Prevalence and Spectrum of cervical cytological abnormalities among Brothel based sex workers in Jos, Nigeria

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Abstract

Background: Cervical cancer is the second most common cause of cancer-related death among women in sub-Saharan Africa. Female sex workers being high-risk group are more susceptible to infections with the Human Papillomavirus and thus, the development of the premalignant and malignant disease of the cervix. We therefore sought to determine the prevalence and spectrum of cervical cytological abnormalities among female sex workers in Jos, Nigeria.

Methods: A cross-sectional study was conducted among Brothel based sex workers (BBSW) aged 18years and above in Jos, Nigeria between March 2018-February 2019. Papanicolaou test technique was the screening method used to detect premalignant lesions. Data were entered and analyzed using STATA version 15.1 software.

Results: A total of 201 participants were recruited for the study. One hundred and ninety-four (194) had adequate smears and were included in the analysis. Of this 80.4% were negative for intraepithelial malignancy, while 19.6% were positive for intraepithelial malignancy and this included ASCUS (10.3%), LSIL (4.6%), HSIL (3.6%), AGUS (0.5%) and ASC-H (0.5%). Abnormal cervical cytology was seen more in participants that were single, between the ages of 24-34years, multiparous, with a previous history of sexually transmitted disease, and have greater than 2 clients/day, but all these were not statistically significant.

Conclusion: Due to the high prevalence of abnormal cervical cytology among BBSW, there is a need for them to have regular screening, follow-up, and treatment of premalignant lesions to prevent progression to frank cervical cancer.

Keywords: female sex workers, Brothel based sex workers (BBSW), Abnormal cervical cytology, cervical intraepithelial neoplasia

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Introduction

Cervical cancer is a preventable and curable disease as long as it is detected early and managed effectively. Yet it is the second cause of cancer-related mortality in women in low and middle-income countries. In 2020 more than 600 000 women were diagnosed with cervical cancer and 342 000 women died worldwide.[1] Nearly 90% of these deaths occurred in middle and low-income countries.[2] Almost all cases of cervical cancer are caused by persistent infection with oncogenic HPV infection, which is usually transmitted through sexual intercourse.[3,4]

Female sex workers are a group of women who exchange sex for money and are therefore at greater risk of HPV infection due to multiple and new sexual partners, smoking, use of alcohol, low educational and socioeconomic status, inconsistent condom use, and high prevalence of immunodeficiency syndrome.[5] Despite being a high risk and priority group for cervical cancer most of them are not regularly screened and followed up.[6,7] In 2020, the WHO adopted a global strategy for eliminating cervical cancer, through the triple pillar intervention strategy: 90% of girls to be fully vaccinated by the age of 15years, 70% of women to be screened by the age of 35years and again at 45years and 90% of women with precancer treated and 90% of women with invasive cancer managed.[8] To achieve this, high-risk population including female sex workers must be screened and treated for premalignant lesions of the cervix. In this study we determined the prevalence and spectrum of cervical cytological abnormalities among BBSW.

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Materials and Methods

Study design and study setting

A cross sectional descriptive study was carried out among brothel based sex workers **(**BBSW) in Jos North, central Nigeria over a period of one year between March 2018 -February 2019. Jos North local government area is the main commercial area and one of the 17 local government areas of the state with a well-organized brothel-based system was chosen for the study.

Study population

This included brothel-based sex workers 18years and above who consented to be part of the study. Sex workers that were not brothel-based were excluded from the study.

Sample size and sampling technique

The sample size was determined using a single proportion formula with a power of 80% and at a 95% confidence interval. The prevalence of abnormal

cervical cytology of 15% from a study done in Kenya was used.[9] To accommodate for inadequate or missed slides 10% was added, the final sample size was 187 but 201 participants were recruited for the study.

A two stage sampling technique was used. First Jos North was purposely selected because it is the main commercial area of the state. Secondly using a cluster sampling brothels were chosen.

Data collection and sample collection

Data on sociodemographic, sexual and reproductive history of the participants were collected by a trained counselor in a private area within the brothel, using interviewer administered questionnaires.

HIV test

HIV test was done for all participants using the Alere Determine HIV 1/2 Ag/Ab combo test to detect both HIV1/2 Antibodies. Reactive specimen was confirmed by trinity Biotech Unigold Recombigen HIV test. All participants who tested positive were referred for HIV treatment, care and support.

Cervical sample was collected by a female gynaecologist. Each woman was placed in dorsal position. The labia were parted with a gloved thumb and index fingers. A plastic disposable Cusco's bivalve speculum which was not lubricated with an antiseptic solution was used to visualize the cervix under bright light source. A cytobrush was used to obtain samples from the cervix and a smear was made on two pre labeled glass slides and immediately fixed in an alcohol jar containing 95% alcohol and this was later stained using the Pap Smear technique.

