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A Four-year Retrospective Survey on the Histopathological Patterns of Breast Cancers in Delta State University Teaching Hospital Oghara in Nigeria

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Background: Breast cancer a leading gynecological cancer with a record of 25% of all known cancer and responsible for 16% deaths except skin cancer. It affects both gender but with a higher incidence amongst females, also female age groups of reproductive age and can be presented in various patterns. The study aim was to evaluate the histopathological patterns of breast cancer in Delta State University Teaching Hospital, Oghara, Delta State. **Methods:** This retrospective study was carried out in the histological department in Delta State University Teaching Hospital, Oghara within a time frame of four years. Various histologic types of breast cancer were examined. Data were analyzed and were presented in form of tables. **Results:** Diagnosis of breast cancer showed a higher proportion in the year 2015 (38.3%) and the lowest been 2017 with a percentage of 15.8% in the general population. Patients within the ages of 30-39 years of age displayed a higher incidence of 32.2%. The least affected age groups are 20-29yrs (2.3%) and 70-79yrs (2.3%). The invasive ductual carcinoma (91%) was mostly common. **Conclusions:** Breast cancer is common in women of reproductive age (30-40years of age); with its most occurring pattern been the invasive ductal carcinoma and the year with highest level of occurrence been 2015. Future studies should be carried out among other hospitals across Nigeria to help bridge the gap on the insufficiency of studies on breast cancer among Nigerian women

Keywords:

Breast; Cancer; Histopathological; Patterns.

Introduction

The breast is a modified apocrine sweat gland which lies between the second and sixth rib and found in pair. Both male and females have breast but well developed in the females due to hormonal activity during puberty but for the males due to testosterone it becomes rudimentary.

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Anatomically, female breast mainly comprises of lobes which constitute lobules, the ducts which act as a conduit for milk transport at the nipple. The stroma which contains fats, connective tissue, blood vessels, and lymph nodes [1]. Abnormal production of cells is usually in the epithelial lining of ducts, lobes, lobules, muscles and also lymph nodes, these cells often metastasize through the lymphatic system which when left unattended could lead to death [2]. Indications of this gynecological trepidation include swelling, distortion, scaling and the appearance of a firm mass in the breast which could be benign or malignant.

According to [3]; cancer can be termed a disease condition in which cells in certain parts of the body have an uneven ratio of production to death such that its production rate is higher than the latter [3]. Carcinoma of the breast is of two (2) main categories; the non-invasive (it's found only at its origin) and invasive (spreads from its source of origin) [4]. A case where these cancerous cells affect the epithelial lining the ductal system is referred to as ductual carcinoma, non-invasive type of breast with a prevalence of 83% worldwide [5, 6]. Lobular carcinoma (lobular neoplasia) occurs due to invasion of the lobular system by cancerous cells; an invasive type with an occurrence of 12% in females[5, 6]. [5,6]. Recent studies on breast cancer have shown the muscle fibres, lymph nodes as well as the glands in the breast are also affected by outgrowth of cells and such condition is termed sarcoma which has a low incidence level [7].

The exact etiology of breast cancer have not yet been ascertained but certain risk factors such as age, hormonal response, genetic predisposition, race, gender, lifestyle, exposure to radiation etc. could be instrumental to the increase in the risk of breast cancer [8]; Studies have shown females having a higher prevalence rate of 99% compared to their male counterpart with a prevalence rate of as low as 1% simply because of their possession of more breast tissues and estrogen (a female hormone breast growth). These simply show gender has an undeniable predilection to breast cancer [2]. [9] carried out a research which showed American women aged 40 and 60 years had an incidence rate of 99.3% and 71.2% respectively which depicted the contribution of age as risk factor of breast cancer.

Recent studies have been able to pin-point certain genes which on mutation are susceptible to breast cancer; these genes are BRCA-1 and BRCA-2 [10,11]. Mutations in these genes have been associated to about 5-10% of breast cancer cases, with the risk of such mutations directly proportional to an increase in age [10]. A study showed women aged 70 years with mutations in in the genes posing a risk 44-78% and 31-56% respectively of becoming breast cancer victims [11]. In another study carried out by [10] showed women aged 35 years with BRCA-1/BRCA-2 mutation had a 9.4% chance of developing breast cancer. Other genetic conditions such as p53 (Li-Fraumeni) and Cowden syndromes also play a role in increasing the predilection to breast cancer [12,13]. Hormones such as estrogen and progesterone if in an abnormal quantity could result in an increase in the risk of this disease [14]. Approximately 80% of cancerous cells grow in response to estrogen with 65 % of breast cancer cases responding to progesterone, this simply shows that hormones play a vital role in the incidence of breast cancer. Radiations as we all know are harmful if exposed to lethal doses. Research has it that breast carcinoma increases as the level of exposure to radiations increases [15,16].

