

Original Article

Prevalence of and Factors Associated with Sexually Transmitted Infections amongst Patients Attending a Primary Healthcare Facility in Mthatha, Eastern Cape

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ABSTRACT

Background: Sexually Transmitted Infections (STIs) can result in serious complications including infertility, tubal pregnancy, chronic pelvic pain, and cervical cancer associated with numerous socio-economic consequences. The study sought to determine the prevalence of STIs and associated factors. **Methods:** The study was conducted among patients attending a primary healthcare clinic in Mthatha, South Africa. A total of 103 patients were enrolled between April and June 2012 during a descriptive cross-sectional study. Major STI syndromes were determined using a standardized questionnaire. Factors associated with STIs were determined by multiple logistic regression analysis using SPSS® version 21 (Chicago IL, USA). **Results:** Of the 103 respondents, 47 (45.6%) reported of having an active STI of which 24 (51%) had vaginal discharge syndrome, 10 (21.3%) had male urethritis syndrome, 10 (21.3%) had genital ulcer syndrome, and 3 (6.4%) had multiple STIs. Current employment ($P = 0.001$), age of sexual debut ($P = 0.05$), source of sexual education ($P = 0.038$), recent history of STI episode ($P = 0.012$) were significantly associated with STIs. After adjusting for univariate confounders, patients who did not complete their course of antibiotics during a recent history of STI episode had 2-fold higher risk of developing a current episode of active STI [$\chi^2 = 4.763$; OR=1.6 (1.04 –2.5); $P = 0.029$]. **Conclusion:** Non-compliance with antimicrobial agents was significantly associated with a possible recurrent STI clinical syndrome.

Keywords: Prevalence, factors, sexually transmitted infections

RÉSUMÉ

Contexte : Les infections sexuellement transmissibles (IST) peuvent entraîner des complications sérieuses incluant l'infertilité, des grossesses tubaires, des douleurs pelviennes chroniques, des cancers du col de l'utérus ainsi que de nombreuses conséquences socioéconomiques. Cette étude vise à déterminer la prévalence des IST et ses facteurs associés. **Méthodologie :** Cette étude a été menée auprès de patients fréquentant une clinique en soins de santé primaires située à Mthatha en Afrique du Sud. Un total de 103 patients ont participé à cette étude descriptive transversale menée entre avril et juin 2012. Les principales IST ont été déterminées à l'aide d'un questionnaire normalisé. Les facteurs associés aux IST ont été déterminés par une analyse de régression multiple et logistique à l'aide de la version 21 de SPSS® (Chicago, IL, États-Unis). **Résultats :** Parmi les 103 participants, 47(45.6%) ont déclaré avoir une IST active dont 24 (51%) avaient des pertes vaginales, 10 (21.3%) avaient une urétrite masculine, 10 (21.3%) avaient un ulcère génital et 3 (6.4%) avait des IST multiples. L'emploi actuel ($P=0.001$), l'âge des premières relations sexuelles ($P=0.05$), la source de l'éducation sexuelle ($P=0.038$) et les antécédents liés à l'IST ($P=0.012$) étaient associés d'une manière considérable aux IST. Après rajustement des facteurs univariés confondants, les patients n'ayant pas complété leur traitement aux antibiotiques lors du dernier épisode de l'IST ont deux fois plus de risques de développer un épisode d'IST active [$\chi^2 = 4.763$; OR=1.6 (1.04 –2.5) ; $P = 0.029$]. **Conclusion :** Le non-respect des agents antimicrobien était associé significativement à un syndrome clinique d'IST possiblement récurrent.

Mots clés : Prévalence, facteurs, infections sexuellement transmises.

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INTRODUCTION

Sexually transmitted infections (STIs) remain a major public health problem in developing countries(1). STIs are significant cause of morbidity among adolescents with multiple consequences (2). Studies have shown that STIs, despite being frequent with high prevalence and incidence rates, can result in serious complications including infertility, tubal pregnancy, chronic pelvic pain, and cervical cancer associated with severe socio-economic consequences (3). Therefore, routine surveillance of STIs is a key priority in public health (4). With the advent of HIV/AIDS epidemic, STIs have taken on a more important role in facilitating the sexual transmission of HIV (5, 6), and therefore controlling STIs can reduce HIV transmission.

