

Histopathological Review of Male Breast Cancer in Sokoto, Nigeria

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Abstract

Background: Male breast cancer is a rare disease that is not well characterized and accounts for <1% of breast cancer incidence and <1% of all male cancer cases. It also carries a significantly higher mortality rate when compared with the breast cancer in female patients. The notion that men could also be afflicted with breast cancer is apparently not widely perceived. The aim of this study is to evaluate the incidence of male breast cancer cases in a tertiary hospital in North-Western Nigeria. **Materials and Methods:** Over a 10-year period (January 2006 to December 2015), all hematoxylin and eosin-stained sections of biopsies from male breast clinically diagnosed as cancer (mastectomies and biopsies) were retrieved from the departmental archives and reviewed to confirm the initial diagnosis. Clinical biodata were obtained from patients' request forms and histology register. Data obtained were analyzed using the Statistical Package for the Social Sciences (SPSS) version 20 and presented as simple frequency tables. **Results:** There were a total of 33 male breast cancer cases histologically diagnosed during the study period. This constituted 4.3% of all breast cancer cases in the period. The mean age was 49.7 years with standard deviation \pm 17.3 years and age range of 20–99 years. The results revealed that 14 (42.4%) patients had right breast cancer, followed by left that accounted for 10 (30.3%), bilateral 5 (15.2%), and side unspecified 4 (12.1%). With respect to histologic types, 30 (90.9%) of cases seen were invasive carcinoma no special type (NST) while lobular carcinoma accounted for 2 (6.1%), and mucinous adenocarcinoma was 1 (3.0%). **Conclusion:** This study showed males in our environment do suffer from breast cancer albeit in a small proportion and that invasive carcinoma NST was the most predominant histological variant of male breast cancer cases in our region.

Keywords: Breast cancer, histopathology, male, Sokoto

INTRODUCTION

In contrast to female breast cancer, male breast cancer is a rare disease, and has not been well characterized unlike female breast cancer.^[1] Male breast cancer accounts for <1% of all breast cancer incidence and <1% of all male cancer cases.^[2-5] It also carries a significantly higher mortality rate when compared with the breast cancer in female patients.^[5,6] Unlike the epidemiological variations in trends seen over the past few decades in female breast cancer, the incidence of breast cancer in males has not increased and even large oncology centers tend to have small number of male breast cancer patients.^[7]

The incidence of male breast cancer, once thought to be relatively stable, now seems to be substantially increasing.^[3] Male breast cancer incidence has increased significantly from 0.86 to 1.06 per 100,000 populations over the last 26 years.^[3] The worldwide incidence of male breast cancer has similar variations to that of

female breast cancer. North America and Europe has recorded higher incidence rates than Asia.^[8,9] The incidence of male breast cancer in Europe and North America is 1/100,000. Statistics from the United States indicates that male breast cancer accounts for 0.9% of all breast cancers, 0.2% of all malignant neoplasms in males, and 0.1% of all malignant neoplasms in both sexes.^[7] The incidence rate of male breast cancer is <0.5/100,000 in Japan. However, it is more frequent in Egypt and Zambia.^[10,11]

Although the epidemiologic literature on female breast cancer is extensive, little is known about the etiology of male breast

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cancer. This is mostly due to the rarity of this disease in men, which greatly limits the application of epidemiologic methodology to the studies of male breast cancer.^[10]

The low incidence of the disease has resulted in only a superficial knowledge of its etiology, biological behavior, and treatment.^[12] The prognostic factors, epidemiological factors, and behavior of breast cancer are different for males than females.^[5,6,12] Although the mortality and survival rates have been significantly improved for both male breast cancer and female breast cancer patients, more progress has been made in female breast cancer than male breast cancer.^[12]

In our society, it often comes as a surprise to many that men can also have breast cancer.^[7] Due to the lack of sufficient data in males, treatment regimens for male breast cancer are based on the assumption that it shares similarities to female breast cancer.^[13] Therefore, the prognostic features and therapeutic aims of female breast cancer are extrapolated to male breast cancer. Although there are similarities in breast cancer occurring in males and females, there are also mounting evidences that they are quite different biologically.^[2] There is little proof that the prognostic features found in female breast cancer are also valid for male breast cancer.^[14]

This is a 10-year descriptive retrospective study of male breast cancer carried out at a teaching hospital in Sokoto, North-Western Nigeria.

MATERIALS AND METHODS

Over a 10-year period (January 2006 to December 2015), all hematoxylin and eosin-stained sections of male breast specimens diagnosed as cancer (mastectomies and biopsies) were retrieved from the departmental archives and reviewed to confirm the initial diagnosis. Clinical biodata were obtained from patients' request forms and histology register. Data obtained were analyzed using the Statistical Package for the Social Sciences (SPSS) version 20, Chicago, Illinois, USA and presented in frequencies and percentages.

