

Cervical Cancer Trend and Associated Risk Factors at a North-Western Nigerian Hospital

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Abstract

Cervical cancer with a high prevalence in Northern Nigeria has persisted as a common cause of death in women. A retrospective study was carried out to observe the trend and associated risk factors of cervical cancer, from 2005 - 2014 at a tertiary hospital in Northern Nigeria. Pro-forma was used to collate information from medical records. Analysis with SPSS version 16 reduced data to tables, charts and percentages. P-values ≤ 0.050 were considered significant for Chi-square analysis. The trend was a normal distribution with peaks in 2008 (129/607) and dominated by squamous carcinoma (71%). More of the CC cases (40.8%) were presented at stage III. Most of the women were married (98%), in polygamy (46.6%), practicing Islam (62.2%) and majorly unemployed (70.2%). Cervical cancer cases were more among women of age-group 45 - 54 years (31.8%), first sexual debut at 15 - 19 years (30.8%), parity of 6 - 10 (48.9%) and with > 3 children (45.3%). The trend of cervical cancer in this study was found to be associated with the socio-economic status of the women, late presentation and early child birth ($p \leq 0.050$). Aging, high sexual activities in marriage, life style practices, environmental factors, low awareness of the disease and pap smear testing, were observed to be contributory factors, as only 3.5% of the women had a Pap smear test done during presentation, while none of the women had an HPV vaccine record. Public health prevention and control efforts such as increasing awareness of the cancer among women and making HPV vaccines and cervical screening services available and affordable, should be prioritized in curbing high incidences of cervical cancer in Northern Nigeria.

Keywords: Cervical Cancer; Risk Factors; Pap Smear; HPV (Human Papilloma Virus); Trend

Abbreviations

CC: Cervical Cancer; HPV: Human Papilloma Virus; HIV: Human Immunodeficiency Virus; STIs: Sexually Transmitted Infections; AAFSI: Age/s at First Sexual Intercourse; AAFCB: Age/s at First Child Birth; AALCB: Age/s at Last Child Birth

Introduction

Cervical cancer (CC) is a common cancer of the female genital tract and leading cause of death in women of all ages in developing countries [1,2]. Malignant transformations of normal tissues are caused by the development of genetic alterations that disrupt cell growth, and these alterations lead to activation of oncogenes and the inhibition of tumor suppressor genes, resulting in uncontrolled cell growth [3,4].

It is a slow growing tumour which may be asymptomatic for a period of time [3]. CC is diagnosed by histological examination of a biopsy specimen, detected by either conventional Pap smear or liquid based cytology. Precancerous changes in cervical cells can be identified and treated, to prevent abnormal changes and development of cancer [3-5].

Approximately 80 - 90% of CC cases are squamous cell carcinoma and the rest are mostly adenocarcinoma [3]. Human Papilloma Virus (HPV) infection is an aetiological factor in > 90% of CC cases [4,5]. Several strains of HPV are responsible, but serotypes 16 and 18 account for 70% of cases worldwide [6]. Human Papilloma Virus transmitted mainly by sexual contact is a well-established cause [6,7], however, associated risk factors such as Human Immunodeficiency Virus (HIV), smoking, use of contraceptives, high parity, multiple sex partners, advancement in age, STIs, early sexual activity, weakened immune system, environment and lifestyle increases one's chances of developing CC [3,7-9]. Maintaining good nutrition, healthy lifestyle, regular pap smears, cervical screening and vaccination against HPV are preventive measures for cervical cancer, but socio-cultural, environmental and socio-economic constraints in developing countries like Nigeria make these unrealistic [1,2,9].

A global HPV prevalence of 11.7% was reported, while the prevalence in Africa was approximately 21.1%, with sub-Saharan Africa topping the list at 24% [10]. High incidences of 76% and 26.3% were also reported in the Northern and Southern parts of Nigeria respectively [11,12]. A prevalence of 42.9% was reported for HPV Immunoglobulin G antibodies in a North-western hospital, with the highest prevalence recorded among women 45 - 49 years [10] and this calls for adequate prevention and control measures. In the light of these, reviewing the trend of CC in an area where the prevalence of HPV is high and the risk factors are numerous is important, to provide data required for the prevention of HPV infection and control of CC.