Numerous pathogens including, bacteria, viruses, fungi and parasites are known to cause STIs. World Health Organization (WHO) estimated that approximately 340 million incident cases of STIs occur every year, with 85% in non-industrialized countries (7). The approach to managing STIs in those countries is therefore based on the recognition of major clinical syndromes rather than routine laboratory diagnosis of the aetiological agent causing a particular STI. There are three major clinical syndromes – male urethritis syndrome, vaginal discharge syndrome, and genital ulcer syndrome.

However, monitoring of the prevalent STI pathogens (causing a defined STI clinical syndrome) through a surveillance system is critical in informing changes in the syndromic management packages. Johnson *et al* underlined that such surveillance can also provide an indirect measure of behavior modeling within a particular population (4). Studies that have examined some correlates of STIs among adolescents have reported that common STI-associated risk factors included early age of initiation of sexual activity, alcohol and drug use before sex, multiple sexual partners and condom availability and use (8). In most parts of sub-Saharan Africa, access to healthcare and prevention systems are still weak, therefore further information to guide effective STI preventive strategies as well as diagnostic and management policies are needed.

Hence, we aimed to determine the prevalence of STIs and associated factors among patients attending a PHC facility in Mthatha, South Africa.

MATERIALS AND METHODS

Study Design and Setting:

This is a descriptive cross-sectional study, conducted at a PHC facility in Mthatha, Eastern Cape between April and June 2012. Consecutive patients, aged 16 years and above, presented at this PHC during the study period were recruited following an informed consent. Data were

collected by trained interviewers using a standardized questionnaire. The latter collected information regarding patients' demographics (age, gender, level of education, current employment, level of income and salary), presenting symptoms, history of sexually transmitted infections (vaginal discharge syndrome, urethritis syndrome, genital ulcer syndrome or mixed clinical syndromes) within the past 3 months, selected known risk factors for STIs including prior knowledge of HIV serostatus, sexuality-related factors (age of sexual debut, use of sexual protection, type of sexual partner using protection, life orientation, type of sex education received, number of sexual partners), current presence of major STI clinical syndromes, previous knowledge of STIs including history of incomplete antibiotic therapy for the past 3 months for a specific STI.

This study questionnaire has been initially tested for validity and reliability. Validity was established by a panel of experts and following a field test that determined whether the questionnaire measured what it intended to measure, does it represent the appropriate content, was it appropriate for the study population and was the questionnaire comprehensive enough to collect the needed information. Reliability was computed after a pilot field test to indicate the accuracy of the measuring questionnaire using test-retest approach.

Patients aged <16 years, pregnant women and those who were menstruating or had visible blood from their lower genital tracts were excluded from the study.

Permission to conduct the study was obtained from both the Scientific and Ethical Committee of the Faculty of Health Sciences, Walter Sisulu University. The Ethical Clearance number issued was 015/012. Each study participant signed an informed consent.

Statistical Analysis:

Data analysis was performed using SPSS[®] statistical software version 21.0 (SPSS Inc. Chicago, IL, USA). Categorical data were expressed as proportions (percentages). Analysis of variance (ANOVA) was performed to assess differences between groups. Either Chi-square test with and without trend or Fischer's exact test was used to test the degree of association of categorical variables. Multiple logistic regression models were used to evaluate the prediction capacity of each independent variable in the occurrence of the expected outcome. Unadjusted odds ratios (ORs) were initially calculated to screen for inclusion in multivariate models; variables that exhibited at least moderate association ($P < 0.20$) with the outcome were considered for inclusion in the final models. Multivariate ORs (95% CI) were computed after adjusting for confounding univariate factors. All tests were two-sided and a P value of <0.05 was considered significant.

RESULTS

Of the 106 respondents, 47 (44.3%) reported of having an active STI syndrome of which 24 (51%) had vaginal discharge, 10 (21.3%) had male urethritis, 10 (21.3%) had genital ulcer, and 3 (6.4%) had multiple STIs as depicted in [Table 1](#).

[Tables 2a](#), [2b](#), and [2c](#) summarize univariate factors associated with STIs in the population investigated.

