International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Index Copernicus Value (2016): 79.57 | Impact Factor (2015): 6.391

The Relationship between Age and Histological Types of Cervical Cancer

Godstime I. Irabor,[1] Edoise M. Isiwele,[2] Martin A. Nnoli,[3] Kenneth A. Omoruyi.[3]

[1]Department of Pathology, Saba University School of Medicine, Saba, Netherland

[2]Department of Surgery, University of Calabar Teaching Hospital, Calabar, Nigeria

[3]Department of Pathology, University of Calabar Teaching Hospital, Calabar, Nigeria

Abstract: ***Aim: To determine the relationship between age and histological types of cervical cancer in Calabar, Nigeria. Methodology: The study design is a prevalence study on archival specimens. The cervical cancer cases diagnosed between 2005 and 2013 were identified. Basic information (age at diagnosis, year of diagnosis and original histopathological diagnosis) was collected from medical records. The sample size for this study consists of all histological samples of cervical cancer seen in the Department of Pathology, University of Calabar Teaching Hospital, Calabar between 1st of January 2005 to 31st December 2013. The data obtained were analyzed. Results: A total of two hundred and forty-five (245) female subjects from 31 to 77 years were studied. The mean age of the subjects was 49 ± 5. Majority 160 (65.3%) of the subjects were aged below 51 years and those aged above 70 years has the highest prevalence 5 (2.5%). Subjects aged below 49 years are more likely to have keratinizing squamous cell carcinoma followed by basaloid squamous cell carcinoma histological type. The peak age of squamous cell carcinoma and adenocarcinoma is 41 – 50 years age. The peak age of keratinizing squamous cell carcinoma and non-keratinizing squamous cell carcinoma is 41-50 years. The age group with the second highest frequency for keratinizing squamous cell carcinoma is 61 -70 years and that for non-keratinizing squamous cell carcinoma is 31-40 years. The peak age of basaloid squamous cell carcinoma is 31-40 years, followed by the >70 years age group. Conclusion: Cervical cancer is common in women that are less than 50 years of age making young women a huge target at the most productive time of their life. Therefore cervical cancer in addition to being a health problem has turned out to be a big economic problem in our society.***

Keywords: Cervical, Cancer, Age, Histological, Squamous cell

1.Introduction

There are over 300,000 deaths of women yearly from cervical cancer. Most of them in the productive age of their life. This disease is a major cause both economic and health problems in our society. The most common histological type of cervical cancer is the squamous cell carcinoma and adenocarcinoma. The squamous cell carcinoma has various types including the keratinizing, non-keratinizing and basaloid types.

The aetiological agent responsible for the development of cervical cancer is the human papillomavirus (HPV) which infect immature squamous epithelial cells at the squamocolumnar junction. Ninety percent of those females infected by HPV are cleared of the infection within two years.[1] Persistent infection results in koilocytic atypia in the cervical epithelium.[2, 9] At this stage, a squamous intraepithelial lesion is said to have developed and this could be detected with regular Papanicolaou smear screening. When squamous intraepithelial lesion (high grade or low grade) is diagnosed, it is treated accordingly thus preventing the progression into invasive cervical cancer. This has been mostly responsible for the reduction in the incidence of cervical cancer in developed countries.[2, 3] Eighty percent (80%) of low grade squamous intraepithelial lesion (LSIL) and all of the high grade squamous intraepithelial lesion (HSIL) are associated with high-risk HPV infections.[1] About 40% of those with high-risk HPV infection would develop HSIL and of these, 10% would progress to invasive cervical carcinoma within a period of 10 years.[1]

Globally, cancer-related morbidity and mortality contribute significantly to the burden of disease borne by women in their reproductive ages, who play key roles in building strong families and nations.[1,4] This is especially so for cervical cancer, that is highly prevalent in developing countries, which bear over three-quarters of the global disease burden, with an annual estimate of over half a million cases. [4,5] For instance, Nigeria with an incidence rate ranging from 30.4 to 36 per 100,000 women, has one of the highest rates in the sub-Saharan African region, and the world.[6,7] Also, infection with HPV which is the key aetiologic factor, is present in at least one in every five women in Nigeria, representing one of the highest prevalent rates globally.[8,9]

There are several of Cervical carcinoma prevention and control programme which include - HPV vaccination, cytological screening and management of Pap smear abnormalities, surgical removal of precancerous lesions, cryotherapy for precancerous lesions, laser ablation therapy for precancerous lesions and hysterectomy.

2.Materials and Method

The study design is a prevalence study on archival specimens. The cervical cancer cases diagnosed between 2005 and 2013 were identified. Basic information (age at diagnosis, year of diagnosis and original histopathological diagnosis) was collected from medical records.