Materials and Methods

Study area and design

This was a retrospective study conducted at Ahmadu Bello University Teaching Hospital (ABUTH) Shika - Zaria, a major research-based, radiotherapy and oncology centre in the Northern part of Nigeria. Data was collated with pro-forma from the medical records of women histologically diagnosed with CC and managed within 2005-2014; courtesy of the Health Information Management Unit of the hospital. Ethical approval was obtained from ABUTH Health Research Ethics Committee (ABUTH/HREC/TRG/36) to authenticate the study.

Data collation

Data collation captured socio demographic data, which included age, marital status, type of marriage, religion, tribe, state of origin, education level and occupation; clinical information (sexual behaviour and reproductive characteristics) and data on predisposing factors; which included ages at sexual debut, first child birth and last child birth, parity, number of children, histological type, stage at diagnosis, symptom duration, HPV vaccine record, use of contraceptive, HIV status, record of smoking, pap smear testing, record of practice of safe sex, family history of cancers; and doctor's remark/s.

Data analysis

Data obtained was first entered into Microsoft Excel 2010, then analyzed with SPSS (Statistical Package for Social Sciences) version 16. Results were reduced to percentages, presented in frequency distribution tables, figures and charts. The Pearson Chi square test was employed to determine relationships. P values ≤ 0.050 at 95% confidence interval was considered significant for parameters examined.

Results and Discussion

A total of 607 cervical cancer cases were recorded between January 2005 and August 2014. The trend of the disease followed the normal distribution curve, rising consistently over the period of 2005 - 2008, peaking in 2008 (129/607), and then decreased consistently from 2009 - 2014 (Figure 1).

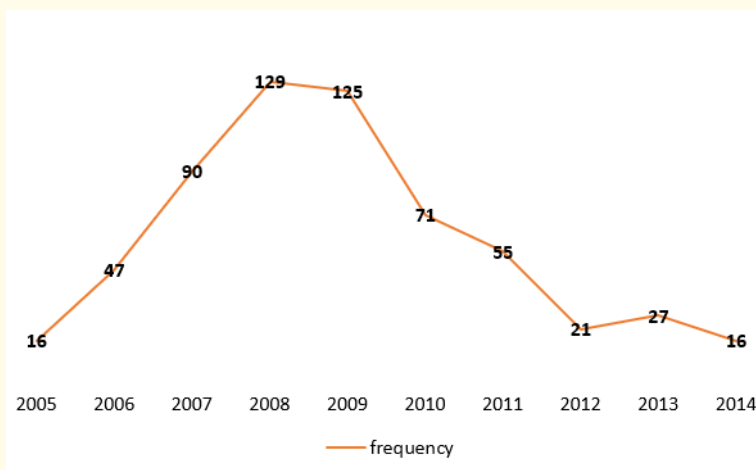


Figure 1: Trend of cervical cancer at ABUTH Shika, Zaria: 2005 - 2014.

The trend observed was similar to that reported for a major South-eastern hospital in Nigeria, for 2007-2009, where the highest number of cases were also presented in 2008 [11]. The trend in this study was found to be associated with referrals (p = 0.047), occupational status (p = 0.000), AAFCB (p = 0.001), histological type of CC (p = 0.020), symptom duration (p = 0.027) and stage of diagnosis (p = 0.001).

About 68.4% (415/607) of the CC cases were referred from varying hospitals, clinics and health centers from far and near in Nigeria, for proper treatment and management. A total of 71% (427/607) of the CC cases were squamous cell carcinoma, thus, the most common type of cervical cancer (Figure 2). Majority of the cases being squamous cell carcinoma in this study agrees with previous studies [2,9].

