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Original Research Article

HISTOPATHOLOGICAL STUDY OF CERVICAL CANCER SPECIMEN AT THE UNIVERSITY OF CALABAR TEACHING HOSPITAL, CALABAR

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Abstract

Background: Cervical cancer is the second commonest malignancy in females worldwide with variation in incidence and mortality from country to country. However, there is a huge burden of the disease in sub-Saharan Africa.

Aims/Objectives: The aim of this study is to do a histopathological study of cervical cancer specimens at the University of Calabar Teaching Hospital, Calabar.

Methodology: The study design is a prevalence study on archival specimens. The cervical cancer cases diagnosed between 2009 and 2014 was identified. The paraffin-embedded tissue blocks of cervical cancer were selected. The paraffin sections were obtained for each block. The sections were stained with hematoxylin and eosin. The pathology reassessment of the histopathological diagnosis was done using the World Health Organization (WHO) classification.

Results: There was 123 sample analyzed in this study. The age range of the subjects is 31 to 75years. The median age of the subjects is 48.59±10.61. Most of the patient (97.56%) had squamous cell carcinoma while 2.44% were diagnosed with adenocarcinoma of the cervix. In all, 64.2% of the cases were diagnosed with non-keratinizing squamous cell carcinoma, 30.1% were diagnosed with keratinizing squamous cell carcinoma, 3.3% were diagnosed with basaloid squamous cell carcinoma and 2.44% were diagnosed with adenocarcinoma of the cervix.

Conclusion: Cervical cancer is a huge source of concern in our society constituting a big public health challenge. With recent advances in medical science, prevention through an organized cervical cancer screening programme and vaccination against high-risk human papillomavirus would go a long way to nip this problem on the board.

Keywords: Cancer, adenocarcinoma, prevalence, keratinizing, sections.

Introduction

Over half a million new cases of cervical cancer and an estimated 273,000 deaths from the disease are recorded every year worldwide, making it the commonest of gynaecological malignancy.[1, 2, 3] There are variations in the incidence and mortality of cervical cancer from country to country.[3] Eighty percent (80%) of the burden of this disease is in the developing countries with the women in developing countries having two to three times a higher incidence of cervical cancer and related mortality compared to those in developed countries.[3, 4, 5] Cervical cancer is the commonest cause of cancer-related death in Central America, South America, south-central Asia, west, east and central Africa.[2, 3, 5] The highest incidence of cervical cancer death has been observed in Guinea.[2] Cervical cancer can occur in females between age 18 to 80years.[6, 7, 8] The peak age of developing the disease is 44 – 49years thus causing the death of women in the most productive age of their life.[2, 9, 10 11, 12]

In sub-Saharan Africa, every year there are 34.8 new cases of cervical cancer per 100,000 persons and 33.5 per 100,000 persons die from the disease each year.[4, 13] Studies done in Nigeria show cervical cancer as the second commonest cancer in females and the commonest gynecological malignancy.[2, 6, 8, 11, 12, 14] Population-based studies done in Nigeria, in Ibadan and Abuja using data from the cancer registries from 2009 to 2010 put cervical cancer as the second commonest cancer amongst females. From this study, the age-standardized incidence rate of cervical cancer were 36 per 100,000 and 30.4 per 100,000 respectively.[8] Also, a study done across 19 cancer registries in Nigeria in 2012, comparing the prevalence of the different cancers in the different regions of Nigeria show that cervical cancer is the overall second commonest cancer in females.[6] A study done by Ekanem et al in 1992 in Calabar shows cervical carcinoma to be the commonest female genital tract malignancy.[14] Also, a study done by Omotoso et al in 2010 show that cervical cancer was the commonest gynecological malignancy in Calabar.[15] Similarly, a study done at the University of Maiduguri teaching hospital by Pindiga et al in 1999 shows that cervical cancer was the commonest female genital tract malignancy.[16] Another study by Mohammed et al in 2006 in Zaria also showed that cervical cancer was the commonest malignant tumor of the female genital tract.[17]

Studies have also shown that the burden of cervical cancer is rising in Sub Saharan Africa.[16, 18, 19]

Materials and Method

Study Design and Materials

The study design is a prevalence study on archival histopathological specimens. The cervical cancer cases diagnosed between 2009 and 2014 were identified. The paraffin-embedded tissue blocks of the cervical cancer specimens were selected. Basic information (age at diagnosis, year of diagnosis and original histopathological diagnosis) were collected from medical records.

