

Prevalence of Squamous Intraepithelial Lesion among Women in Kaduna State, Nigeria

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Abstract

Background: Cervical cancer is one of the most common cancers in women. Human papillomavirus (HPV) infection is the primary cause of virtually all cervical cancers. Cervical cancer typically develops from precancerous changes, squamous intraepithelial lesion (SIL) over a period of 10–20 years, in about 5%–10% HPV-infected individuals. This study was carried out to determine the prevalence and risk factors of SIL among women in Kaduna State, Nigeria. **Materials and Methods:** This study was a hospital-based and cross-sectional study that combined the use of a structured questionnaire and analysis of cervical scrapings samples obtained from 276 consenting women in Kaduna State, Nigeria. The samples were analyzed for SIL using conventional Papanicolaou smear. **Results:** The prevalence rate of 6.2% for SIL was obtained with low-grade SIL being the most common type of cervical abnormality. Sociodemographic factors associated with the development of SIL in the study were marriage type, level of education, and occupation ($P \leq 0.05$). The risk factors that were associated to the development of SIL in the study were multiple sexual partners and high parity ($P \leq 0.05$). The symptoms associated with SIL were intermenstrual bleeding, dyspareunia, and postcoital bleeding. **Conclusion:** The prevalence of SIL obtained from this study is appreciable, and this calls for the institution of awareness programs for HPV-associated cervical cancer and the implementation of a routine cervical cancer screening program in Kaduna State, Nigeria.

Keywords: Cervical cancer, human papillomavirus, Nigeria, Pap smear, uterine cervix, women

INTRODUCTION

Cervical cancer is one of the most common cancers among women, particularly in developing countries.^[1] Human papillomavirus (HPV) infection has been implicated in the development of more than 90% of cases as it causes cervical dysplasia, which if untreated, can develop into cancer.^[2] Cervical cancer typically develops from precancerous changes over 10–20 years period.^[1]

The evidence for the development of human cancer by HPV has been determined through the HPV-E6 gene product which in turn binds to the human p53 tumor suppressor protein as the initiating event.^[3] Cervical cancer is completely preventable if precancerous cell changes are detected and treated early before cervical cancer develops.^[4]

Other risk factors to cervical carcinogenesis include; low immune status, poor nutrition, tobacco smoking, high parity, prolonged use of oral contraceptives, genetic disorders, early sexual debut, uncircumcision of the male partner, and

coinfection with other sexually-transmitted agents such as HIV, herpes simplex virus type 2, and *Chlamydia trachomatis*.^[5]

Worldwide, about 751 women die from cervical cancer every day and more than 80% of these deaths come from Sub-Saharan Africa. In Nigeria, 14,000–20,000 new cases are diagnosed every year, while 9659 deaths occur every year translating to the loss of 26 women every day.^[6]

The increase in cases of mortality due to HPV-associated cervical cancer necessitates the establishment and/or reinforcement of a routine National Cervical Cancer Screening Program in Nigeria. In most states in Nigeria, Kaduna inclusive, there is still very poor awareness of the

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high prevalence of HPV-associated cervical cancer as well as cervical cancer screening services.^[7] Consequently, this study seeks to provide information on the prevalence of squamous intraepithelial lesion (SIL) in Kaduna State, and the outcome of this research will, therefore, improve the prospects on the implementation of the said cervical cancer screening program at both the state and national level.

MATERIALS AND METHODS

Study area and ethical considerations

This study was a hospital-based and cross-sectional study, and it was conducted in 3 different hospitals from the 3 senatorial zones of Kaduna State, Nigeria. Ethical Approval was obtained from the Health Research Ethics Committee of Ahmadu Bello University Teaching Hospital, Zaria, as well as from the Kaduna State Ministry of Health before the study commenced and informed consent was sorted from the respondents before sample and data collection. Structured questionnaire was used to collect sociodemographic and clinical information from consenting women.

Sample size

The prevalence rate of 18.6% from a previous study in southern Nigeria^[8] was used to determine the sample size, using the equation derived by Sarmukaddam and Garad^[9] at 95% confidence interval. Cervical scrapings samples were collected from 276 women, aged 15 years and above that were sexually active. The study population included pregnant women, nonpregnant women, and women under treatment with antiretroviral drugs all of which consented. The study excluded women who had recently (<3 years ago) screened for Pap smear who know their result whether they were under treatment or not, women diagnosed with cervical cancer or with symptoms of cervical cancer, and women who were not sexually active as well as women who did not give consent.