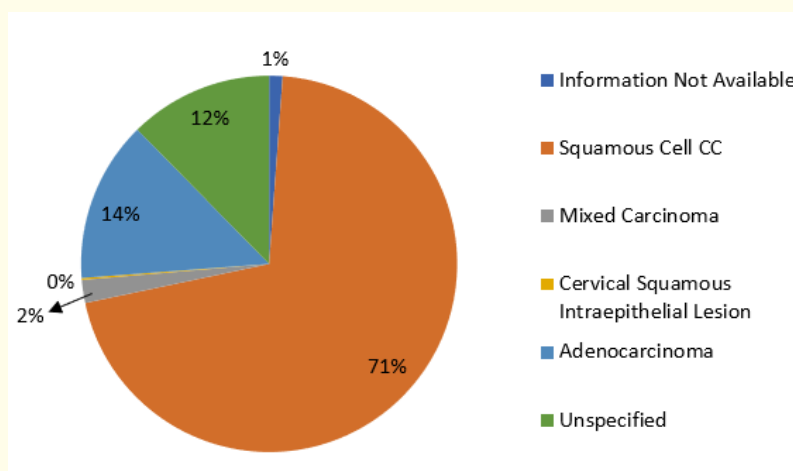


Figure 2: Cervical cancer types at ABUTH Shika, Zaria: 2005 - 2014.

The states of origin of the 607 women in this study gave a good representation of Nigeria. Data covered 33 of the 36 states in Nigeria, with majority of the cases recorded in women from tribes of Kaduna state (119/607) (Figure 3). Having majority of cases reported among women from Kaduna State, was probably because the hospital is situated in the State.

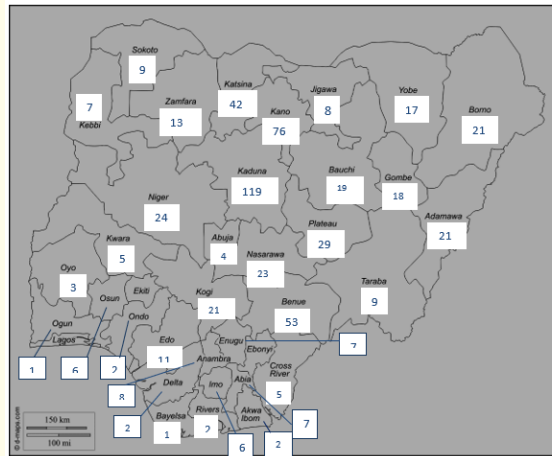


Figure 3: Cervical cancer cases and states of origin at ABUTH Shika, Zaria: 2005 - 2014.

A total of 102 tribes were represented, with majority (40%: 243/607) of the cases among the Hausa speaking tribe of Nigeria (Figure 4). Also, 62.6% (380/607) of the women practiced Islam, 36.4% (221/607) practiced Christianity, while 1% of data on religion was unavailable. Finding majority of the cases among Hausa women who practiced Islam, may have been because this tribe and religion are predominant in the study area. Socio-cultural practices and beliefs such as the use of local contraceptive and vaginal inserts (popularly known as ‘kayan mata’) for sexual enhancement, low level of awareness and low financial status, may have also contributed to the high number of cases found among this category of women, as majority of the women were unemployed house wives, likely of a low level of education. Other factors that might have predisposed women of this tribe and religion to CC, include environmental factors, genetic factors, lack of access to proper health care, religious and/or socio-cultural practices such as early marriage and sexual debut, multiple marriages and polygamy; just as studies in Kano, Northern Nigeria, associated the high prevalence of high-risk HPV types 16 and 18 among women to illiteracy, attaining menarche early, being very young at first sexual contact, multiple sex partners, and living in rural areas of the state [12]. Studies from Zaria, Northern Nigeria, also related the high rate of CC to detrimental socio-cultural practices and early onset of sexual activity [9].

