Prevalence and risk factors of cervical cancer among women in an urban community of Kwara State, North Central Nigeria

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Key words

Prevalence • Risk factors • Cervical cancer • Nigeria

Summary

Background. *Cervical cancer is the second most common malignancy in women worldwide with a high incidence in under-developed countries and Nigeria is one of these countries. This study aimed at screening for cervical cancer using Papanicolaou smear and to identify risk factors for cervical cancer among women in Olufadi community, Kwara state, North-central Nigeria.*

Methods. *This was a cross-sectional study involving the screening of women aged 25-64 years for cervical cancer using Papanicolaou smear. Respondents were selected through systematic random sampling of households. Interviewer- administered questionnaire and clinical report form were also used to collect data. In addition, Pap smear samples were taken. Data was analyzed using SPSS version 15.*

Results. *Only 10 (5.0%) respondents had positive cytology result, while the rest were normal. Of the 10 positive cytol-ogy results, 1(10.0%) was high grade squamous intraepithelial lesion (HGSIL) while the remaining 9(90.0%) were low grade squamous intraepithelial lesion (LGSIL) which corresponds to 0.5% and 4.5% of the total respondents respectively. Risk factors for cervical cancer identified included coitarche, tobacco smoking, number of sexual partners and family history of cervical cancer.*

Conclusion. *The findings from this study attest to the increasing burden of cervical cancer. The high number of positive results obtained from the study coupled with the presence of risk factors was an indication of how useful regular screening will be in the early detection of cervical cancer.*

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Introduction

Cervical cancer is the commonest form of genital malignancy among women [1-4]. In the United States, as at 2009, estimated new cases and deaths from cervical cancer were 11,270 cases and 4,070 deaths respectively [5]. Cervical cancer is the leading malignancy in North-east Brazil where its annual incidence is 83 cases/100,000 women [6]. In Uganda, cervical cancer is the commonest cancer of women with over 80% women diagnosed in Mulago national hospital, having advanced disease [7]. Despite being considered a preventable disease, cervical cancer remains the second most common malignancy in women worldwide with a high incidence in under-developed countries such as Nigeria [8-10]. In Nigeria, the incidence rate of cervical cancer was 25/100,000 as at 2005 and over 10,000 women die of cervical cancer annually usually in a painful, miserable and undignified manners [11].

However, a significant decrease in incidence and mortality can be expected as a result of population-based screening programme [12]. A number of authors suggested a decrease in mortality by up to 80% provided that the screening programme is well organized and majority of the target population participate in it [12]. Considering the prospect of elimination of the disease by vaccination against the human papilloma virus (HPV) in the near future, at least one or two generations, screening for the disease therefore remains the most effective strategy in the control of cervical cancer [12].

Epidemiologic evidence has demonstrated that in terms of risk factors cervical cancer behaves as a sexually transmitted disease [13-15]. Studies have also consistently indicated that cervical cancer risk is strongly influenced by measures of sexual activity as seen in number of sexual partners, age at first sexual intercourse, and sexual behavior of the woman's male partner. Cervical cancer is almost always caused by HPV [16, 17]. This study therefore aimed at identifying the risk factors for cervical cancer and also screened the at-risk women between 25-64 years of age in Olufadi community for cervical cancer using Papanicolaou smear. The respondents selected were apparently healthy subjects whose HIV status were not determined or known prior to the conduct of the study.

Methodology

Olufadi is a peri-urban community located in Oke-ogun ward of the Ilorin south local government area of Kwara state in North Central Nigeria [18]. Certain socio-cultural practices that are widely practiced among the people of this community include early marriage, polygamy and associated multiple sexual partners. Housing in this community is overcrowded with concomitant poor sanitation and filthy environment, a reflection of the low socio-economic status of the people. The people are predominantly Moslems, but there are also Christians and pockets of traditional worshippers.

Olufadi health centre, which was used as the fixed post for screening the subjects did not provide Pap smear screening services. There are no trained personnel to conduct Pap smear screening in the health centre and the closest place to the community where cervical screening is available is at the University of Ilorin Teaching Hospital which is about 30 kilometers away from the community.