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Globally, Breast cancer is regarded as the leading gynecological cancer with a prevalence of 25% of all known cancer cases with also the cause of 16% of all cancer deaths except for that of skin cancer; of which it's the second leading cause of cancer death in women [17]. According to the American cancer society, in the year 2012, breast cancer was present in an estimate 1.68 million individuals and it claimed the lives of 522,000 persons worldwide [17]. This disease is more common in developed countries with a frequency of three times that of underdeveloped countries, also in females than men with a ratio of 100:1; making it the ninth most common cause of death in developed countries [18,19]. The incidence level of breast cancer varies based on continent with North America, parts of Europe and Australia having an incidence level of 75-100 cases in 100,000 women which was more on comparison with African and Asian women with an incidence of 20 cases in a 100,000 [20]. According to [21], on annual bases a rough estimate of about 500,000 recent cases of cancer is discovered in Nigeria, breast cancer plays an undisputable burden in Nigeria [22]. Studies conducted among Nigerian population has shown the peak incidence age in females to be 42.6 years with a mean of 46.8±11.5 years, with a large number of this diagnosis done during lactation or pregnancy [22]. Regardless of the ravaging nature of this disease, medical interventions have been adopted to help curb this menace such methods include chemotherapy, hormone receptor replacement and genetic modification (gene knocking-out, gene replacement). The methods have helped pave a way-out for breast cases victims. The study aim was to investigate the histopathological types of breast cancer in Delta State Teaching Hospital Oghara, Delta State in Nigeria.

Methodology

Study Design and Sampling Technique: The retrospective cross-sectional survey design was adopted and purposive sampling technique for data collection.

Data Collection: Data used in course of this study were obtained from the histopathological results of female patients diagnosed with breast cancer dating between 2014 - 2017 in the Histopathology Department, Delta State University Teaching Hospital, Oghara.

Ethical Consideration: Prior to the onset of data collection, ethical approval was sought from Department of Histopathology, Delta State University Teaching Hospital Oghara (DELSUTH).

Data Analysis: Data were analysed and results were presented using simple percentage frequency distribution as the descriptive statistics and Chi-square test of association inferential statistics. Significance was accepted at a probability value less than 0.05.