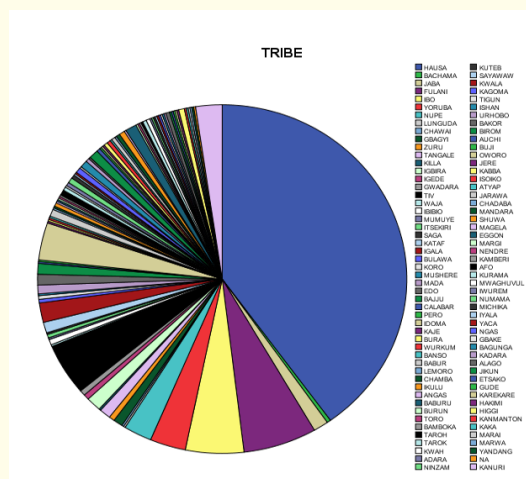


Figure 4: Pictorial representation of the 102 tribes of women histologically diagnosed with CC at ABUTH Shika, Zaria: 2005 - 2014.

Table 1 gives the frequency distribution of the socio demographic data of the women. Expectedly, 98.1% (595/607) of the women were married or had been married, hence, were actively engaged in sexual activity. Majority of the women (70.2%: 426/607) were unemployed, mostly in polygamy (46.6%: 283/607), and convincingly of low educational status, even though 95.3% of the data was unavailable (Table 1).

Parameter	Categories	Frequency n = 607	Percentage (%)	Total Figure and Percentage n (%)
Marital Status	Married	458	75.5	595 (98.1)
	Widowed	120	19.8	
	Divorced	11	1.8	
	Separated	6	1.0	
	Single	7	1.2	
	Record not available	5	0.8	
Type of Marriage	Polygamy	283	46.6	
	Monogamy	148	24.4	
	Record not available	176	29.0	
Educational Status	Record not available	579	95.3	
	Quranic Education	3	0.5	
	Primary Education	3	0.5	
	Secondary Education	4	0.7	
	Tertiary Education	9	1.5	
	Not Specified	2	0.3	
	No kind of education	7	1.2	
Occupation	Civil Servants	62	10.2	
	Retiree	6	1.0	
	Self Employed	105	17.3	
	Unemployed	426	70.2	
	Record not available	8	1.3	

Table 1: Socio demographic data of women histologically diagnosed with CC at ABUTH Shika, Zaria: 2005 - 2014.

The study recorded an age range of 26 - 86 years and mean of 50.24 years. Women of age group 45 - 54 years recorded more cases (31.7%:193/607) of CC (Table 2) and agrees with finding 45 - 49 years, recording the highest HPV sero-prevalence in the same study area [10]. Finding majority of the CC cases among age group 45-54 years, might be a result of changes in sexual behaviours such as high sexual activity in marriage, genetic mutations, hormonal changes or a less functional immune system especially during pregnancy, which probably increased their risk to CC, as also stated by several professional health bodies [3,7,8]. Marital status was associated with age (p = 0.005), which could mean aging in women and increased sexual activity especially in marriage increases the risk of getting the cancer.

Age Group (Years)	Frequency (No.)	Percentage (%)
25 - 34	50	8.2
35 - 44	132	21.7
45 - 54	193	31.8
55 - 64	150	24.7
65 - 74	62	10.2
75 - 84	19	3.1
≥ 85	1	0.2
Total	607	100

Table 2: Frequency distribution of cervical cancer cases by Age at ABUTH Shika, Zaria: 2005 - 2014.

Table 3 shows the frequency distribution of clinical information, including sexual behavior and reproductive characteristics recorded for the women. From available data, AAFSI ranged from 9 - 29 years, and age bracket 15 - 19 years (30.8%: 187/607) recorded more cases. In like manner, more cases fell within age bracket 15 - 19 years (10%: 61/607) at first child birth (Table 3). Ages at last child birth (AALCB) ranged from 19 - 66 years, and age bracket 30 - 39 years (36.2%: 220/607) recorded more cases (Table 3). A range of 0 - 20 and a mean of 7.28 were recorded for parity. Coincidentally, parity of 6 - 10 recorded more cases (48.9%: 297/607) (Table 3). The number of children borne by the women ranged from 0 - 15 with a mean of 4.84. The highest number of CC cases were observed among women who had 1 - 5 children (45.3%:275/607), closely followed by those who had 6 - 10 children (40.9%:248/607) (Table 3).

