Breast Cancer Trend: A Case Study of a Tertiary Health Institution in Nigeria

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Abstract

Background: Breast cancer is a major global health problem in women from both developing and developed countries. As the leading cause of death among women, breast cancer has contributed 19.5% to the mortality rate among women in Nigeria. This study investigated the trend of breast cancer among women who attended Federal Teaching Hospital, Ido-Ekiti, Nigeria.

Methods: This retrospective study examined the trend of breast cancer over a period of eight years and determined the most affected age group. Participants consisted of patients registered in the cancer registry who had histologically confirmed breast cancer. Data of 362 patients were examined between March and April 2016. Data were analyzed and presented using descriptive (frequency, charts, and percentages) and inferential statistics (Fisher's exact) for hypothesis testing.

Results: Findings of this study revealed that the mean age of the participants was 45.04±16.94 years and all patients involved were females. The age group 20-39 years was most affected by breast cancer with a proportion of 41.7%. This study revealed a relationship between breast cancer classification and age of patients (*P*=0.011). Almost all (94.3%) cases seen within this time period were malignant.

Conclusion: Healthcare professionals should place more emphasis on prevention of breast cancer across all age groups, especially young adults. These young adults constitute the larger percentage of the adult population. An increase in mortality rate in this age group will reduce the labor force and affect the nation's economy.

Keywords: Benign, Breast cancer, Trend, Malignant, Nigeria

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Introduction

The World Health Organization declared that the rate of breast cancer will increase by 50% globally.[1] There is no recent rate of disease incidence in Nigeria other than the rate computed by the International Agency for Research on Cancer (IARC) that obtained data derived from three population-based registries

in Nigeria (Abuja, Calabar, and Ibadan) in 2012. According to the study, 26.7% (27304) women with confirmed breast cancer were reported.[2,3] As the leading cause of death among women, breast cancer contributed 19.5% to the mortality rate among women in Nigeria.[2,3]

Just like any other cancer, breast cancer occurs as a result of interaction between the environment and a genetically susceptible host. Cells become cancerous when they compromise in their ability to stop dividing, attaching to other cells to stay where they belong, and die at the proper time.[4] Breast cancer is the leading cause of death among women with over one million new cases diagnosed annually which results in over 400,000 deaths annually.[5]

Breast cancer is a major health problem in both developing and developed countries. It is the most common invasive cancer in women globally.[6] Breast cancer can be defined as a malignant disease that occurs when there is an uncontrolled growth of abnormal cells in the breast. This condition can be found in both males and females but the rate of occurrence is more in females. Normal cells will commit cell suicide (apoptosis) when they are no longer needed. Until then, cells are protected from suicide by several protein clusters and pathways. It has been deduced that sometimes the genes along these protective

pathways mutate in a way that turns them permanently "on", rendering the cell incapable of committing suicide when it is no longer needed.[4] In our present age breast cancer is seen as the number one cancer scourge that afflicts humans, particularly women, and is the leading cause of death and disability among women.[7]

Presently, in the United States, the incidence is about 190,000 in women and 1,900 in men. More than 40,000 deaths are recorded annually.[8] In African-American women, the rate of incidence is almost the same as Caucasian women.[9] In Nigeria, the Medical Director of the Optimal Cancer Care Foundation in Lagos has declared that breast cancer kills one in every 25 Nigerian women.[10] It was reported that the 5-year survival rate for breast cancer patients in the United States exceeds 85%, but in Nigeria it is about 10%.[10] The incidence and overall mortality rates continue to be lower in most high-income countries compared to developing countries.[11] The case fatality rates are higher in developing countries which may be attributed to lack of awareness of the benefits of detection and treatment, scarcity of adequate facilities for detection and diagnosis, and poor access to primary treatment. In identification of breast cancer, timing of exposure is important with respect to mechanism and susceptibility.

