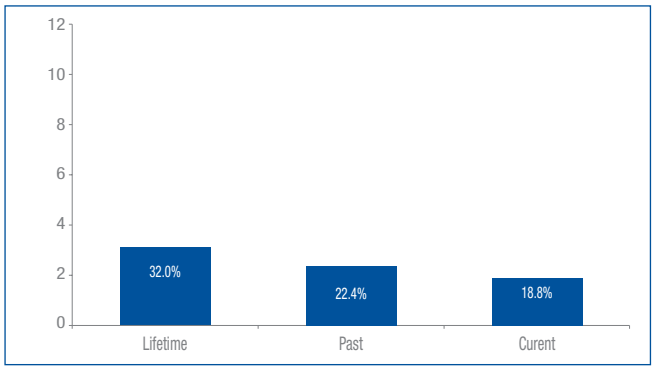

Figure 1: Prevalence of STI among study subjects (%)

Laboratory report

Only 28 (6.8%) study subjects had laboratory confirmation of STIs; 22 (5.3%) of the study subjects had candidiasis while six (1.5%) had trichomoniasis. There was no subject with neisseria gonorrhea or syphilis. There were no laboratory resources to establish the diagnosis of chlamydia, herpes and lymphogranuloma venereum. Eighteen (81.8%) and two (33.3%) of the study subjects with laboratory diagnosis of candidiasis and trichomoniasis, respectively, were correctly identified on clinical grounds.

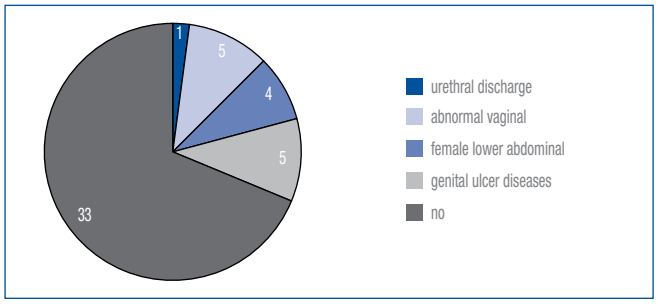

Figure 2: Distribution of STI syndromes among study subjects

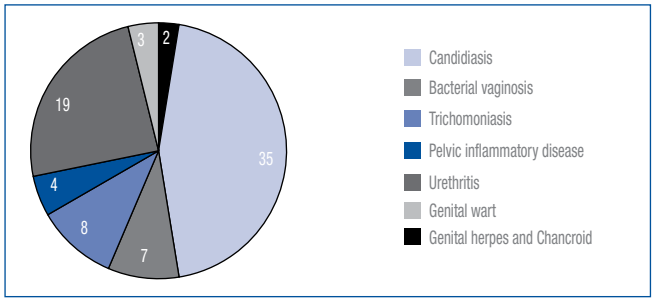

Figure 3: Distribution of subjects with genital infections by clinical diagnosis

Figure 2 shows that 50 (12.0%) of the study subjects had abnormal vaginal discharge while only four (1.0%) females had lower abdominal pain.

Figure 3 shows that the majority (44.9%) of the study subjects with genital infections had candidiasis. It also shows that only one subject each had genital herpes and chancroid.

Table II shows that previous sex with a CSW and previous history of STI were significantly associated with current STI.

Table III shows that having premarital sex, previous sex with a CSW, first intercourse before/at 21 years of age and multiple sexual partners were significantly associated with past STI.