[Table 2a](#) showed that current employment ($P = 0.001$) and age of sexual debut < 16 years ($P = 0.05$) were significantly associated with the presence of STIs. Among tested

variables related to sexual behaviour, only source of sex education ($P = 0.038$) was significantly associated with STIs as depicted in [Table 2b](#). Participants who reported receiving sex education from school were less likely to present with STIs. [Table 2c](#) showed that recent history (< 3 months duration) of STI episode ($P = 0.012$) was significantly associated with STIs particularly among participants who reported of not completing their course of antibiotics. After adjusting for univariate confounders ([Tables 2a](#), [2b](#) and [2c](#)), patients who did not complete their course of antibiotics during a recent history of STI episode had 2-fold higher risk of developing a current episode of active STI [$\chi^2 = 4.763$; OR=1.6 (1.04 –2.5); $P = 0.029$] as depicted in [Table 3](#).

Table 1: Prevalence of STI clinical syndromes among participants reported of having active genital infections (n = 47)

Major STI clinical syndrome	n =	%
Vaginal discharge	24	51.1
Male urethritis	10	21.3
Genital ulcer	10	21.3
Multiple STIs	3	6.4

Table 2a: Comparisons of the means of variables of interest by presence of STIs (n = 47) and absence of STIs (n = 59) in the study population

Variable of interest	Presence of STI	Absence of STI	ANOVA P value
Age category (years)			0.206
16 - 24	9	25	
25 - 34	30	22	
≥ 35	8	12	
Gender			0.093
male	13	9	
female	34	50	
Level of education			0.317
primary	4	4	
high school	36	48	
tertiary	7	7	
Current employment			0.001
yes	29	16	
no	17	37	
Level of income			0.405
less than R 4000	8	8	
≥ R 4000	16	7	
Age of sexual debut (years)			0.05
< 16	21	13	
16 - 20	23	37	
> 20	2	8	

Table 2b: Comparisons of the means of variables of interest by presence of STIs (n = 47) and absence of STIs (n = 59) in the study population

Variable of interest	Presence of STI	Absence of STI	ANOVA P value
Use of sexual protection			0.383
yes	36	48	
no	9	9	
Type of sexual partner using protection			0.133
male	40	44	
female	1	5	
Life orientation			0.274
yes	24	37	
no	22	22	
Source of sex education received			0.038
school	6	16	
radio	2	3	
TV	2	7	
peers	6	5	
internet	1	0	
mixed	29	28	
Smoking			0.095
yes	10	6	
no	37	53	
Excess alcohol intake			0.478
yes	13	15	
no	33	43	
Drug abuse			0.12
yes	4	1	
no	40	54	

Table 2c: Comparisons of the means of variables of interest by presence of STIs (n = 47) and absence of STIs (n = 59) in the study population

Variable of interest	Presence of STI	Absence of STI	ANOVA P value
Previous knowledge of STIs			0.064
yes	45	52	
no	1	7	
Previous history (<3/12) of STIs			< 0.0001
yes	29	12	
no	16	41	
History of incomplete antibiotic therapy during the past 3/12 for STIs			0.012
yes	34	12	
no	5	9	
Knowledge of current HIV status			0.488
yes	27	32	
no	16	21	
Knowledge of benefits of regular pap smear testing			0.17
yes	23	29	
no	10	22	
History of pap smear done at least one			0.131
yes	14	14	
no	19	36	

Table 3: Independent determinants of STIs among the study population (n = 106)

Independent variables	Beta-coefficient	Standard error	Wald chi-square	OR 95% CI	P-value
Incomplete antibiotic therapy for recent history (<3/12) of STIs	0.333	0.148	4.763	1.6 1.044 - 2.499	0.029
Constant	2.287	0.439	34.932		< 0.0001

Adjusted for current employment, age of sexual debut, source of sex education and recent history (<3/12) of STIs.

DISCUSSION

Findings from this study confirmed that STIs remains prevalent among primary healthcare clinic attendees. The vaginal discharge syndrome was the most prevalent STI clinical syndrome followed by male urethritis and genital ulcer syndromes. Although not very common, patients with multiple STIs were observed among our study

population. However, STIs are not the only cause of vaginal discharge syndrome, particularly among women attending a primary healthcare facility. The commonest causes of vaginal discharge syndrome being bacterial vaginosis (BV) and vulvo-vaginal candidiasis (VVC) (9). It is highly evident that women with BV and VVC were misclassified as having STIs during this study in the absence of laboratory testing in order to ascertain the

aetiological agent of vaginal discharge. Furthermore, other causes associated with vaginal discharge syndrome in female patients are cervical cancer and pregnancy. Whilst history of regular screening for the presence of cervical cancer (using pap smear testing) was assessed among the female participants, all pregnant women and those who were menstruating or had visible blood from their lower genital tracts were excluded from the study.