Interpretation of results

Pap smear results were evaluated and interpreted by two cytopathologist and classified according to the 2001 Bethesda system,[10] NILM (negative for intraepithelial lesions and malignancy) which includes inflammatory changes, organisms, atrophic changes and reactive changes; ASCUS (atypical squamous cells of undetermined significance); ASC-H (atypical squamous cells cannot exclude a high-grade squamous intraepithelial lesion); LSIL (low-grade squamous intraepithelial lesions); and HSIL (high-grade squamous intraepithelial lesions). Women with Pap smear abnormality were referred to a private facility in town for further evaluation.

Data analysis

Data was analyzed using Stata software version 15.1SE. Continuous variables were expressed as mean and standard deviation while categorical variables were expressed as percentages.

Prevalence and pattern of abnormal cervical cytology was determined. The primary outcome of interest was abnormal cervical cytology. Secondary outcomes included the sociodemographic, sexual and reproductive variables. A chi square test was done to determine the association between abnormal cervical cytology and participants sociodemographic, sexual and reproductive characteristics.

Ethical consideration

Ethical approval was obtained from the ethical committee of Jos University Teaching Hospital. Permission was obtained from brothel managers and cheerleaders and a written informed consent was obtained from each participant prior to recruitment into the study.

Results

Between March 2018 to February 2019, two hundred and one BBSW had cervical cytological screening using Papsmears technique. The smears were inadequate in 7 women and so were excluded from the analysis. Thus, 194 women with satisfactory smears were included in the final analysis.

The mean age of the women was 29.42±6.6, more than half of the women were between the ages of 24-34 years, single, consumed alcohol and had secondary level of education. Greater than 80% had a history of STI and more than 90% of the participants had more than two sexual clients per day. Only 4(2.1%) of the participants reported ever having a pap smear and prevalence of HIV was 19.6% (Table 1)

Prevalence and spectrum of cervical cytological abnormalities

Thirty eight of the women had abnormal cervical cytology giving a prevalence of 19.6%. Atypical squamous cells of undetermined significance constituted the highest class of abnormality accounting for 10.3%(n=20) of the abnormalities. This is shown in (Table 2).

The association between participants socio-demographic, sexual and reproductive characteristics was determined using chi square test and it was found that participants that were single, between the ages of 24-34years, multiparous, with a previous history of sexually transmitted infections and have greater than 2 partners/day had more cervical intra epithelial lesions but this was not statistically significant.

Table 1: Sociodemographic characteristics of brothel based sex workers in Jos Nigeria

Variables	Frequency (%)
Age(mean ±SD) 29.42±6.6	
Age group	
18-24	42(21.6)
25-34	111(57.2)
35-44	37(19.1)
≥45	4(2.1)
Parity(median IQR) 1(1,2)	
Parity group	
0	42(21.6)
1-4	146(75.3)
≥5	6(3.1)
Abortion(median IQR) 1,(0,2)	
Number of abortions	
0-3	172(88.7)
≥4	22(11.3)
Age at sexual debut(mean ±SD)16.5±2.9	
Age at sexual debut group	
<15	42(21.6)
≥15	152(78.5)
Partners/day (median IQR) 5(4,10)	
Partners/day group	
≤2	17(8.8)
>2	177(91.2)
History of previous STI	156(80.4)
Previous Pap smears	4(2.1)
Marital status	
Single	101(52.1)
Married	12(6.2)
Separated	46(23.7)
Divorced	9(4.6)
Widowed	26(13.4)
Smoking	23(37.6)
Alcohol	122(62.9)
HIV status	38(19.6)
Level of education	
None	14(7.2)
Primary	46(23.7)
Secondary	117(60.3)
Tertiary	17(8.8)

Discussion

The incidence and mortality of cervical cancer have reduced significantly in developed countries due to an organized cervical cancer screening system.[1] In low and middle income countries including Nigeria, screening are opportunistic and even with that some high risk population are less likely to be screened. In many societies female sex workers are poorly identified and due to a range of social and legal discrimination issues, they are less likely to present for regular cervical cancer screening or other routine health checkups.[6,7,11]

Table 2: Numbers and proportion of different cervical cytological findings according to the Bethesda 2001, classification

Papsmears finding	Frequency	Percentage	95% CI
NILM	156	80.4	74.2-85.4
ASCUS	20	10.3	6.7-15.4
LSIL	9	4.6	2.4-8.7
HSIL	7	3.6	1.7-7.4
AGUS	1	0.5	0.07-3.6
ASC-H	1	0.5	0.07-3.6