Table II: Distribution of current STI by risk factors for STI among study subjects

Characteristics	Current STI Yes	No	X^2	df	(p-value)	OR,	95% CI
Currently married							
Yes	46 (17.2)	337 (81.2)	1.204	1	(0.273)	1.325,	0.801–2.194
No	32 (21.6)	116 (78.4)					
Age at marriage							
≤ 25 years	38 (18.5)	167 (81.5)	0.557	1	(0.455)	1.257,	0.688–2.297
> 25 years	19 (15.3)	105 (84.7)					
Premarital sex							
Yes	47 (20.3)	185 (79.7)	0.738	1	(0.390)	1.246,	0.754–2.057
No	31 (16.9)	152 (83.1)					
Extramarital sex							
Yes	11 (22.0)	39 (78.0)	0.900	1	(0.343)	1.429,	0.682–2.995
No	46 (16.5)	233(83.5)					
Previous sex with CSW							
Yes	6 (40.0)	9 (60.0)	4.533	1	**(0.033)**	3.024,	**1.042–8.776**
No	69 (18.1)	313 (81.9)					
Previous history of STI							
Yes	35 (37.6)	58 (62.4)	27.872	1	**(0.001)**	3.915,	**2.309–6.641**
No	43 (13.4)	279 (86.6)					
Age at coitarche							
≤ 21 years	42 (19.9)	169 (80.1)	0.302	1	(0.583)	1.152,	0.695–1.911
> 21 years	33 (17.7)	153 (82.3)					
Lifetime no of partners							
1	27 (19.7)	110 (80.3)	0.091	1	(0.763)	1.081,	0.620–1.890
> 1	48 (18.5)	212 (81.5)					
Consistent use of condom							
Yes	1 (7.7)	12 (92.3)	1.100	1	(0.294)	0.358,	0.045–2.727
No	74 (19.3)	310 (80.7)					

Table III: Distribution of past STI by risk factors for STI among study subjects

Characteristics	Past STI Yes	No	X^2	df	(p-value)	OR,	95% CI
Currently married							
Yes	65 (24.3)	202 (75.7)	1.612	1	(0.204)	0.725,	0.441–1.192
No	28 (18.9)	120 (81.1)					
Age at marriage							
≤ 25 years	52 (25.4)	153 (74.6)	0.856	1	(0.055)	1.767,	0.997–3.134
> 25 years	20 (16.1)	104 (83.9)					
Premarital sex							
Yes	69 (29.7)	163 (70.3)	16.265	1	**(0.001)**	**2.804,**	**1.679–4.686**
No	24 (13.1)	159 (86.9)					
Extramarital sex							
Yes	15 (30.0)	35 (70.0)	2.272	1	(0.132)	1.669,	0.853–3.266
No	51 (20.4)	196 (79.6)					
Previous sex with CSW							
Yes	10 (66.7)	5 (33.3)	16.249	1	**(0.001)**	**7.205,**	**2.397–21.660**
No	83 (21.7)	299 (78.3)					
Age at coitarche							
≤ 21 years	61 (28.9)	150 (71.1)	7.551	1	**(0.006)**	**1.957,**	**1.180–3.273**
> 21 years	32 (17.2)	154 (82.8)					
Lifetime no of partners							
1	19 (13.9)	118 (86.1)	10.650	1	**(0.001)**	**0.404,**	**0.220–0.731**
> 1	74 (28.5)	186 (71.5)					
Consistent use of condom							
Yes	2 (15.4)	11 (84.6)	0.484	1	(0.486)	0.585,	0.127–2.690
No	91 (23.7)	293 (76.3)					

Table IV: Distribution of lifetime STI by risk factors for STI among study subjects

Characteristics	Lifetime STI Yes	Lifetime STI No	X^2	df	(p-value)	OR,	95% CI
Currently married							
Yes	88 (33.0)	179 (67.0)	0.255	1	(0.593)	0.889,	0.576–1.371
No	45 (30.4)	103 (69.6)					
Age at marriage							
≤ 25 years	71 (34.6)	134 (65.7)	2.000	1	(0.094)	1.523,	0.929–2.498
> 25 years	32 (25.8)	92 (74.2)					
Premarital sex							
Yes	87 (37.5)	46 (25.1)	7.181	1	**(0.007)**	**1.787,**	**1.166–2.738**
No	46 (62.5)	137 (74.9)					
Extramarital sex							
Yes	20 (40.0)	30 (60.0)	2.072	1	(0.150)	1.574,	0.846–2.930
No	83 (29.7)	196 (70.3)					
Previous sex with CSW							
Yes	10 (66.7)	5 (33.3)	8.145	1	**(0.004)**	**4.367,**	**1.461–13.053**
No	120 (31.4)	262 (68.6)					
Age at coitarche							
≤ 21 years	76 (36.0)	135 (64.0)	2.191	1	(0.139)	1.376,	0.901–2.101
> 21 years	54 (29.0)	132 (71.0)					
Lifetime no of partners							
1	38 (27.7)	99 (72.3)	2.38	1	(0.123)	0.700,	0.430–1.130
> 1	92 (35.4)	168 (64.6)					
Consistent use of condom							
Yes	2 (15.4)	11 (84.6)	1.839	1	(0.175)	0.364,	0.079–1.665
No	128 (33.3)	256 (66.7)					