Women diagnosed with stage III CC were more (40.8%: 247/607) in this study. The duration of symptoms before presentation ranged from 4 days to 20 years, and more of the CC cases (20.3%: 123/607) were recorded among women who were diagnosed of CC or presented at the hospital between 5 - 8 months and closely followed by 9 - 12 months (18.5%: 112/607) (Table 3). A strong association existed between symptom duration and occupation in this study, which suggest that low financial status of the women as a result of unemployment, and poor enlightenment on the disease, were likely contributing factors to late presentation.

Parameter	Categories	Frequency n = 607	Percentage (%)
AAFSI	≤ 9	1	0.1
	10 - 14	138	22.7
	15 - 19	187	30.8
	20 - 24	24	4.0
	25 - 29	4	0.7
	Record not available	253	41.7
AAFCB	≤ 9	1	0.1
	10 - 14	16	2.6
	15 - 19	61	10.0
	20 - 24	37	6.1
	25 - 29	6	1.0
	30 - 34	1	0.2
	Record not available	485	80.0
AALCB	< = 19	1	0.1
	20-29	93	15.5
	30-39	220	36.2
	40-49	114	18.8
	50-59	14	2.3
	60-69	2	0.3
	Record not available	163	26.9
Parity	0	8	1.3
	1 - 5	127	20.9
	6 - 10	297	48.9

	11 - 15	121	19.9
	16 - 20	8	1.3
	Record not available	46	7.6
Number of Children	0	13	2.2
	1 - 5	275	45.3
	6 - 10	248	40.9
	11 - 15	10	1.6
	Record not available	61	10.0
Stage of Cancer	I, IA and I B	24	3.9
	II, II A and II B	156	25.7
	III, III A and III B	247	40.8
	IV, IV A and IV B	78	12.9
	Record not Available	102	16.8
Symptom Duration	< 1 Month	5	0.8
	1 - 4 Months	94	15.5
	5 - 8 Months	123	20.3
	9 - 12 Months	112	18.5
	> 1 Year	91	15.0
	> 2 Years	47	7.7
	Record not available	135	22.2

Table 3: Clinical information of cervical cancer cases at ABUTH Shika, Zaria: 2005 - 2014.

The CC cases found among women who had sexual debut at 15 - 19 years, and first child birth at 15 - 19 years (Table 3), fell within HPV vaccine ages, however, none of the women had HPV vaccination history. This was probably due to poor awareness of the disease, and/or unavailability of the vaccines until 2009, as more of CC cases were reported in 2008. Even when the vaccine was introduced, the cost was as high as ₦ 25,000 and majority of the women could not have afforded it. This could have also been responsible for the association between the trend of the cancer and late presentation ($p = 0.027$), also resulting in an association of the trend with advanced stages of the cancer ($p = 0.001$).

The frequency distribution of the recorded predisposing factors for CC is shown in table 4.

Parameter	Categories	Frequency (No.)	Percentage (%)
Use of Contraceptives	Yes	102	16.8
	No	280	46.1
	Record Not Available	225	37.1
HIV Infection	Positive	49	8.1
	Negative	114	18.8
	Record Not Available	444	73.1
Smoking	Yes	28	4.6
	No	437	72.0
	Record Not Available	142	23.4
Practice of Safe Sex	Yes	103	17.0
	No	149	24.5
	Record Not Available	355	58.5
Family History of Cancer	Yes	22	3.6
	None	348	57.3
	Record Not Available	237	39.0
Pap Smear Test	Yes	21	3.5
	No	144	23.7
	Record Not Available	442	72.8

Table 4: Frequency distribution of predisposing factors among CC cases at ABUTH, Zaria: 2005 - 2014.