In this research we conducted cervical cancer screening using the Pap test. The prevalence of abnormal cervical cytology among BBSW in this study was found to be 19.6% this is comparable to findings earlier in Jos Nigeria by Sagay et al,[7] similar findings were also found in Mali[12] and Iran.[13] lower prevalence have been reported by Leung et al in Hong Kong[14] and as high as 36.1 % was reported in the Dominican republic.[15] The variations in the figures reported could be due to study specific characteristics such as age, geographical location, types of sex work either brothel or non-brothel based and type of Papsmears technique implored, either traditional or liquid based method. Sheyla et al in Dominican republic recruited both brothel and non-brothel based sex workers and used liquid based cytology rather than the traditional Papsmears technique.[15]

The most common abnormality detected was ASCUS followed by LSIL, this findings is similar to that found in Madagascar[16] and Hongkong.[17] Jia et al in China found higher prevalence of ASCUS (32.04%).[18]

Given the high prevalence of ASCUS and LSIL among BBSW there is a need to provide free or cost efficient HPV screening among this population. This will help in triaging and effectively managing those that will require follow up to prevent progression to frank cancers.

Participants that reported previous history of STI were found to have a higher prevalence of abnormal cervical cytology, this is in keeping with previous studies that found high rate of STIs among female sex workers.[19,20] This may be related to high rate of risky sexual behaviours like unprotected or inconsistent condom use, anal intercourse that makes them more vulnerable to infection.

Sagay et al[7] in Nigeria also reported high rate of infections among female sex workers especially those that douche. Douching is said to alter the normal vaginal flora by reducing the amount of lactobacillus, predisposing them to more cervical and pelvic infections.

Table 3: Association between participants characteristics and abnormal cervical cytology

Variables	Abnormal cytology(n / %)	Normal cytology (n / %)	P value
Age group			
18-24	8(4.1)	34(17.5)	0.612
25-34	19(9.8)	92(47.4)	
35-44	10(5.2)	27(13.9)	
≥45	1(0.5)	3(1.5)	
Parity group			
0	9(4.6)	33(17.0)	0.631
1-4	27(13.9)	119(61.3)	
≥5	2(1.0)	4(2.1)	
Abortion group			
0-3	33(17.0)	139(71.6)	0.694
≥4	5(2.6)	17(8.8)	
Age at sexual debut group			
<15	7(3.6)	35(18.0)	0.590
≥15	31(16.0)	121(62.4)	
Partners/day group			
≤2	4(2.1)	13(6.7)	0.668
>2	34(17.5)	143(73.7)	
History of previous STI			
No	5(2.6)	33(17.0)	0.265
Yes	33(17.0)	123(63.4)	
Previous Papsmears			
No	38(19.6)	152(78.4)	0.184
Yes	0	4(2.1)	
Marital status			
Single	20(10.3)	81(41.8)	0.662
Married	3(1.5)	9(4.6)	
Separated	6(3.1)	40(20.6)	
Divorced	2(1.0)	7(3.6)	
Widowed	7(3.6)	19(9.8)	
Smoking			
No	24(12.4)	97(50.0)	0.911
Yes	14(7.2)	59(30.4)	
Alcohol			
No	16(8.2)	56(28.9)	0.478
Yes	22(11.3)	100(51.5)	
HIV status			
No	28(14.4)	128(66.0)	0.244
Yes	10(5.2)	28(14.4)	
Level of education			
None	3(1.5)	11(5.7)	0.387
Primary	8(4.1)	38(19.6)	
Secondary	21(10.8)	96(49.5)	
Tertiary	6(3.1)	11(5.7)	

We also found that only 4(2.1%) of the participants have ever screened. This is consistent with findings among female sex workers and even in the general population.[7,21,22] Ilesanmi et al found that despite the high awareness about cervical cancer screening methods, screening was low due to poor accessibility and lack of interest and the sex workers preferred to be screened in their brothels rather than Public hospital.[21]

The limitations of this study include the fact that being a cross sectional study, we were not able to detect incident cervical abnormalities or determine the temporality of associations that were detected and there was no control population used in this study. Also a larger sample size would have increased the power of the study. There is a need for further longitudinal studies using high efficiency screening methods like HPV testing and using a larger population size in other to detect and manage premalignant lesions of the cervix among this high risk population. However, the study has some strength in that cervical smears were read by two independent cytopathologist and any discrepancies were resolved to ensure accurate diagnosis. HIV test was done for all the participants.

Conclusion

This study showed a high rate of abnormal cervical cytology among female sex workers. Female sex workers are a neglected population that deserve greater attention, because of their high risk behaviour, making them more prone to infections especially HPV infections leading to cervical abnormalities.

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