The study was conducted between March and August, 2011. It was a descriptive cross sectional study conducted in three stages of pre-screening, screening and post screening. In the pre-screening stage, recruitment of study subjects was done through house to house visits in the community [19]. In the screening stage, the respondents were informed about the research and health educated on the risk factors and symptoms of cervical cancer and importance of cervical screening. They completed the pretested structured questionnaire and clinical report form containing their personal information and reproductive health history. Each subject also signed or thumb-printed an informed consent form and had pelvic examination done which was documented in the clinical report form and smears were taken. In order to improve the accuracy of the result, two cervical smear samples were taken per subject. The smears taken were brought to the department of pathology, University of Ilorin Teaching Hospital where they were stained by the histopathology laboratory technicians with cytological analyses carried out by a consultant pathologist. At the post screening stage, the women with normal cytological analyses were informed to have this investigation repeated after six months and if still negative, after three years. Women with positive or suspected smears were appropriately referred.

The minimum sample size was determined using the Fisher's formula for obtaining sample size when the population is more than 10,000 [20]. A sampling frame of the households in the community was prepared through household numbering/enumeration. This revealed a total of 1,112 houses and 1,543 households in the community out of which 200 households were visited. The households visited were selected through systematic random sampling with a sampling interval of seven. For households with more than one eligible respondent, simple random sampling by balloting was used to select the respondent [20]. For households where eligible respondents were not willing to participate or where there were no eligible respondent, the next household was visited to recruit subject while maintaining the sampling interval. Each study subject was positioned on the couch in Lithotomy position and the vulva was separated to see visible lesions, mass or vaginal discharge. The cervix was then located by gentle palpation with two fingers (index and middle) of a gloved hand. The sterile vaginal speculum (Cuscos speculum) was lubricated with warm water and with the labia kept separated, the speculum was inserted. The Cuscos speculum was passed in the right direction as located by the initial palpation and it was completely inserted before opening the blades. When the cervix was clearly seen, the blades of the speculum were locked in place and the vaginal walls and cervix were inspected for any abnormality.

Cytology brush (from Cellpath) was employed to take the smears. The brush was rotated over the whole surface of the cervix, making sure that the squamo-columnar junction was well and truly scrapped. It was then smeared over the middle of a slide and fixed immediately. The brush improved the quality of the smears and reduces the number of inadequate smears. The smears were fixed while still wet because drying invariably damages the smear [3]. The smears were preserved in 95% ethyl alcohol at room temperature for onward transportation to the laboratory where it was stained [3].

The questionnaire was pre-tested in Alanamu community, another community located in Ilorin west LGA with a view to detect deficiencies or ambiguities in the questionnaire and making appropriate corrections. The acceptance of speculum examination by participants was also pre-tested. This was achieved by showing the respondents the instruments (Cuscos speculum, and the cytology brush) to be used. Each subject was then asked if they would be willing to undergo the procedure after sighting the instruments.

Trained research assistants on data collection using interviewer administered questionnaire were used. Data collation and editing was done manually to detect omission and ensure uniform coding. The analysis was done using SPSS version 15.

Ethical approval for the study was obtained from the research and ethical committee of the University of Ilorin Teaching Hospital. Anonymity and confidentiality of results of the respondents was ensured through the use of unique serial numbers for each subject. The pathology request forms bore only the initials and serial numbers of the subjects. The respondents with positive cytology result were referred to consultant gynaecologists to undergo colposcopy. All the referred respondents were properly tracked to ensure that they received the required treatment.

Tab. I. Socio-economic characteristics of respondents.

	Frequency (%) n = 200
Age group (Years)	
25- 34	56 (28.0)
35-44	49 (24.5)
45-54	40 (20.0)
55-64	55 (27.5)
Marital status	
Married	180 (90.0)
Single	3 (1.5)
Widow	17 (8.5)
Religion	
Islam	179 (89.5)
Christianity	21 (10.5)
Tribe	
Yoruba	188 (94.0)
Hausa	1 (0.5)
Igbo	2 (1.0)
Others	9 (4.5)
Level of education	
No formal education	46 (23.0)
Primary	24 (12.0)
Secondary	18 (9.0)
Tertiary	112 (56.0)
Occupation	
Trading	90 (45.0)
Civil servant	89 (44.5)
Housewife	12 (6.0)
Unemployed	7 (3.5)
Retired	2 (1.0)
Average monthly income	
< 5,000 (< 1 $/day)	46 (23.0)
5,000 (1 $/day)	14 (7.0)
> 5,000 (> 1 $/day)	140 (70.0)
Respondents' dependants	
≤ 5 dependants	134 (67.0)
> 5 dependants	66 (33.0)

Tab. II. Reproductive health characteristics of the respondents.