Paraffin sections are obtained for each block. The sections are put on the slide, stained with hematoxylin and eosin. The paraffin blocks processing and the pathology reassessment of the histopathological diagnosis was done using the World Health Organization (WHO) classification.[37] The

pathology evaluation is done include diagnosis of the histological type and confirmation of adenocarcinoma using Periodic acid Schiff stain.

Sample Size

The sample size for this study consists of all histological specimens of cervical cancer seen in the UCTH between 1st of January 2009 to 31st December 2014.

Data analysis:

Data was being entered and analyzed using Epi Info7 software, with descriptive and inferential statistics employed for analysis. Frequency tables, graphs, and charts were used to display sociodemographic characteristics and prevalence of cervical cancer among subjects in the study period. Categorical variables were compared with categorical variables (such as age groups vs. histological type) using chi-square test. Alpha level of significance was set at 0.05.

Criteria for selection:

Blocks of paraffin-embedded tissue specimen diagnosed with invasive cervical carcinoma during the study period (1st January 2009 to 31st December 2014).

Exclusion criteria:

Cases in which the tissue blocks are missing and cases diagnosed by Pap smear cytology were excluded from this study. Nine specimens were excluded from this study because their blocks were missing.

Ethical consideration:

Ethical clearance for the conduct of this study was obtained from the ethical committee of the University of Calabar Teaching Hospital, Calabar.

Conflict of Interest: The author has no conflict of interest.

Results

General Findings

For the six-year study period of 1st January 2009 to 31st December 2014, one hundred and twenty-three cervical cancer specimen were analyzed of the total samples received in the department of pathology, University Of Calabar Teaching Hospital, Calabar during the study period (eight thousand three hundred and eleven). There were one hundred and ninety-six gynecological malignancy specimen received giving a cervical cancer prevalence of 62.7% among the gynecological malignancies in the center.

Socio-demographic characteristics of subjects

Table 1: Showing the age distribution of the subjects

AGE GROUP (Years)	FREQUENCY (N=123)	PERCENTAGE (%)
31-40	40	32.52
41-50	46	37.40
51-60	14	11.38
61-70	21	17.07
>70	2	1.63
MEAN AGE ± SD	48.59±10.61	

A total of 123 female subjects aged from 32 to 75 years were studied. Their mean age was 48.59 ± 10.61. Table 1 shows the age groups of subjects. Majority 86(69.9%) were aged below 51 years while the least number 2(1.6%) comprised of those aged above 70 years.

Figure 1: Prevalence of the Histological types

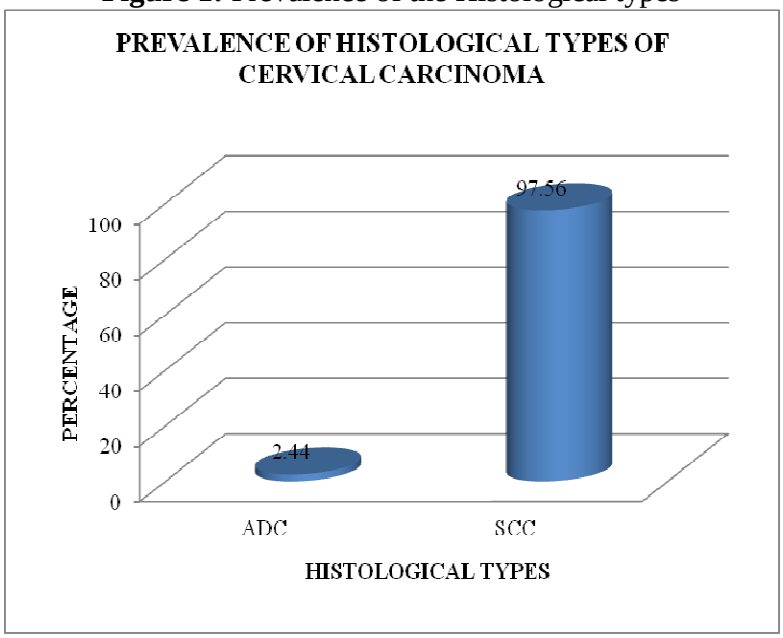
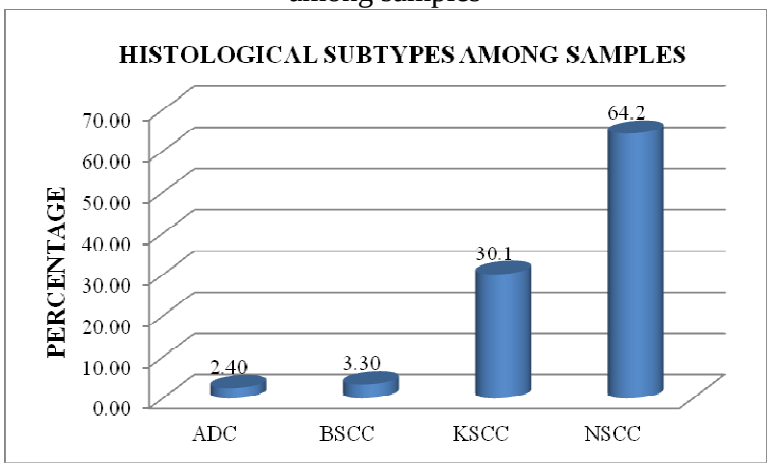