Sample collection and analysis

A sterile cytobrush was used to collect the exoriated cells from the squamocolumnar junction of the ecto and endocervix by a gynecologist. The cells were then smeared on a clean glass slide, fixed immediately in 95% alcohol, stained with Papanicolaou technique as described by the University of Nottingham Medical School^[10] and reported using the Bethesda Classification 2001^[11] by pathologists at the Ahmadu Bello University Teaching Hospital, Shika, Kaduna State. The samples were collected over 6 months.

Data analysis

Data were analyzed statistically using the frequency procedure of Statistical Analysis System (SAS) version 9.2 (SAS Institute Inc., North Carolina State University, USA), at 0.05 level of significance and 95% confidence interval. The relationships between variables were determined using Fisher’s exact test, and the degree of association between SIL and risk factors was quantified using odds ratio (OR).

RESULTS

Analysis of the study population by sociodemographic features revealed that most (52.9%: 146/276) of the respondents were between ages 37 and 56 years (standard deviation [SD] = ±2.082). A good number (217) of the respondents were married civil servants (142) that had attended the tertiary level of education (123), mostly from other tribes (233) aside from the three major tribes in Nigeria. Concerning their sexual and reproductive characteristics, most (47.5%: 131/276) of the respondents were multiparous women who practice monogamy (228) and had their first sexual contact at or after age 20 (189).

The result of the Pap smear [Table 1] revealed that of the 276 respondents, 17 (6.2%) had SIL. Of the 17 respondents that had abnormal Pap smear, 11.8% (2/17) had atypical squamous cells of undetermined significance (ASC-US), 76.5% had low-grade SIL (LGSIL) and 11.8% (2/17) had high-grade SIL (HGSIL). The proportion of these abnormalities is summarized in Figure 1.

Analysis of the cytology result by age [Table 2] showed that women in age group 67–76 years (SD = ±3.245) had the highest rate of occurrence of SIL (22.2%: 2/9), while the least prevalence (4.9%: 4/81) was seen in respondents within

Table 1: Prevalence of squamous intraepithelial lesion among women in Kaduna State, Nigeria

Hospital	Number screened	Number positive (%)	Number negative (%)	P
GHK	92	7 (2.5)	85 (30.8)	0.0328
BDTH	92	4 (1.4)	88 (31.9)	
ABUTH	92	6 (2.2)	86 (31.2)	
Total	276	17 (6.2)	259 (93.8)	

GHK: General Hospital Kafanchan, BDTH: Barau Dikko Teaching Hospital, Kaduna, ABUTH: Ahmadu Bello University Teaching Hospital, Zaria

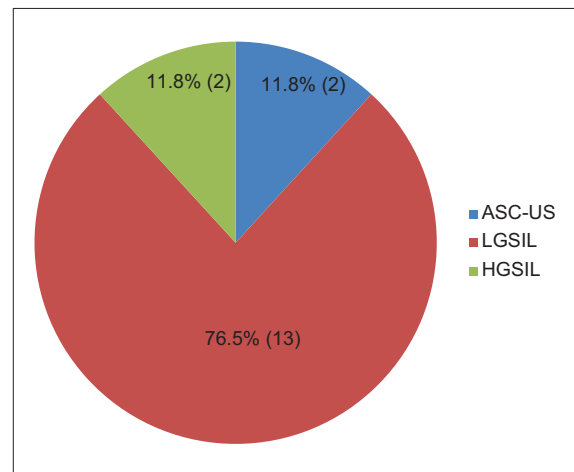


Figure 1: Distribution of squamous intraepithelial lesion among Women in Kaduna State, Nigeria (*n* = 17). ASC-US: Atypical squamous cell of undetermined significance, LGSIL: Low-grade squamous intraepithelial lesion, HGSIL: High-grade squamous intraepithelial lesion

Table 2: Prevalence of squamous intraepithelial lesion based on some sociodemographic features among women attending some hospitals in Kaduna State, Nigeria

Variable	Number analyzed	Number positive (%)	P
Age			
17-26	28	0 (0.0)	0.3107
27-36	67	5 (7.5)	
37-46	81	4 (4.9)	
47-56	65	5 (7.7)	
57-66	26	1 (3.8)	
67-76	9	2 (22.2)	
Marital status			
Single	14	0 (0.0)	0.0584
Married	217	11 (5.1)	
Divorced	3	1 (33.3)	
Widowed	39	4 (10.3)	
Separated	3	1 (33.3)	
Type of marriage			
Monogamy	228	14 (6.1)	0.0027
Polygamy	36	3 (8.3)	
Not available	12	0 (0.0)	
Highest level of education			
Primary	53	3 (5.7)	0.0512
Secondary	89	8 (9.0)	
Tertiary	123	5 (4.1)	
None	11	1 (9.1)	
Occupation			
Civil servant	142	7 (4.9)	0.0389
Business	50	4 (8.0)	
Farming	25	3 (12.0)	
Others	59	3 (5.1)	

age group 37–46 years (SD = ± 2.900) ($\chi^2 = 29.096$, df = 5, $P = 0.3107$).