Variable	Frequency Percentage (%)
Age at marriage (years) n = 197	
< 17	12 (6.1)
≥ 17	185 (93.9)
Respondents' coitarche(years) n = 200	
< 17	15 (7.5)
≥ 17	185 (92.5)
Type of marriage n = 197	
Monogamous	135 (68.5)
Polygamous	62 (31.5)
Respondents' duration of marriage (years) n = 197	
1-9	64 (32.5)
10-19	41 (20.8)
20-29	27 (13.7)
30-39	30 (15.2)
≥ 40	35 (17.8)
Respondents' number of sexual partners ever had n = 200	
One	191 (95.5)
Two	9 (4.5)
Parity n = 200	
< 5	138 (69.0)
≥ 5	62 (31.0)
Use of oral contraceptives n = 200	
Yes	86 (43.0)
No	114 (57.0)
Duration of use of oral contraceptive (years) n = 86	
≤ 5	84 (97.7)
> 5	2 (2.3)
Previous genital infection among respondents n = 200	
Yes	23 (11.5)
No	177 (88.5)
Previous genital infection among male partner n = 200	
Yes	6 (3.0)
No	194 (97.0)
Male partner circumcision n = 200	
Yes	196 (98.0)
No	4 (2.0)
Circumcision among respondents n = 200	
Yes	142 (71.0)
No	58 (29.0)

Results

A total of 200 subjects participated in the research and 400 cervical smears were taken. The ages of the respondents ranged from 25-64 years with a mean of 44.17 ± 12.50. As seen in Table I, majority of the respondents, 180 (90.0%) were married while 3 (1.5%) and 17 (8.5%) were singles and widowed respectively. More than half of the respondents got married at the age of 17 years and above. The mean age of marriage among the respondents was 24.4 ± 4.4years. As shown in Table II, respondents with early sexual debut (< 17years) constituted 15 (7.5%) while 185 (92.5%) had their sexual debut after the age of 17 years. However, the mean age of coitarche among the respondents was 22.5 ± 4.6 years. Most of the respondents 191 (95.5%) had one sexual partner. The mean number of sexual partners was 1.04 ± 0.22. All the married respondents were parous.

A total of 62 (31.0%) women among the respondents were grand-multiparous (five children and above) as shown in Table II. The mean parity among the respondents was 3.7 ± 2.1.

The pattern of pre-malignant cervical lesions, as shown in Table III, revealed that 10(5.0%) respondents had positive cytology result, while 190 (95.0%) had negative cytology result. Of the 10 positive cytology result, 1 (10.0%) was high grade squamous intraepithelial lesion (HGSIL) and 9(90.0%) were low grade squamous intraepithelial lesion (LGSIL) which corresponds to 1 (0.5%) and 9 (4.5%) of the total respondents respectively. Except for those with inadequate smears which necessitated a repeat, there was no discordance in the findings obtained from the two cervical smears taken per subject. All the ten referred subjects with positive results had colposcopy done. However, only the subject with HGSIL had visible cervical lesion and biopsy was taken which revealed squamous cell carcinoma. The other nine subjects with LGSIL, though had colposcopy, had no visible lesions on the cervix. They were scheduled for a repeat Pap smear by the gynaecologists in six months and subsequently followed up.

The identified risk factors for cervical cancer among the respondents were coitarche, age at marriage, number of sexual partners, and family history of cervical cancer among others (Tab. IV). However, the regression analysis, as seen in Table V, showed that coitarche (β = 0.300), tobacco smoking (β = 0.100), number of sexual partners (β = 0.650) and family history of cervical cancer (β = 0.100) were significant predictors of risk for cervical cancer with p values of 0.002, 0.001, 0.02 and 0.01 respectively. Of these four significant predictors of risk and indeed of all the risk factors for cervical cancer, number of sexual partners had the highest regression coefficient.

