

The Relationship between Age and Histological Types of Cervical Cancer

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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 aetiological 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 \pm 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, $X^2 = (9, N=245) = 12.00$ $p=0.2$.

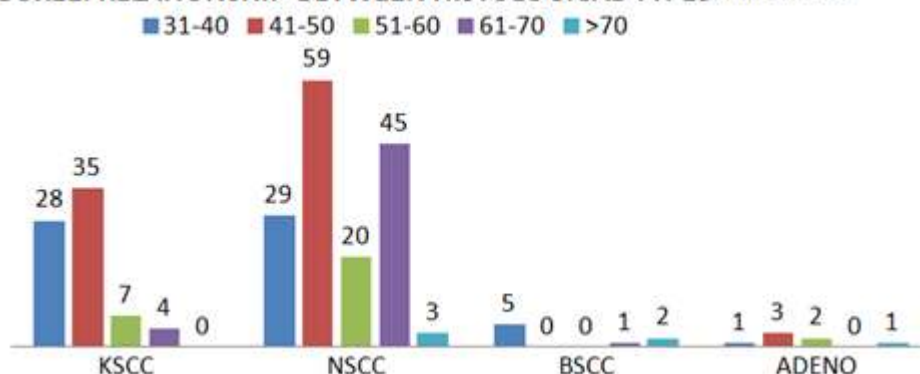
Table 3: The Relationship between Histological Types And Age

| Histological Types | Age(Years) | | | | | Total |
|--------------------|------------|-------|-------|-------|-----|-------|
| | 31-40 | 41-50 | 51-60 | 61-70 | >70 | |
| 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.

FIGURE1: RELATIONSHIP BETWEEN HISTOLOGICAL TYPES AND AGE



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

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.

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

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 ≤ 49 years.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 45-55 years 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.

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