Table V: Linear regression analysis of current, past and lifetime STI by risk profiles for STI among study subjects

Characteristics	Current STI Beta	Current STI t	Current STI sig	Past STI Beta	Past STI t	Past STI sig	Lifetime STI Beta	Lifetime STI t	Lifetime STI sig
Previous history of STI	0.195	3.427	**0.001**	Not applicable			Not applicable		
Previous sex with CSW	-0.021	-0.360	0.719	0.146	2.538	**0.012**	-0.038	-0.941	0.347
Premarital sex	0.110	1.237	0.217	0.185	2.132	**0.034**	0.068	1.127	0.260

Table VI: Comparison of HIV infection among subjects with GUD and/or laboratory diagnoses of STI with controls

	HIV status					
Subjects	Positive (%)	Negative (%)	n	X^2	df	p-value
STI*	5 (15.2)	28 (84.8)	33	1.438	1	(0.230)
Control	2 (6.1)	31 (93.9)	33			

*Subjects with GUD and/or laboratory diagnosis of STI were tested for HIV

Table IV shows that having premarital sex and previous sex with a CSW were significantly associated with having had STI at any time in the lifetime.

Tables II, III and IV show that a comparatively higher proportion of subjects who used condoms inconsistently had STIs compared to subjects who used condoms consistently, as well as those who had extramarital sex compared to those who did not, although these proportions were not significantly different ($p > 0.05$).

Table V shows that having previous history of STI is a strong predictor of current STI among study subjects. It also shows that having had premarital sex and previous sex with a CSW are strong predictors of past STI.

Table VI shows that the proportion of HIV infection among subjects with STI was more than double that of the controls, even though the difference was not statistically significant. An STI/HIV co-infection rate of 17.9% was found.

Discussion

In this study, the prevalence of current STIs in a general practice setting was found to be 18.8%. In the second Dutch National Survey of General Practice,[9] 39 per 10 000 consultations were STI related. Similarly, Johnston, et al reported that the management of diagnosed STIs constituted a small part of the GP's workload in Australia.[10] The higher prevalence of STIs in the present study may partly be explained by the fact that our subjects were

screened for STIs, unlike the latter analyses which were based on primary consultations for STI-related conditions. Screening of clinically asymptomatic subjects is part of the global strategy for the prevention and control of STIs.[12] In a community-based study in Southern India, a prevalence of STIs of 15.6% was reported.[13] The slightly higher prevalence in our study could be because the present study was hospital based. The most common syndrome in this study was vaginal discharge (12.0% of subjects) followed by urethral discharge (4.6% of subjects). Correspondingly, 1.2% had GUD syndrome while 1.0% had lower abdominal pain (LAP) syndrome. This corroborates the finding that vaginal discharge is the most common STI syndrome,[14,15] although a study in an STI clinic in the Mwanza region of Tanzania reported urethral discharge as the most common syndrome followed by vaginal discharge.[16]