In Nigeria, breast cancer constitutes a major
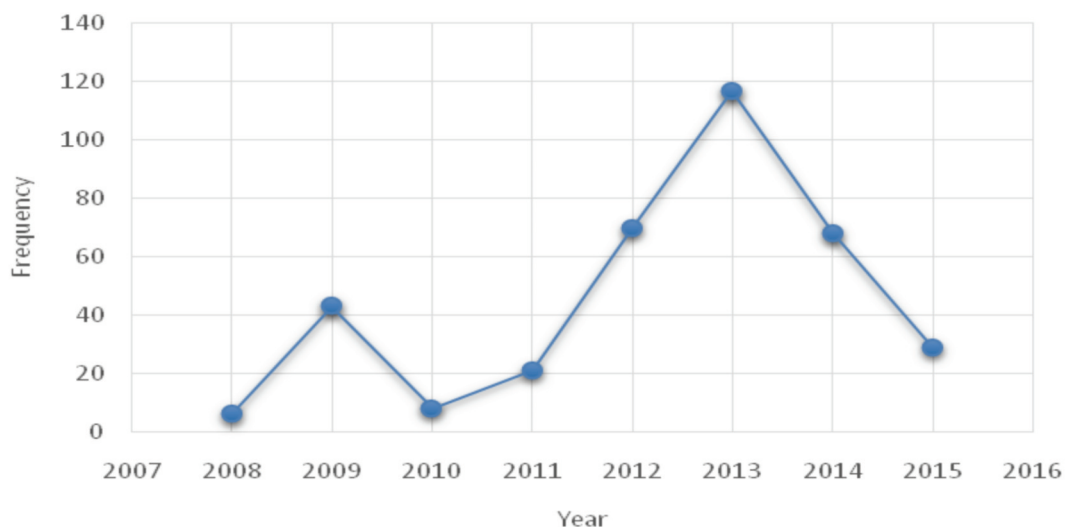
Figure 1. Breast cancer frequency per year in cases from the Federal Teaching Hospital, Ido-Ekiti (FETHI).

public health issue. However, the available statistics are largely unreliable because of numerous factors that have not allowed for adequate data collection and documentation. It is therefore necessary to assess the trend of breast cancer cases seen in a tertiary hospital in order to facilitate an appropriate intervention program for the mostly affected age group. The objective of this study is to determine the trend of breast cancer in a tertiary healthcare facility in Nigeria.

Table 1. Age distribution of breast cancer cases seen at the Federal Teaching Hospital, Ido-Ekiti (FETHI).

| Age group (years)	Frequency	Percentage
<20	3	0.8
20-29	85	23.5
30-39	66	18.2
40-49	62	17.1
50-59	56	15.5
60-69	53	14.7
≥70	37	10.2
Total	362	100

Materials and Methods

This retrospective study covered a period of eight years (January, 2008-January, 2015). The study was conducted at the Federal Teaching Hospital, Ido-Ekiti (FETHI), Ekiti state, Nigeria, a tertiary institution located in a rural area in Ekiti-State, Nigeria. The Federal Teaching Hospital, Ido-Ekiti is one of the two teaching hospitals in this state. The hospital was established in July, 1998 as a Federal Medical Center and later upgraded to a teaching hospital in September, 2014 by the Federal Government of Nigeria. The facility is located at Ido-Osi Local Government. This hospital is a 280 bed institution that has 24 functional wards with other ancillary units such as a Radiology Department, Laboratory, and Pharmacy.

We examined and analyzed all breast cancer records available in the Histopathology Laboratory at FEHTI. The study included all breast cancer cases seen and diagnosed histologically in eight years (January, 2008-January, 2015). We used the total sampling frame as all available records on the 326 cases seen within this time period. The data were gathered between March and April 2016. We only used information from patients who had histological diagnoses. Information on patients' records included age, gender, basis of diagnosis, breast cancer type, and date of diagnosis. Data were analyzed using Statistical Package for Social Sciences (SPSS) version 20 at the univariate and bivariate levels. Descriptive statistics of frequency counts and percentages were used for data analysis. Data were presented in tables and charts with a significant P-value set at <0.05. Bivariate analysis was carried out using
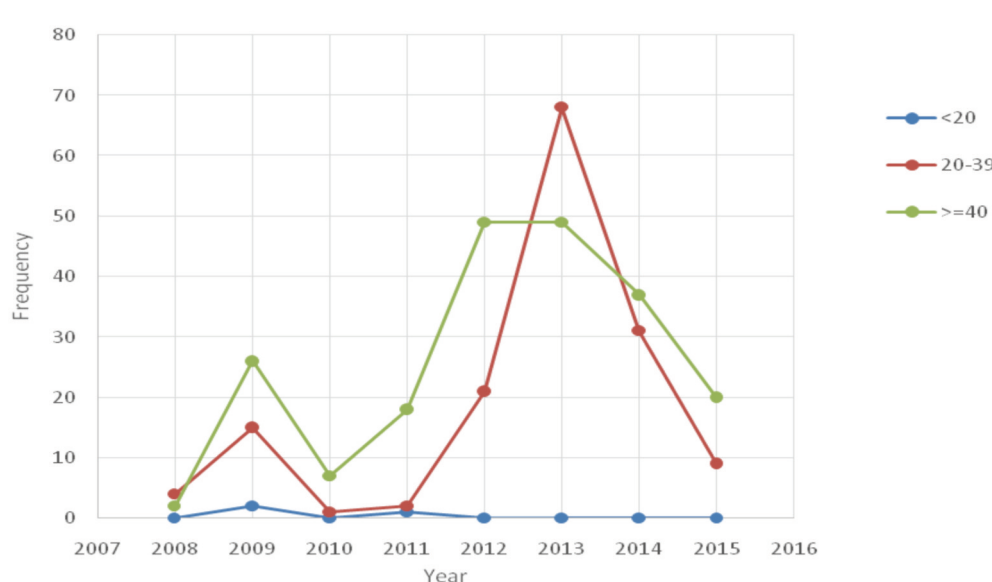
Figure 2. Breast cancer trend by age group.