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Results

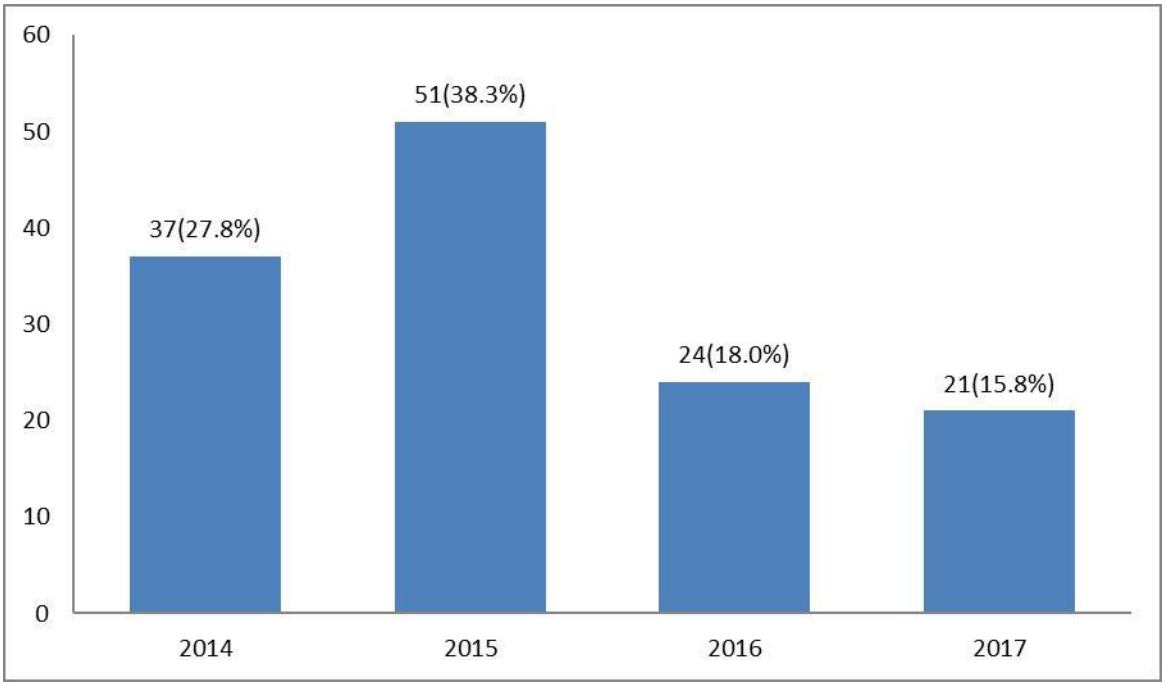

Figure 4.1 shows the distribution of Breast Cancers According to Year

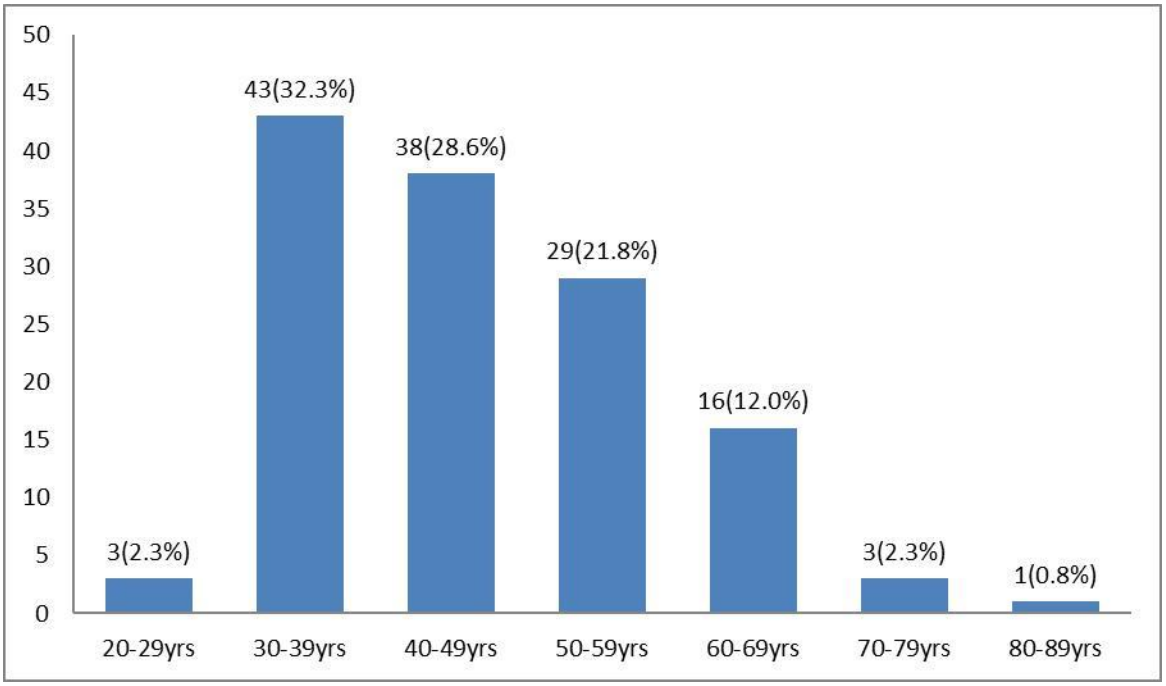

Figure 4.2 shows the distribution of Breast Cancers Occurrence according to Age

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Table 4.1: Distribution of Histologic Sub-types of Breast Cancer.