In this study, the prevalence of past STI (22.4%) is higher than the prevalence of current STI (18.8%). This is expected, however, as the determination of past STI in this study puts into consideration a longer period of sexual exposure than for current STI. A study in the USA reported a lower past STI prevalence of 12% but this was over the three months preceding the study.[17] Lifetime STI prevalence in the current study was correspondingly high (32%). Lawoyin and Walker[18] reported a lower prevalence of lifetime STI of 22.1% in a community-based study. The high prevalence of current, past and lifetime STI in this study signifies the need to intensify efforts aimed at the control of STIs in the study locality. Effective control of STIs becomes vitally important, since STI has been recognised as an independent risk factor for transmitting and acquiring HIV infection. Only 6.8% of the subjects in this study had laboratory evidence of STI. This prevalence is remarkably lower than the prevalence of current STI of 18.8% by syndromic diagnosis. This finding corroborates the earlier finding that the prevalence of STI with the WHO syndromic algorithm using common signs and symptoms to guide presumptive treatment is higher than that from laboratory reports, especially poorly resourced communities where diagnostic facilities are limited, as in this study community.[19] It has also been found that most of the self-reported genital symptoms could not be linked to a laboratory-detected STI.[13,20] Nevertheless, in this study, the inability to establish a laboratory diagnosis of chlamydia, chancroid, herpes and lymphogranuloma infections could have contributed to the lower microbiological prevalence. This further highlights the usefulness of syndromic diagnosis where laboratory facilities are grossly inadequate. There was no subject with gonorrhea diagnosed either on clinical grounds or by the laboratory method. Similarly, none of the subjects had laboratory evidence of syphilis. This may be partly because, with the advent of potent antibiotics, the prevalence of bacterial and treponemal STIs had declined.[21] Another possible explanation could be that the low sensitivity of the VDRL test used for screening for syphilis in this study gives high false negative results.[22] Except for studies done in STI clinics or among people involved with transactional sex, recent studies in Nigeria had reported low prevalence of *Neisseria Gonorrhoeae* infections (0.7% in a community-based study and 1.3% in a hospital-based study).[23,24] A similarly low prevalence (1.7%) was reported for treponema pallidum infection.[4,24] In this study, on both clinical and laboratory grounds, *Candida Albicans* was the most common pathogen, followed by *Trichomonas Vaginalis.* The majority of prevalence studies in Nigeria also reported similar findings.[23–26] A similar pattern was also identified by Fonck et al in Kenya.[27] Behets et al[8] and Kafi et al,[28] however, found that bacterial vaginosis was the most common problem among women with vaginal discharge syndrome in Madagascar and Sudan respectively.

Having multiple sexual partners is a known sexual risk factor for STIs. This sexual behaviour was found to be significantly associated with STI in this study. A similar association had been reported that by several studies.[6,29] Mostafa and Roshdy[6] reported multiple sexual partners in the preceding year, five years or during a lifetime carried a risk for the acquisition of genital infections. They also found that having multiple sexual partners was a significant predictor of genital infections.[6] Tanfer, Cubbins and Billy[30] established in their study that the likelihood of an STI dramatically increases with lifetime number of sex partners when compared to subjects who had only one partner: those with two to three partners were five times more likely to have had an STI and the odds were as high as 31:1 for those who reported 16 or more partners. A study by Ekanem et al among high-risk commercial bus drivers and motor park attendants in Lagos, Nigeria, found that more than two-thirds (74.3%) of the men had multiple sex partners and many of them had had STI at one time or another.[31] In the present study, having premarital sex was not only significantly associated with STI, but it was found to be a strong predictor of STI. A higher proportion of subjects that had extramarital sex had STI compared to subjects who had no extramarital sex in this study. Those who had premarital or extramarital sex are more likely to have started sexual intercourse early and hence more likely to have multiple or casual sexual partners and less likely to use condoms consistently.[32]

First intercourse before or at 21 years of age was significantly associated with STI in this study. Zelee et al[5] observed that the age at sexual debut was an important predictor of extramarital relationships. Mostafa and Roshdy[6] also stated that in communities where it is relatively acceptable for women to have extramarital partners, there is a strong association between early coitarche and the acquisition of genital infections. Adih and Alexander[33] observed that an earlier age of coitarche is likely to lead to an increased lifetime number of sexual partners, a lower probability of

using modern contraceptive methods and an increased chance of infection with HIV or other STI. The likelihood of having multiple sexual partners was found to be influenced by early age of coitarche, which in turn was associated with premarital and/or extramarital sex. A past history of STI has been reported to be significantly associated with future or current acquisition of STIs.[7,34] Past STI was a significant predictor of current STI in this study. Fortenberry et al[34] noted that STI frequently followed a previous STI.