Discussion

World Health Organization has stated that the likely pattern of cervical lesions expected in a previously unscreened population of women aged 25-65 years are: LGSIL (low grade squamous intraepithelial lesion): 3-10%; HGSIL (high grade squamous intraepithelial lesion):1-5%; and invasive cervical cancer: 0.2-0.5% [21]. This was similar to the 5% prevalence obtained in this study with 0.5% HGSIL and 4.5% LGSIL. Population-based screening for cervical cancer needs to be explored as a veritable tool for assessing the burden of cervical cancer in Nigeria. A number of people at the community level tend to take good health for granted [22]. Worse still, cervical cancer is a chronic condition that initially manifests as minor symptoms which may not be noticed or even neglected. Besides, by the time cervical cancer is clinically obvious, all therapeutic interventions will only produce only slight improvement in the prognosis. Consequently, carefully planned community-based screening programme is one strategy to help solve the problem.

Population-based screening for cervical cancer enhances the assessment of the burden of cervical cancer at the community level. A number of the women at the community are disadvantaged financially and geographically at accessing health care and this can be circumvented by setting up cervical screening services close to where they live or work. Essentially, this helps to direct all efforts towards the prevention rather than cure of cervical cancer.

The study by Aydin et al. in Antalya, Turkey on community-based screening for cervical cancer obtained a prevalence of 9.4% [19]. Another study conducted in a rural Muslim community in India obtained no evidence of cervical dysplasia or cervical cancer among the 270 screened population despite the presence of risk factors like early marriage, early onset of sexual

Tab. III. Cytology (Pap smear) results of the respondents.

	Frequency Percentage (%)
Cytology results	
Positive	10(5.0)
Negative	190(95.0)
Total	**200(100.0)**
Pattern of cytology results among positive respondents	
High grade squamous intraepithelial lesion	1(10.0)
Low grade squamous intraepithelial lesion	9(90.0)
Total	**10(100.0)**
Pattern of cytology results among negative respondents	
Negative with atrophic changes	13(6.8)
Negative with menopausal changes	6(3.2)
Negative with inflammation	13(6.8)
Negative (NSIL)	158(83.2)
Total	**190(100.0)**

Tab. IV. Risk factors for cervical cancer among the respondents.

	Cervical cytology						
	Positive (%)	Negative(%)	$\chi 2$	df	OR*	95% CI	p value
Marital status							
Not married	0 (0.0)	3 (100.0)					
Ever married	10 (5.1)	187 (94.9)	0.16	1	0.00	0.00-49.26	1.00 Fisher's exact
Type of marriage							
Monogamous	7 (5.2)	128 (94.8)					
Polygamous	3 (4.8)	59 (95.2)	0.01	1	1.08	0.24-5.46	1.00 Fisher's exact
Coitarche (Years)							
< 17	4 (26.7)	11 (73.3)					
≥ 17	6 (3.2)	179 (96.8)	16.03	1	10.85	2.17-53.50	0.0034 Fisher's exact
Age at marriage (years)							
< 17	4 (23.5)	13(76.5)					
≥ 17	6 (3.3)	174(96.7)	13.15	1	8.92	1.82-42.68	0.0059 Fisher's exact
Duration of Marriage(years)							
< 10	5 (6.9)	67(93.1)					
≥ 10	5 (3.9)	123 (96.1)	0.90	1	1.84	0.44-7.64	0.50 Fisher's exact
Religion							
Islam	9 (5.0)	170 (95.0)					
Christianity	1 (4.8)	20 (95.2)	0.23	1	1.06	0.12-23.45	1.000 Fisher's exact
Age (years)							
25-44	6 (5.7)	99 (94.3)					
45-64	4 (4.2)	91 (95.8)	0.03	1	1.38	0.33-6.04	0.75 Fisher's exact
Average monthly Income(₦)							
≤ 5,000 (< 1 $/day)	8 (13.3)	52 (86.7)					
> 5,000 (> 1 $/day)	2 (1.4)	138 (98.6)	12.53	1	10.62	1.99-75.03	0.001 Fisher's exact
Tobacco smoking							
Yes	1 (100.0)	0 (0.0)					
No	9 (4.5)	190 (95.5)	4.29	1	0	0.00-0.00	0.038 Yates'
Parity							
< 5 children	3 (2.2)	135 (97.8)					
≥ 5 children	7 (11.3)	55 (88.7)	7.49	1	0.17	0.03-0.79	0.01 Fisher's exact
Variable							
Number of sexual partners							
1	7(3.7)	184(96.3)					
2	3(33.3)	6(66.7)	15.93	1	0.08	0.01-0.48	0.006 Fisher's exact
Duration of use of OCP (years)							
≤ 5	1(1.2)	83(98.8)					
> 5	2(100.0)	0(0.0)	31.1	1	0.00	0.00-0.11	0.00082 Fisher's exact
Female circumcision							
Yes	6(4.2)	136(95.8)					
No	4(6.9)	54(93.1)	0.18	1	0.60	0.14-2.63	0.67
Male partner's circumcision							
Yes	8(4.1)	188(95.9)					
No	2(50.0)	2(50.0)	9.08	1	0.04	0.00-0.50	0.0026
Previous genitalinfection							
Yes	2(8.7)	21(91.3)					
No	8(4.5)	169(95.5)	0.13	1	2.01	0.27-11.36	0.72
Family history ofcervical cancer							
Yes	1(100.0)	0(0.0)					
No	9(4.5)	190(95.5)	4.29	1	0	0.00-0.00	0.038