Types	Frequency (%)
INSITU CARCINOMA	
Lobular Carcinoma insitu	-
Ductal Carcinoma insitu	1(0.8)
INVASIVE CARCINOMA (NST)	
Invasive Lobular Carcinoma	-
Invasive Ductal Carcinoma	121(91)
SPECIAL TYPES (invasive)	
Papillary Carcinoma	2(1.5)
Medullary Carcinoma	1(0.8)
Mucinous Carcinoma	5(3.8)
MISCELLANEOUS (invasive)	
Metaplastic/carcinosarcoma	2(1.5)
Malignant phyllodestumour	1(0.8)
Total	**133(100)**

Table 4.2: Distribution of Histopathological Types of Breast Cancers according to Age Group

Types	Age Group (Years)								Chi-square	P-value
	20-29	30-39	40-49	50-59	60-69	70-79	80-89	Total		
INSITU CARCINOMA										
Lobular Carcinoma Insitu	-	-	-	-	-	-	-	0		
Ductal Carcinoma Insitu	1	-	-	-	-	-	-	1		
INVASIVE CARCINOMA										
Invasive Lobular Carcinoma	-	-	-	-	-	-	-	0		
Invasive Ductal Carcinoma	2	43	38	29	9	-	-	121	183.69	0.001
SPECIAL TYPES (invasive)										
Papillary Carcinoma	-	-	-	-	2	-	-	2		
Medullary Carcinoma	-	-	-	-	1	-	-	1		
Mucinous Carcinoma	-	-	-	-	4	1	-	5		

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MISCELLANEOUS (invasive)								
Metaplastic/carcinosarcoma	-	-	-	-	-	2	-	2
Malignant phyllodes tumour	-	-	-	-	-	-	1	1
Total	**3**	**43**	**38**	**29**	**16**	**3**	**1**	**133**

Figure 4.1 showed the distribution of breast cancer over a period of 4 years with 2015 having the highest frequency of 51(38.3%), and 2017 having the least incidence of 21(15.8%).
Figure 4.2 showed the age distribution with those within the ages of 30-39 years with an incidence of 43 (32.3%) followed by those within the ages of 40-49 years who had an incidence of 38(28.6%), 50-59yrs of age with (21.6%), and the least affected age group been 80-89years of age with an occurrence of 1(0.8%) along with those within the ages of 20-29 and 70-79 with an occurrence of 3(2.3%).
Table 4.1 shows distribution patterns of breast cancer with invasive ductual carcinoma been the most prevalent making up 121 (91%), with mucinous carcinoma with a frequency of 5(3.8%) and the least prevalent been ductal carcinoma insitu, medullary carcinoma and malignant phyllodes tumour with prevalence of 1(0.8%).
Table 4.2 shows that there is a significant association between Histologic subtypes of breast cancer and age group with p-value < 0.05 ($p=0.001$).

Discussion

According to [3]; breast cancer overtime has been ranked amongst the commonest human cancer globally affecting men and women but mostly of reproductive age with a ratio of 1:99 respectively [3], [23]. The aetiology behind this disease condition is yet to be known, but age, exposure to radiation, hormonal imbalance, and genetics have shown to have an effect on its development [8].

Researches have demonstrated undisputed effect of age and development of breast cancer. From this study, women aged 30-39 years had a higher distribution of 43(32.3%) which was in concordance with related research work on breast cancer depicted women of reproductive age having a higher prevalence [24,25,26]. Previous investigation in Pakistan, revealed that women aged 30-50 years had a higher incidence rate [23] which was in agreement to our results. But or findings is in contrast to the that observed in Europe and the United States which depicted women in 7^{th} decades having higher prevalence [27].

Our findings showed invasive ductual carcinoma with a proportion of 121 which was 91% of cases. These results were in conformity to those obtained in a study conducted in Nigeria, where invasive ductal carcinoma was depicted with an incidence of 94% [28].

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Our investigation revealed that diagnosis of breast cancer was at its peak in the year 2015 with a proportion of 51 (32.3%), which could be of lack of awareness on this challenging disease, this evident with a further reduction in occurrence in the year 2016 and 2017 with proportions of 18.0% and 15.8% respectively. But as observed from consequents years it showed increase awareness, which helped checkmate the incidence rate and its development. This finding is in tandem with the submissions of [19, 21] who reported that increase awareness and sensitization of the disease among a populace could lead to a favourable prognosis for people predilected to carcinoma of breast.

Conclusion

The invasive ductal carcinoma is the predominant common pattern of breast cancer malignancy observed from our study with a predilection of women between 30-40 years. Further studies should be carried out among other hospitals across Nigeria to help bridge the gap on the insufficiency of data among Nigerian women.

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