From record available, more of women with CC were not practicing safe sex (24.5%:149/607), either as a result of multiple marriages, unprotected sex or multiple sex partners, and more of these women (23.7%:144/607) never had a pap smear done prior to presentation (Table 4). Similarly, more of the CC cases did not agree to use of contraceptives (46.1%:280/607) or smoking (72%:437/607) and did not have a family history of cancer (57.3%:348/607) (Table 4). More of the women diagnosed with CC in this study were equally negative for HIV infection (18.8%:144/607) (Table 4).

Low pap smear testing relative to ignorance, absence of screening centers, perceived non necessity, faith in God, prohibitive cost and physician’s non recommendation were reported in Makurdi, Middle Belt region of Nigeria [13-15]; just as poor knowledge and negative attitude to the utilization of cervical cytology service in Port Harcourt, South-eastern Nigeria, was associated with strong cultural and religious reasons [11]. Lack of Pap smear testing and cervical screening are likely reasons early diagnosis and management of CC cases in this study was impossible, increasing their risk of developing advanced stages of the cancer. In addition, only 3.5% of the women had a Pap smear done, while many probably never heard of it. The few women who did a Pap smear, did it at the point of being diagnosed and/ or prior to being referred for further management.

Studies in 2008 from South-western Nigeria, confirmed the knowledge of cervical cancer among Nigerian women to be low and utilization of screening services to be poor. The risk of contracting CC was equally attributed to first sexual intercourse, pregnancy and marriage before the age of 20 years, late presentation and high cost of screening services [1,2]. A research conducted in Zaria, North-western Nigeria, showed a good knowledge of cervical cancer screening; however, the fair attitude did not translate to good practice owing to high cost of screening [16]. Reports from Lagos, South-western Nigeria, also confirm that unavailability of HPV vaccines and its non-implementation as a routine immunization for adolescents were contributory factors to the high incidences of CC in Nigeria [17]. In order to buttress these points, none of the 607 women with CC cases in this study had the HPV vaccine.

Doctor's remark/s showed that 1% of the women were further referred, respecting the choice of the women or due to proximity for management. About 7% of the women either absconded or were discharged against medical advice, probably as a result of insufficient funds for adequate treatment or personal belief. A total of 11% were being followed and managed, while 9% were successfully managed by oral medicine, surgical operation or radiotherapy to the point of discharge. Unfortunately, 5% of the cases did not survive the disease consequences.

Smoking, use of contraceptives, family history of cancer and HIV infection listed as risk factors for CC by the American Cancer Society were not found to be possible risk factors for CC in this study [18]. This was similar to findings in Makurdi, except for HIV-1 highlighted to be a risk factor [13]. In summary, trend of CC in this study was found to be associated with socio economic status, late presentation and early child birth. Aging, socio-cultural lifestyle practices such as multiple sex partners especially in polygamy, early marriage and sexual debut, high parity and high sexual activities in marriage were possible factors that predisposed the women to CC. Environmental conditions, low awareness of the disease, low Pap smear testing, high cost of cervical screening services and unavailability of HPV vaccines were presumed as contributory factors to CC among the women.

Conclusion

Being a retrospective study, incomplete data and poor documentation were limitations to the study, so conclusions were based on available data. The downward trend observed from 2009 - 2014, might have resulted from internal factors such as strike, poor documentation, administrative changes and management policies. External factors such as the economic situation, civil crises or public awareness on the disease could also be reasons for the downward trend observed. In addition to creating awareness on HPV infection, cervical cancer and utilization of screening services, public enlightenment on its risk factors will go a long way in prevention and control, especially in Northern Nigeria where the prevalence is high. Women empowerment and HPV vaccination programs will also limit the incidence of CC. It is equally necessary to make Pap smear testing, cervical screening services and HPV vaccine readily available and affordable in combating the high prevalence of HPV infection and CC in Nigeria.

Conflict of Interest

The authors declare no financial interest, and no conflict of interest exist.

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