The sample size for this study consist of all histological samples of cervical cancer seen in the Department of

Pathology, University of Calabar Teaching Hospital, Calabar between 1st of January 2005 to 31st December 2013.

The data was entered and analyzed using Epi Info7 software. Descriptive and inferential statistics were employed for analysis. Frequency tables and charts were used to display sociodemographic characteristics and prevalence of each histological types 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.

3. Results

General Findings

A total of two hundred and forty-five (245) female subjects from 31 to 77 years were studied. Their mean age of the subjects was 49 ± 5. Table 1 below shows the age groups of the subjects. Majority 160 (65.3%) of the subjects were aged below 51 years and those aged above 70 years comprised the least number 5 (2.5%).

Table 1: Show the Age Distribution of the Subjects

Age Group (Years)	Frequency (N=245)	Percentage (%)
31-40	63	25.7
41-50	97	39.6
51-60	29	11.8
61-70	50	20.4
>70	6	2.5
Mean Age ± SD	49 ± 5	

Table 2: Relationship between Histological Types and Age Group of Study Subjects

Histological Types	Age Group			Statistics	
	≤49 (n=160) (%)	≥49 (n=85) (%)	Total (N=245)	Chi-square 12.0	P-Value
NSCC	88 (56.4)	68(43.6)	156	df = 9	0.2
KSCC	63 (85.1)	11 (14.8)	74		
BSCC	5(62.5)	3 (37.5)	8		
ADC	4(57.1)	3(42.9)	7		

ADC = Adenocarcinoma;
BSCC = Basaloid Squamous Cell Carcinoma;
KSCC = Keratinizing Squamous Cell Carcinoma;
NSCC = Non-Keratinizing Squamous Cell Carcinoma

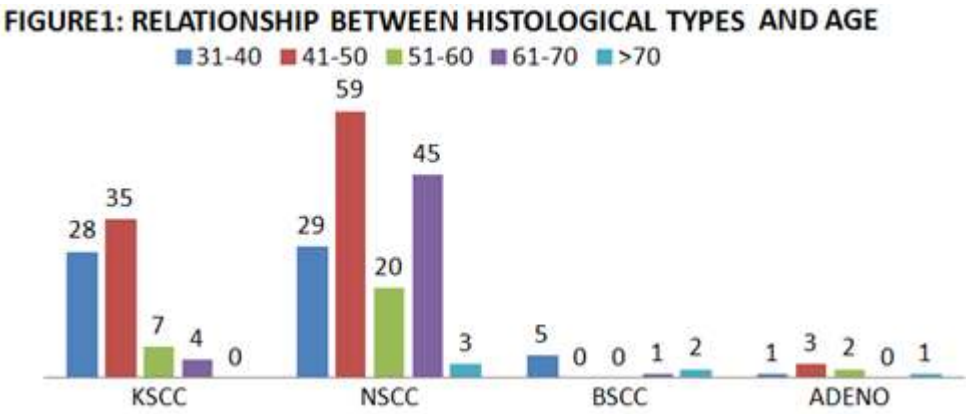
Table 2 represents the relationship between histological type and age of subjects divided into whether they are aged above or below the mean age of study subjects. Subjects aged below 49 years are more likely to have keratinizing squamous cell carcinoma followed by basaloid squamous cell carcinoma histological type, X^2= (9, N=245) = 12.00 p=0.2.

Table 3: The Relationship between Histological Types And Age

Histological Types	Age(Years)					
	31-40	41-50	51-60	61-70	>70	Total
KSCC	28	35	7	4	0	74
NSCC	29	59	20	45	3	156
BSCC	5	0	0	1	2	8
ADENO	1	3	2	0	1	7
TOTAL	63	97	29	50	6	245

ADC = Adenocarcinoma;
BSCC = Basaloid Squamous Cell Carcinoma;
KSCC = Keratinizing Squamous Cell Carcinoma;
NSCC = Non-Keratinizing Squamous Cell Carcinoma

The peak age of squamous cell carcinoma and adenocarcinoma is 41 – 50 years age group. The peak age of KSCC and NSCC is also 41-50 years. The age group with the second highest frequency for KSCC is 61 -70 years and that for NSCC is 31-40 years. The peak age of BSCC is 31-40 years followed by the >70 years age group.



ADC = Adenocarcinoma;
BSCC = Basaloid Squamous Cell Carcinoma;
KSCC = Keratinizing Squamous Cell Carcinoma;
NSCC = Non-Keratinizing Squamous Cell Carcinoma

Figure1 is a bar chart showing the frequency distribution of the various histological type of cervical cancer for each age.