Fitzgerald *et al* reported that over 40% of women presented with at least one STI during a study in Haiti as a prototype of the developing world (10). In another study, it was also confirmed that adolescents, especially females were particularly vulnerable to the acquisition of STI because of biological, cognitive and socio-economic factors (11).

Our study revealed that participants who are currently employed presented more with an active episode of STI as compared to those who are unemployed. Similar results were reported by Gysels *et al* who confirmed that in the developing world, men in relatively economically secure occupants such as soldiers and truck drivers tend to engage in behaviours which increase their risk of contracting STIs (12).

In a study performed among young Ghanaian women, it was reported that non-use of a barrier method was a common risk factor for STI (13), this was supported by another study in a Cameroonian youth by Suigoli *et al*, who reported that those that had never used condoms had a quadruple risk of having herpes simplex virus – type 2 (HSV-2) (14). This is also confirmed by the results of this study that 81% participants that used condoms did not have STIs. Condom use at last sexual intercourse in the study by Simon *et al*. was found to be protective against STI (15).

In this study the proportions of males that used condoms were higher than females. This is confirmed by a study in Haiti (16) that because women had little schooling and few could read or write and lacked employment they entered sexual relationships out of economic necessity and, therefore, had no power to demand their partner to use a condom.

Source of sex education received was a major factor associated with the presence of active STIs. In this study participants who received their sex education from schools and peers were less likely to develop STIs. This was also confirmed by Effrod *et al* that peers education activities were known to have a significant impact on sexual behaviour at a community level (17). The authors argued that messages were more adapted to the individual's needs. In addition, life orientation from school played a major role in preventing the occurrence of STIs.

In this study, the age of sexual debut was significantly associated with STIs. This finding was also confirmed by several studies that examined some correlates of STIs in adolescents and found out that early age of initiation of sexual activity among others was associated with the presence of STIs (8).

Lack of compliance with the use of antimicrobial agents during previous STI episodes was independently associated with increased odds for the observed current STI clinical syndromes. It has been well established that overuse or under use of antibiotics leads to the development of resistant microbial pathogens, leading to treatment failure and recurrent episodes of STIs. There are also anecdotal evidences that patients do not take the full course of their antibiotics because they tend to share their tablets with their other sexual partners who refuse to come to the clinic. This may lead to a further episode of STI due to re-infection by a partially treated partner or due to relapse following an inappropriate self-treatment.

From the clinical perspective, health care providers, especially pharmacists and medical microbiologists, the custodians of medicines need to strengthen the rational use of antibiotics. Although cost-effective strategies such as the promotion of condoms, effective drugs, and the syndromic approach to case management are in existence, there is an urgent need for research into more interventions such as behaviour change. STI control programs should be a priority to reduce the STI burden in the Eastern Cape and nursing staff in PHC facilities should emphasize to the patients on the importance of compliance to antimicrobial agents.

Other traditional STI-related factors such as smoking, excessive alcohol intake and drug use were not significantly associated with the presence of active STIs among our study population.

CONCLUSION AND LIMITATIONS

STIs remain one of the most common problems leading patients to seek medical attention at PHC level in Mthatha, Eastern Cape. Inappropriate use of antimicrobial agents during a previous STI episode was a significant factor associated with increased odds for the current episodes of STIs.

The limitations of this study involve its cross-sectional design with a small sample size. In addition, STIs were diagnosed by clinical syndromes without any microbiological aetiological confirmation. Although STIs are managed syndromically in primary healthcare facilities, healthcare workers should realise that the vaginal discharge syndrome is not always caused by STIs, and further investigation should be considered when female patients present with recurrent vaginal discharge syndrome. Other non-STIs causes of VDS such as BV and

VVC should be considered as common particularly among women attending PHC facilities.

Competing Interest:

Authors declare that they have no competing interest.

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