SIL was not seen in the single women (ladies that had never married) that were sexually exposed, and women who were in a polygamous marriage had the highest rate of occurrence of SIL (8.3%:3/36). There was a strong statistical association between the occurrence of SIL and marriage type ($\chi^2 = 20.027$, df = 1, $P = 0.0027$).

Women who had their first sexual contact between age 13 and 16 years (SD = ± 2.434) had the highest SIL prevalence (13.6%: 3/22) [Table 3]. SIL was, however, not statistically associated with age at first sexual contact ($\chi^2 = 19.772$, df = 2, $P = 0.0424$). It was observed that women who had multiple sexual partners had a higher prevalence of SIL (9.3%: 7/75) ($\chi^2 = 19.691$, df = 1, $P = 0.0381$, OR = 0.491).

Further analysis of the results revealed that women who had given birth five times or more (grand multiparous) had the highest prevalence of SIL (8.8%: 8/91) ($\chi^2 = 19.615$, df = 3, $P = 0.0514$).

In this study, 16 women were found to be infected with HIV, out of which 1 had SIL, and there was no significant association

Table 3: Distribution of squamous intraepithelial lesion based on some sexual features and risk factors among women in Kaduna State, Nigeria

Variable	Number analyzed	Number positive (%)	P
Age at sexual debut (years)			
13-16	22	3 (13.6)	0.0424
17-19	65	0 (0.0)	
≥ 20	189	14 (7.4)	
Multiple sexual partners			
Yes	75	7 (9.3)	0.0381
No	201	10 (5.0)	
Parity			
Nulliparous	31	1 (3.2)	0.0514
Primiparous	23	0 (0.0)	
Multiparous	131	8 (6.1)	
Grand multiparous	91	8 (8.8)	
Use of oral contraceptives (years)			
1-4	50	2 (4.0)	0.3404
5-9	34	1 (2.9)	
≥ 10	34	4 (11.8)	
Never used	158	10 (6.3)	
Smoking			
Yes	4	1 (25.0)	0.4078
No	273	16 (5.9)	
Infected with HIV			
Yes	16	1 (6.3)	0.4642
No	260	16 (6.2)	
Use of sex enhancers			
Yes	11	0 (0.0)	0.4336
No	265	17 (6.4)	

between infection with HIV and HPV ($\chi^2 = 10.001$, df = 1, $P = 0.4642$, OR = 0.004). Similarly, the use of sexual enhancers was not associated with SIL ($\chi^2 = 11.331$, df = 1, $P = 0.4336$, OR = 0.000).

The prevalence of SIL based on some clinical features presented by the respondents indicated that SIL was highly associated with intermenstrual bleeding ($\chi^2 = 23.052$, df = 1, $P = 0.0031$, OR = 0.100), occurring in 11.8% (4/34) of them [Figure 2]. Furthermore, there was a higher prevalence of SIL (33.3%: 2/6) in women who had postcoital bleeding compared to those that did not (5.6%: 15/270). There was a statistically significant association between postcoital bleeding and SIL occurrence ($\chi^2 = 25.601$, df = 1, $P = 0.0046$, OR = 0.020). One of the fifteen respondents that complained of dyspareunia had SIL ($\chi^2 = 27.635$, df = 1, $P = 0.0545$, OR = 0.004).

DISCUSSION

The prevalence of abnormal smear in the study area was found to be 6.2%, which is similar to the 6.0% reported in Kano State by Auwal *et al.*^[12] and 5.7% reported in Spain.^[13] This prevalence is, however, higher than the 3.1% reported in South Italy,^[14] and much lower than 54.5% reported among women in Maiduguri.^[15] These observed differences in the prevalence