The bar chart shows KSCC, NSCC and adenocarcinoma have the highest frequency in the 41-50 years age group. However, the age group with the highest frequency for BSCC is 31-40 years.

4. Discussion

Two hundred and forty-five specimens were analyzed in this study. This represented 62.6% of all the specimen that was diagnosed with gynaecological malignancy during this study period. This is similar to the finding by a study by Ekanem et al, which shows a prevalence of 63%.[8] This value is lower from a study by Mohammed et al which shows a prevalence of 77%. The relatively early age of marriage of females in northern Nigeria may be associated with the difference in prevalence.[8,9,10,11,12,13]

The mean age of the women in this study is 49 ± 5 years. The study done by Der et al in Ghana show a mean age of 57.8 years which is similar to that from this study.[14] The age range of the women in this study is between 31 and 77 years and peak prevalence at the 41-50 years age group. This age group with the highest prevalence is in agreement with findings in studies in Mohammed et al, Pindiga et al and Mushosho et al.[10,12,14,15,16,17,18,19] These could be due to the lifestyle in sub-Saharan Africa. From this study, one hundred and sixty out of two hundred and forty-five cervical cancer specimens (65.3%) are from women whose ages are ≤ 49 years. A similar finding was observed by Mohammed et al in a study in Zaria which showed that 58% of the cases of cervical cancer occurred in females that are ≤49years.[17] This finding is in contrast to findings by Der et al in Ghana where 70% of the cases were of age above 50 years.[14] The relationship between the age and the histological types also show that specimens from patients below the mean age (≤49 years) are more likely to have keratinizing squamous cell carcinoma followed by basaloid squamous cell carcinoma of the cervix. Though, this relationship was not statistically significant with p=0.2, 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- 45 years.[20] This age is slightly younger than that from the study by Der et al where adenocarcinoma was more common from age ≤ 59 years.[21] The peak age of cervical cancer worldwide is 45 years.[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.[22] This would generally explain why more women ≤49 years had cervical cancer in this study.

There is a paucity of information concerning research on the relationship between age and histological types of cervical cancer. The peak age of keratinizing squamous cell carcinoma is 45-55 years.[23] This is consistent with the findings from this study with a peak age of 41-50 years. The peak age of non-keratinizing squamous cell carcinoma is 40-45 years.[24] This is consistent with that from this study with a peak age of 41-50 years. Information on the peak age of basaloid squamous cell carcinoma was not readily available but the peak age of basaloid squamous cell carcinoma in this study is the 31-40 years age group.

The average age of adenocarcinoma of the cervix is 45-55years which is consistent with the findings from this study with adenocarcinoma commonest in the 41-50 years and 51-60 years age group.[25]

More research needs to be done in order to establish the peak age for the individual types of cervical cancer. This would go a long way in filling this knowledge gap worldwide and aid the development of strategies aimed at eliminating the disease.

5. Conclusion

Cervical cancer is common in women that are less than 50 years of age making young women a huge target at the most productive time of their life. Therefore cervical cancer in addition to being a health problem has turned out to be a big economic problem in our society.

References

[1] Ellenson LH, Pirong EC. Cervix: Premalignant and malignant neoplasm. In :Kumar V, Abbas AK, Fausto N, Aster JC (editors) Pathologic basis of disease. 8th edition. Philadelphia: Elsevier 2010; 1018-1024.
[2] Witkiewicz AK, Wright TC, Ferenczy A, Ronnett BM, Kuman RJ. Carcinoma and other tumours of the cervix In: Kuman RJ, Ellenson LH, Ronnet BM. Blaustein pathology of female genital tract. Sixth edition. New York: Springer Science + Business media 2011; 194-306.
[3] Tavassoli FA, Devilee P. Tumour of the uterine cervix, pathology and genetics: tumours of the breast and female genital organs, World health organization classification of tumours, Lyon, IARC Press 2003: 260-279.
[4] Hausen HZ. Papillomavirus causing cancer: Evasion from host – control in early events in carcinogenesis. J Natl Caner Inst 2000; 92: 690-8.
[5] Oguntayo OA, Zayyan M, Kolawole AOD, Adewuyi SA, Ismail H, Koledade K et al. Cancer of the cervix in Zaria, northern Nigeria. Ecancermedicalscience 2011; 5: 219-221.
[6] Latest world cancer statistics, international agency for research on cancer, world health organisation: pages1-2 available from http://www.iarc.fr/lenmedia-centre/pr/2013/pdf/pr223_E.pdf (cited on 22/03/14).
[7] Thomas JO, Herrero R, Omigbodun AA, Ojemakinde K, Ajayi IO, Fawole A et al. Prevalence of papillomavirus infection in women in Ibadan population – based study, Br J of Cancer 2004; 90(3): 638-645.
[8] Ekanem IA, Ekpo MD, Perera ACP, Khalil MI, Attah EB. Female Genital Malignancies in South-Eastern Nigeria: Ten – Year histopathological analysis with special emphasis on cervical cancer In: Kisekka M N (editor) Women's health issues in Nigeria. Tamaza Publishing Company Limited. 1992; Chapter 5: 41- 49.
[9] Fadahunsi OO, Omoniyi- Esan GO, Banjo AAF, Esimai OA, Osiagwu D, Clement F et al. Prevalence Of High Risk Oncogenic Human Papillomavirus Types in Cervical Smears of Women Attending Well Woman Clinic in Ile Ife, Gynaecol Obstet 2013; 3: 185-197. doi:10.4172/2161-0932.1000185
[10] Omotoso AJ, Agan UT, Bassey IE, Ebughe GA, Ekanem IA, Ekanem AD. Cervical cancer in Calabar, Nigeria. Journal of Hainan Medical College 2010; 16(1) 28-30.