Figure 1 shows the prevalence of the major histological types of cervical carcinoma in the samples which are squamous cell carcinoma and adenocarcinoma. Squamous cell carcinoma constituted 97.56% of cases while adenocarcinoma constituted 2.44% of all the cases.

Figure 2: Prevalence of histological Subtypes of Squamous cell carcinoma and adenocarcinoma among samples



ADC = Adenocarcinoma;
BSCC = Basaloid Squamous Cell Carcinoma
KSCC = Keratinizing Squamous Cell Carcinoma;
NSCC = Non-keratinizing squamous carcinoma.

Figure 2 shows histological subtypes of squamous cell carcinoma and adenocarcinoma among samples. The commonest type amidst the subtypes was non-keratinizing squamous cell carcinoma with a prevalence of 64.2%, followed by the keratinizing type (30.1%), then basaloid squamous cell carcinoma (3.3%). The least prevalent is adenocarcinoma (2.4%).

Table 2: Relationship between histological types and age group of study subjects

	AGE GROUP			STATISTICS	
HISTOLOGICAL TYPES	**≤48(n=76) (%)**	**≥49(n=47) (%)**	**Total (N=123)**	**Chi-square**	**P-Value**
NSCC	40 (50.63)	39(49.37)	158	12.00 df = 9	0.213
KSCC	31 (83.78)	6 (16.22)	74		
BSCC	3 (50.00)	2 (50.00)	8		
ADC	3 (100)	0 (0.00)	6		

Table 2 represents the relationship between histological type and age of subjects divided according to whether they are aged above or below the mean age of study subjects. Subjects aged at most 48 years with HPV are more likely to have the adenocarcinoma histological type, followed by keratinizing squamous cell carcinoma. X^2= (9, N=123) = 12.00 *p*=0.213.

Discussion

Most cervical cancer cases result from genital infection with human papillomavirus (HPV). Well-organized programmes of regular gynecological screening and treatment of precancerous lesions have been effective in preventing cervical squamous carcinoma (the most common type) but have had less impact on adenocarcinoma. Gynaecological screening programmes are also difficult to implement in low-resource settings. However, vaccines targeted against HPV genotypes causing cervical cancer have the potential of eliminating the disease.

A total of one hundred and thirty-two cervical carcinoma specimens received in the department of pathology, University of Calabar Teaching Hospital during the six-year period were analyzed in this study and nine were excluded from the study because the tissue blocks were missing. This makes it one hundred and twenty-three specimens that were analyzed in this study. This represented 62.7% of all the specimen diagnosed of gynecological malignancy during this study period. This finding is consistent with that from a similar study by Ekanem et al, which shows a prevalence of 63%. [14] This value is, however, lower than that obtained by Pindiga et al and Mohammed et al which found a prevalence of 72.6% and 77% respectively. This difference could be due to a relatively early age marriages of females in the northern part of the country (Nigeria) associated with an early debut of sexual intercourse.[14,16,17,19]

The mean age of the women in this study is 48.5 ±10.61years which are consistent with findings in Zaria, Nigeria by Sule et al with a mean age of 47.6years, in Zimbabwe by Ndlovu et al with a mean age of 48years and other parts of the world.[20,21,22,23] The age range of the women in this study is between 32 and 75years with a peak incidence at the 41-50years age group. This age group of peak incidence is in agreement with findings in studies in Nigeria by Ekanem et al, Omotoso et al, Mohammed et al, Pindiga et al and Ijaiya et al and in other parts of Africa by Mushosho et al.[14, 15, 17,21,22,23,24,25]. These similarities could be due to the similarities in the culture/lifestyle and environmental factors in sub-Saharan Africa.