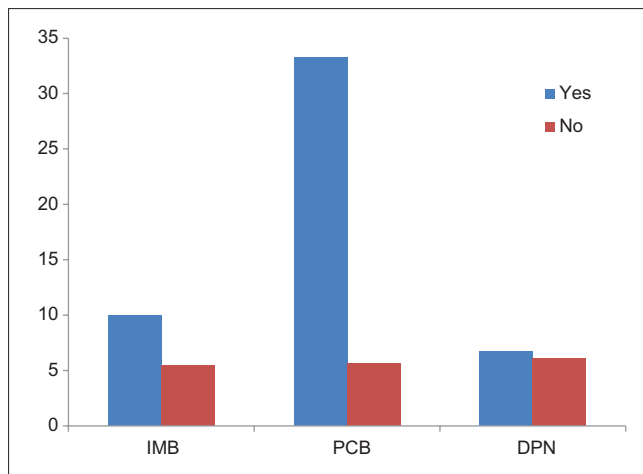


Figure 2: Distribution of squamous intraepithelial lesion based on some clinical features suggestive of cervical cancer among Women in Kaduna State, Nigeria. Key: IMB: Intermenstrual bleeding, PCB: Postcoital bleeding, DPN: Dyspareunia. Yes: Presence of any of the defined clinical features, No: Absence of any of the defined clinical features

could be due to the different sociocultural practices such as marriage practices, religious policies, diet, medical treatment options, and interpersonal relationships at the different regions as well as differences in the population studied. The 6.2% prevalence rate obtained from this implies that SIL is not uncommon in the study area and if these lesions are not treated, there is a measurable probability that they will result to cancer of the cervix in the near future. This finding necessitates the reinforcement of the Cervical Cancer Screening Program in the state and the need for women to go for this screening as frequent as required.

It was observed that LGSIL was the most common cervical lesion found in Pap smear results. This contrasts with the report of Ammatuna *et al.*^[14] It also does not agree with existing reports that say ASC-US is the most common form of cervical abnormality as reported by cytology laboratories.^[16] The higher number of women with LGSIL as compared to ASCUS could be because most of the women in this study had never done Pap smear before; therefore, the lack of discovery and treatment of the mildest cervical dysplasia (ASCUS) would have resulted to progression to LGSIL. The management of women with LGSIL largely depends on their HPV status. There is the need for immediate colposcopy and treatment in HPV-positive women who have LGSIL, as there is a 19% chance of developing HGSIL and cancer.^[17] However, HPV-negative women who have LSIL only need to do a repeat of the Pap smear 6–12 months before further actions are taken.^[17]

Older women within the age group of 67–76 years had the highest rate of occurrence of SIL. This finding is consistent with that of Fadahunsi *et al.*^[8] and Tao *et al.*^[18] but contrasted that of Rama *et al.*^[19] The high occurrence of SIL in older women could be explained by the fact that it takes a very long period (15–20 years) before infection with high-risk-HPV transforms to precancerous and later cancerous lesion.^[20] It is a

pointer to the high possibility of these set of women not going or Pap smear screening, consequently, it emphasizes the need for women, especially younger women to get involved in an active cervical cancer screening on a routine basis, this will reduce the chances of developing such lesions.

Sexual debut at a younger age and multiple sexual partners increases chances of having cervical cancer.^[21] This statement is consistent with the findings of this study, where women who had sex before the age of 16 had the highest rate of SIL. It was speculated that the increased risk of HPV is because of a biological predisposition of the immature cervix during adolescence that may be more susceptible to persistent HPV infections and therefore have a greater risk of developing SIL.^[22]

Furthermore, there was a statistically significant association between number of sexual partners and the development of SIL which implies that the more number of sexual partners one have, the higher chances are that they develop SIL in the future.^[18] It was observed in this study that women who had multiple sexual partners were 0.5 times more at risk of developing SIL than women with single sexual partner. This is in line with the report of Centre for Disease Control and Prevention.^[22]

Women who were grand multiparous had the highest prevalence of SIL compared to the nulliparous women. This finding agrees with the reports of Muñoz *et al.*^[23] and National Cancer Institute^[1] reported that women who have had multiple deliveries were at a higher risk of developing SIL. The serum concentrations of estrogen and progesterone increase as pregnancy progresses and peaks during the third trimester, and these increase may be associated with the development of an atypical transformation zone and squamous metaplasia at the endo/ectocervical junction.^[24] Having many pregnancies is, therefore, associated with an increased risk of cervical cancer.

There are certain clinical manifestations that could be indices of cervical dysplasia or possibly cervical cancer. Analysis of SIL based on these clinical features indicated that SIL was highly statistically associated with intermenstrual bleeding, postcoital bleeding, and pain during coitus, and this agrees with the findings of Tao *et al.*^[18] These symptoms have been reported as some of the clinical manifestations of cervical cancer, which supports the association that was found between the features and SIL in this study.^[1,25]

CONCLUSION

The SIL is not uncommon in the study area, thus necessitating the establishment of a routine cervical cancer screening program in Kaduna State and the need for policy formulation on cervical cancer screening. There is a need to create awareness on the risk factors for cervical cancer in Kaduna State, Nigeria.

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Conflicts of interest

There are no conflicts of interest.

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