Fisher's exact test for discrete variables in testing the hypothesis. The Ethical Review Board of FEHTI, located in Ido-Ekiti, Nigeria, grated ethical clearance.

Results

Table 1 shows the demographic profile of breast cancer cases seen at FETHI. The mean age was 45±16.94 years. Almost half (42.5%) of the women diagnosed with breast cancer were below 40 years of age and all cases were women (100%).

From table 2, the most common breast cancer types were: adenocarcinoma (18.2%), ductal carcinoma (15.2%), malignant mastocytosis (13.3%), fibrosarcoma (11.6%), and fibromyxosarcoma (11.1%). In this study, the majority (94.3%) of breast cancers were malignant while 5.7% were benign.

There was a statistically significant relationship between age and breast cancer classification (Table 3).

Figure 1 shows that a higher percentage (32.3%) of breast cancer cases in 2013 followed by 2012 (19.3%) and 2014 (18.8%).

Discussion

Breast cancer and age

This study showed a decline in the number of breast cancer cases with respect to age. The findings of this study revealed that the most affected age group was between 20-29 years of age (Table 1). This finding has contradicted reports such as a study in Ireland which showed the highest incidence in women aged between 45-64;[12] a 34.3% incidence among Singaporean women aged 45-54 years between 2005-2009;[13] and a 28% incidence among women aged 50-69 in Norway.[14] There are a number of known breast cancer risk factors which include high socioeconomic status;[15] history of breast cancer in a first degree relative;[16] high doses of radiation exposure;[16,17] diethylstilbestrol exposure during pregnancy;[18] breast cancer (BRCA) genetic mutations to BRCA1, BRCA2, and other breast genes;[16] low age at menarche and high age at menopause;[19] postmenopausal high body mass index;[20] lifestyle factors such as obesity, lack of

Table 2. Breast cancer types seen at Federal Teaching Hospital, Ido-Ekiti (FETHI).

Breast cancer type	Frequency	Percentage
Adenocarcinoma	66	18.2
Fibromyxosarcoma	40	11.1
Malignant mastocytosis	48	13.3
Fibrosarcoma	42	11.6
Lump breast mass	6	1.7
Ductal carcinoma	55	15.2
Fibroadenoma	8	2.2
Fibrocystic disease	4	1.1
Medullary carcinoma	2	0.6
Metastatic carcinoma	5	1.4
Lobular carcinoma	2	0.6
Squamous cell carcinoma	6	1.7
Carcinoma simplex	5	1.4
Sclerosing adenosis	1	0.3
Lactating adenoma	1	0.3
Chronic granulomatous mastitis	1	0.3
Other	12	3.3
Missing data	58	16.0
Total	362	100

exercise, and alcohol use;[16] and long-term use of hormone replacement therapy.[21] However, a number of protective factors include low age at first childbirth,[19] high parity,[19] and physical activity.[22,23] It is unknown what risk factors could have increased the occurrence of breast cancer in this young age group in the current study. The general knowledge is that the risk of breast cancer increases with age, with most cases that develop in women after menopause.[16] Tobacco use and obesity are the most likely factors responsible for breast cancer in Africa. Hence, they are the most feasible, cost-effective approaches to cancer control.[24]

In 1996, Gaudette et al. reported a rise in incidence of breast cancer after the age of 30 years. The highest rates were among Canadian women aged 60 and above.[25] In 2001, the highest incidence of breast cancer in Japan was among the 50-54 age group; in the US, it was among the 55-59 age group in 2002.[26] In both countries, the number of new cases began to increase after the age of 20 years, reached a peak at the age of 50-59 and declined thereafter. In Egypt, from 1999-2008, the highest incidence rate of breast

Table 3. Association between age and breast cancer classification.