[11] Pindiga UH, El-Nafaty, Ekanem IA. Female genital malignancies in Maiduguri, Nigeria: A review of 328 Cases. Tropical Journal of Obstetrics and Gynaecology 1999; 16: 52-56.
[12] Mohammed A, Ahmed SA, Oluwole OP, Avidine S. Malignant Tumours Of The Female Genital Tract in Zaria, Nigeria: Analysis of 513 Cases, Ann of Afr Med 2006; 5(2): 93-96.
[13] Wabinga HR, Parkin DM. Trends in cancer incidence in Kyadondo county, Uganda, 1960-1997, Br J of Cancer 2000; 82: 1585-1592.
[14] Der EM, Adu- Bonsaffoh K, Tettey Y, Kwame – Aryee RA, Seffah JD, Alidu H et al. Clinico – pathological characteristics of cervical cancer in Ghanian Women. J. med.biomedical sci. 2014; 3(3). Available through: www. ajol.info/index.php/jmbs/article/view/111283. Accessed on 15/1/2016.
[15] Hopenhayn C, King JB, Christian A, Huang B, Christian WJ. Variability of cervical cancer rate across 5 appalachian state. Cancer 2008; 113(10): 2974-2980.
[16] Pikor LA, Enfield KSS, Cameron H, Lam WL. DNA Extraction from Paraffin Embedded Material for Genetic and Epigenetic Study. J Vis Exp 2011; 49: 2763 – 2768, Doi 10. 3791/2763.
[17] Sule ST, Shehu MS. Cervical cancer management in Zaria, Nigeria. Afr J Health Sci. 2007; 14: 149 -153. Ndlovu N, Kambarami R. Factors associated with tumour stage at presentation in invasive cervical cancer. Cent Afr J Med 2003; 49(9-10): 107-11.
[18] Ndlovu N, Kambarami R. Factors associated with tumour stage at presentation in invasive cervical cancer. Cent Afr J Med 2003; 49(9-10): 107-11.
[19] Badar F, Anwar N, Meerza F, Sultan F. Cervical carcinoma in a muslim community. Asian Pac J Cancer Prev. 2007; 8(1): 24-6.
[20] Chan PKS, Chang AR, Yu MY, Li W, Chan MYM, Yeung ACM et al. Age distribution of human papillomavirus infection and cervical neoplasia reflects caveat of cervical screening policies. Int. J. Cancer 2009; 126: 297 – 301.
[21] KrennHrubec K, Mrad K, Sriha B, Ayed F B, Boltalico DM, Ostolaza J et al. HPV Types and Variants Among Cervical Cancer Tumours in Three Regions of Tunisia. J Med Virol. 2011; 83(4): 651-57.
[22] Bruni L, Barrionuevo-Rosas L, Albero G, Aldea M, Serrano B, Valencia Set al. ICO Information Centre on HPV and Cancer (HPV Information Centre). Human Papillomavirus and Related Diseases in the World. Summary Report 2014: p. 12-18.
[23] Dovemed, keratinizing squamous cell carcinoma, available through https://www.dovemed.com/diseases-conditions/keratinizing-squamous-cell-carcinoma-cervix. Accessed on 22/01/2018.
[24] Zaloudek C, Adenocarcinoma of the cervix. Available through http://labmed.ucsf.edu/uploads/237/114_ci_2010_adenocarcinoma_of_the_cervix.pdf
[25] Distinctive features, Non-keratinizing Squamous Cell Carcinoma. Available through https://www.bioscience.org/ref/tumpath/freprod/cervix/3/synposis.htm