*Odds Ratio

Tab. V. Regression analysis showing the significant risk factors for cervical cancer.

Variables	Regression coefficients, β	p value
Age	0.001	0.676
Coitarche	0.300	0.002
Age at marriage	0.300	0.580
Parity	0.130	0.605
Oral contraceptive use	0.230	0.780
Tobacco smoking	0.100	0.001
Socio-economic status	0.030	0.654
Male circumcision	0.060	0.150
Number of sexual partners	0.650	0.020
Family history	0.100	0.010
Previous genital infection	0.020	0.720
Type of marriage	0.020	0.991
Duration of marriage	0.520	0.936
Female circumcision	0.060	0.150

activity and grand-multiparity. This gave credence to the fact that socio-cultural factors like absence of promiscuity and the practice of male circumcision play an important role in the low prevalence of cervical cancer [23]. A similar study by Sharma et al. also in India on community-based cervical cancer screening program using Pap smear among women of Delhi obtained 4.67% for carcinoma-in-situ and 1.4% had high grade malignancy [24]. However, 7.9% showed atrophic endometrium and 41.1% had benign inflammatory changes [24].

The findings from this study showed that the mean age of marriage among the respondents was 24 ± 4.4years while that of coitarche was 22.5 ± 4.6 years. The respondents in this study attained coitarche before marriage with early exposure to sex and indeed sexually transmitted infections like the HPV which is a risk factor for cervical cancer. In addition, early initiation of sex before marriage is more likely to result into having multiple sexual partners with attendant non-use of condom leading to the contract of sexually transmitted infections. This will lead to early initiation of cancerous changes in the cervix.

A statistically significant association was found in this study between the respondents' age at marriage and coitarche and the development of cervical cancer. This agreed with another study in Enugu, Nigeria by Chukwuali et al. in which all the women with positive smears were or had been coitally active [25]. The result was also in concordance with that of the case-control study in Iran which identified age at first coitus or marriage of less than 15years as being significantly associated with cervical cancer [26]. Early marriage before the age of 17 years could be associated with unprotected sexual exposure, which is often with an older partner who, by his age, has an increased risk of harbouring sexually transmitted infections. Additionally, early marriage hinders or restricts social and geographic mobility limiting access to health information and schooling.

The findings from this study also revealed a statistically significant association between number of sexual partners and positive cervical smear. Overlapping or concurrent multiple sexual partners, as seen in polygamous marriage, is also a risk factor for cervical cancer as there is increased risk of sexually transmitted infections. Even though it is a risk factor for cervical cancer, it suffices to mention that marital fidelity among the actors in the polygamous marriage is a factor to consider as it lessens the chance of transmission of genital infections.

Other risk factors for cervical cancer identified in this study included parity, use of oral contraceptives and low socio-economic status. Others are tobacco smoking, family history of cervical cancer and male partner's circumcision.

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