Variable	Malignant		Benign		Fisher's	*P*-value
Age group (years)	n	%	n	%	exact test	
<20	1	0.3	2	10.0	9.477	0.011*
20-39	141	42.6	7	35.0		
≥40	189	57.1	11	55.0		

*significant at *P*<0.05

cancer was among women aged 40-49 years. However, it has been projected that a significant increase in breast cancer caseloads will be among women aged 30-39 years by 2015.[27] Our findings have shown that the occurrence of breast cancer peaked at the age of 20-29 and later declined with increasing age. This calls for a refocus on the target age group for breast cancer screening. The occurrence of breast cancer at a young age could result in women dying young despite the fact that the life expectancy at birth in Nigeria is 48 years.[28] This paradigm shift in breast cancer among female age groups is alarming. The findings of this study could actually be the tip of an iceberg. However, other studies should be carried out to verify this observation and determine if technological advancement, sexual practices, early menarche, carcinogens, and modern/Western lifestyle behaviors have contributed to this observation among young adults.

Breast cancer trend

In Nigeria, although breast cancer constitutes a major public health problem, statistics are largely unavailable and unreliable. In 2008, breast cancer was the most common cancer among females in Nigeria.[25] The result obtained from this study indicated that the breast cancer trend among women from 2008 to 2015 did not show a specific direction over these years (Figure 1). There was a rise between 2008 and 2009, followed by a decline in 2010. From 2010 to 2013, there was an increase in the number of breast cancer cases reported. From 2013 to 2015, we observed a drastic decrease in the number of cases reported. The trend reported by most developed countries indicated a consistent decline in the incidence of breast cancer. Early detection by mammography, implementation of early treatment, and improved

therapeutic modalities were attributed to the recent decrease in the mortality rate from breast cancer in the US.[26] The trend observed in this study could have been influenced by lack of awareness, lack of diagnostic instruments, lack of access to hospital facilities and, more importantly, socio-economic status. The number of breast cancer cases for the 20-39 and above 40 age groups peaked in 2013 (Figure 2).

Breast cancer type and classification

The most common types of breast cancer reported were adenocarcinoma (18.2%), ductal carcinoma (15.2%), malignant mastocytosis (13.3%), fibrosarcoma (11.6%), and fibromyxosarcoma (11.1%). The findings showed that the right side (17.4%), left side (14.1%), and both sides (0.3%) of the breast were mostly affected. However, this finding was inconclusive because approximately 68.2% of the data that stated the affected side was not available. Nearly all cases (94.7%) presented with malignant cells. From this result, we could infer that most women diagnosed with breast cancer presented with malignant tumors which implied late presentation. Most women only come for screening at the time when other body parts have been affected, which would account for an increased mortality rate. Educational intervention on breast self-examination among women of all age groups might be the best approach to avoid late presentation.

Limitations

Other sociodemographic characteristics such as educational level, socioeconomic status, marital status, ethnicity, and residence (rural/urban) were unavailable for in-depth analysis and comparison. Availability of this information could have made

it possible to determine other factors responsible for the observed frequencies of breast cancer. Studies have shown that women with high socioeconomic status had a 20% to 30% significantly higher incidence but 30% to 40% lower fatality compared with women with the lowest socioeconomic status.[15,29] Breast cancer rates also varied by ethnicity in the US[16] but were independent of ethnicity in other studies.[13,29] Information on the site of tumor, tumor grade, and other tumor characteristics were also missing.

Recommendations

The incidence of breast cancer in Nigeria (26.7%) and West Africa (26.4%) is a growing public health concern.[2,24] The mortality rate from breast cancer in Nigeria (19.5%) and West Africa (21.0%) present a tremendous problem.[2,24] Efforts should be made to address this burden through awareness campaigns. Annually, on February 4th, the International Union against Cancer (UICC) leads a World Cancer Day to raise awareness of cancer prevention.[30] It is important that the Nigerian government and non-governmental organizations engage in periodic awareness campaigns for breast cancer prevention. Mammography screening should be made available, affordable, and accessible to all age-groups. Resources should also be made available for early detection and treatment of breast cancer cases. This will increase the survival rate for breast cancer among women. Reduction or elimination of exposure to cancer-causing factors through effective tobacco control measures, reduction of excessive alcohol consumption, dietary intervention, reduction in occupational exposure to carcinogens, and maintenance of healthy body weight and physical activity[30] will have a considerable impact on reducing the incidence and mortality rates of breast cancer in Nigeria. More studies should be conducted to ascertain the incidence, mortality, and survival rates of breast cancer among women in Ekiti state. A cancer registry should be established in the state with mandatory compliance for case reporting.

Conclusion

This study established that the trend of breast cancer among women who attended FETHI shifted from the middle age group to young adults. The findings of the study revealed that the most affected age group was between 20-39 years which constituted a larger percentage of the adult population. It could be deduced that adenocarcinoma was the most common type of breast cancer seen in this health facility. The majority of breast cancer cases that presented were malignant, which revealed late presentation of the disease.

Acknowledgement

Conflict of Interest

None declared.

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