The commonest histological type of cervical cancer in this study is squamous cell carcinoma with a prevalence of 97.56% followed by adenocarcinoma with a prevalence of 2.44%. This finding is similar to that by Krennhrubec et al in Central Tunisia with a prevalence of 98% and 2% for squamous cell carcinoma and adenocarcinoma respectively.[26] The commonest subtype of squamous cell

carcinoma in this study is the nonkeratinizing squamous cell carcinoma with a prevalence of 64.2% followed by keratinizing squamous cell carcinoma with a prevalence of 30.1%, and basaloid squamous cell carcinoma with a prevalence of 3.3%. This finding is consistent with findings from previous studies in Nigeria by Omotoso et al with a prevalence of 55.2% for nonkeratinizing squamous cell carcinoma, 22.5% for keratinizing squamous cell carcinoma and 4.8% for basaloid squamous cell carcinoma.[15] The findings by Ekanem et al are similar to that of Omotoso et al.[14] A retrospective study done by Pindiga et al shows the prevalence of 92% and 5.9% for squamous cell carcinoma and adenocarcinoma of the cervix respectively which is consistent with findings from this study. This could be due to similarities in the lifestyle and environmental factors in these regions of the country where these studies were done.[16] The findings are also in agreement with findings from a pilot study in Ethiopia by Rashed et al among Ethiopian women which shows the prevalence of 35%, 15% and 5% for non-keratinized squamous cell carcinoma, keratinized squamous cell carcinoma and adenocarcinomas of the cervix respectively.[27] This finding is also consistent with the findings in other studies in Nigeria by Umuezulike et al, in Ghana by Der et al, in Zimbabwe by Mushosho et al and Ndlovu et al, China by Wu et al and in Pakistan by Badar et al and in Central Tunisia by KrennHrubec et al.[17,21,22,23,24,28,29,30] Squamous cell carcinoma of the cervix has been known to be caused predominantly by human papillomavirus (HPV) infection which is relatively common in our environment.[24,28] This high rate of HPV infection may be responsible for high prevalence of squamous cell carcinoma in our environment. The lower prevalence of adenocarcinoma could be attributed to the fact that adenocarcinoma is not caused by Human Papillomavirus alone.

From this study, seventy-seven out of one hundred and thirty-three cervical cancer specimens (61.79%) are from women whose ages are ≤ 48years. A similar finding was observed by Mohammed et al in a study in Zaria which showed that 57.98% of the cases of cervical cancer occurred in females that are ≤49years.[17] This finding is in contrast to the findings by Der et al in Ghana where 70% of the cases were of age above 50years.[30] The relationship between the age and the histologic types also show that specimens from patients below the mean age (≤48years) are more likely to have adenocarcinoma followed by keratinizing squamous cell carcinoma of the cervix. Though, this relationship was not statistically significant with p=0.213, in this study all the patients with adenocarcinoma were below the mean age. This finding is similar to that by Chan et al in China in which he found that the commonest age group with adenocarcinoma was 41-45years.[33] This age is slightly younger than that from the study by Der et al where adenocarcinoma was more common from age ≤ 59years .[26] The peak age of cervical cancer worldwide is 45years.[2] Cervical cancer is the fourth most common cancer in women worldwide and the second most common female cancer in women aged 15-44 years old worldwide.[34] This would generally explain why more women ≤48years had cervical cancer in this study.

Conclusion

Cervical cancer represented 62.7% of all gynecological malignancies at the University of Calabar Teaching Hospital, Calabar. This makes it the commonest gynecological malignancy at the University of Calabar teaching hospital representing more the half of all gynecological malignancies. This would mean that eradicating this cancer would mean

eradicating more than 50% of all gynecological malignancies presenting at the center. Public health enlightenment together with a well-organized cervical screening and human papillomavirus vaccination programme would hopefully eradicate this disease.

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