Singles are said to be at increased risk of STI compared to married people.[35] In this study, being unmarried was not associated with STI. Even when the widowed, separated and divorced were classified as currently unmarried based on high-risk sexual behaviour to satisfy sexual desire,[35] no significant relationship with STI was found. The age at marriage had no association with STI in this study. In contrast, Mostafa and Roshdy[6] found a significant association between genital infections and later age at marriage.

In this study, a significant association was found between STI and previous sex with commercial sex workers, in keeping with the finding of high prevalence of STIs among commercial sex workers reported in the literature.[6,8,34] This finding is not unexpected as commercial sex workers survive on their ability to acquire multiple sex partners. In particular, women who are married to men who visited commercial sex workers are at high risk.[27–29] In this study, a higher proportion of subjects who used condoms inconsistently had STI compared to subjects who used condoms consistently. Regular condom use had been found to greatly reduce the risk of STI transmission.[2,36] The WHO,[37] recognising this, makes increased condom use an important goal for those working in the area of STI prevention. Knodel and Pramualratana[38] suggest that temporary use of condoms can be helpful in preventing the spread of STI but only consistent long-term use can be effective against the transmission of HIV.

STIs have been recognised as independent risk factors for the acquisition of HIV.[6,23] Both ulcerative and non-ulcerative STIs have been found to increase the risk of sexual spread of HIV. In this study the frequencies are low: the proportion of HIV infection among subjects with STI was more than double that of the controls. This suggests an increased risk of HIV infection among people with STI, in agreement with the WHO[37] that there is a strong correlation between the spread of conventional STIs and HIV transmission. A similar finding was reported by Kehinde and Lawoyin,[4] who found a high STI/HIV co-infection rate of 30%. A lower STI/HIV co-infection rate of 17.9% was found in this study. The higher co-infection rate in the study done by Kehinde and Lawoyin was found in an STI clinic noted for high prevalence of STI. This finding further highlights the need for consistent use of condoms. It is based on this consideration that UNAIDS uses the rate of condom use with non-regular partners as one of the key prevention indicators to monitor the progress of HIV control programmes.[2] Despite a high prevalence of STIs and risky sexual behaviours in the study population, consistent condom use was abysmally low. Thus consistent use of condoms should be rigorously promoted in the study population to lower the prevalence of STI and reduce the transmission of HIV in particular.

In conclusion, this study has shown a relatively high prevalence of STIs. Previous history of STI, multiple sexual partners, transactional sex, coitarche by age 21 and premarital sex were found to be associated with STI in this study. The control measures for STI should target these risky sexual behaviours in the study community and similar communities. Targeting high-risk individuals such as commercial sex workers, their clients and adolescents is an important STI control strategy. The finding of a high proportion of subjects with co-infection of HIV/STI in this study further indicates the need for appropriate and acceptable control programmes. In view of the fact that STIs and sexual behaviours have been found to be independently associated with HIV transmission, there is a great need for effective control of STIs to reduce HIV transmission. Focused health education and proper counselling to change risky sexual behaviours constitute important STI control measures in addition to early recognition and prompt and adequate treatment. The GP has an important role to play in all three these STI control strategies.

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Declarations

Authors' contributions: SSO and EAA-K designed the study protocol; SSO carried out the clinical assessment; SSO and EAA-K carried out the analysis and interpretation of data; SSO, EAA-K and OOO drafted the manuscript. All authors read and approved the final manuscript. SSO and EAA-K are guarantors of the paper.

Ethics approval: Ethical clearance was provided by the Ethics Committee of the Obafemi Awolowo University Teaching Hospitals' Complex, Ile-Ife, Nigeria. Free and informed consent was obtained from patients included in this study.

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