RESULTS

There were a total of 33 male breast cancer cases histologically diagnosed during the study period. This constituted 4.3% of all breast cancer cases (both males and females) diagnosed during the study period. The mean age was 49.7 years with standard deviation \pm 17.3 years, and the age ranged from 20 to 99 years. The highest frequency of affectation was in the 4th and 6th decades of life [Table 1].

Fourteen (42.4%) patients had right breast cancer, 10 (30.3%) had left breast cancer, 5 (15.2%) had bilateral breast cancer, and in 4 (12.1%), the side was unspecified as shown in Table 2. The most common histological type was invasive carcinoma no special type (NST) which accounted for 30 (90.9%) patients, followed by invasive lobular carcinoma which had 2 (6.1%) cases and mucinous adenocarcinoma 1(3.0%) case as shown in Table 3.

Table 1: Frequency of laterality of male breast cancer

Organ/site	Frequency (%)
Right breast	14 (42.4)
Left breast	10 (30.3)
Bilateral breast	5 (15.2)
Side unspecified	4 (12.1)
Total	33 (100)

Table 2: Age distribution of male breast cancer

Age group	Bilateral breast	Breast NOS	Left breast	Right breast	Total
20-29	2	0	0	0	2
30-39	3	0	3	2	8
40-49	0	0	1	4	5
50-59	0	0	2	6	8
60-69	0	2	2	2	6
70-79	0	2	0	0	2
80-89	0	0	1	0	1
\geq 90	0	0	1	0	1
Total	5	4	10	14	33

NOS: Not otherwise specified

Invasive carcinoma NST occurred most frequently in the right breast which accounted for 43.3% (13/30) of the cases, while 33.3% (10/30) left breast is involved. In 16.6% (5/30) of the cases, both left and right breast were involved. Breasts were involved, while in 6.6% (2/30) of the invasive carcinoma NST cases, the side was not specified.

DISCUSSION

Relative to the disease in females, male breast cancer is rare, accounting for <1% of all cases of breast carcinoma with an incidence of 1 in 100,000 men in Europe.^[15] The National Cancer Institute Surveillance, Epidemiology, and End Results Program noted that the incidence of male breast cancer increased by 26% from 1973 to 1998.^[16] The annual incidence in Japan is <5 per million, in parallel with the lower than average incidence of female breast cancer in that country. In central African countries, a substantially higher proportion of male breast cancer cases (6%–15%) have been reported. The relatively high rates have been attributed to endemic infectious diseases causing liver damage, leading to hyperoestrogenism.^[17] The reasons for this geographic variability in male breast cancer remains unclear. The etiology of male breast cancer remains as poorly understood as that of female breast cancer, but genetic disorders and an imbalance by various mechanisms in the estrogen-testosterone ratio are probably implicated.^[10,18,19]

This study shows that male breast cancer comprises 4.3% of all cases of breast cancers diagnosed during the study period. This is similar to a study carried out by Dogo *et al.*, in Borno state,^[20] the North-Eastern part of the country, and Ahmed *et al.*, in Zaria^[21] who found male breast cancer constituting

Table 3: Frequency distribution of histologic types of male breast cancer

Histological types	Bilateral breast	Breast NOS	Left breast	Right breast	Total (%)
Invasive carcinoma NST	5	2	10	13	30 (90.9)
Invasive lobular carcinoma	0	1	0	1	2 (6.1)
Mucinous adenocarcinoma	0	1	0	0	1 (3.0)
Total	5	4	10	14	33 (100)

NST: No special type, NOS: Not otherwise specified

3.7% and 9%, respectively. The reasons for such disparity were not concluded from our study. Studies conducted in India, by Park et al.,^[1] and in Korea by Panda et al.,^[22] reported lower frequency of 2.40 and 0.38%, respectively.

Our findings reveal that invasive carcinoma NST was the most common histological variant of male breast cancer and constituted 90.9% of all diagnosed cases. This confirms the works of other researchers including Dogo *et al.*, Park *et al.*, and Ahmed *et al.* that invasive ductal carcinoma is the most common histological type.^[20-23] Our study also showed the mean age of patients' presentation to be 49.7 years and the peak ages in the 4th and 6th decade of life. This is particularly worrisome because our patients present at a much lower age compared to international data where the peak age is between 61 and 71 years.^[24]

Fifteen percent to 20% of men with breast cancer report a family history of breast or ovarian cancer.^[25] It is estimated that approximately 10% of men with breast cancer have a genetic predisposition, and BRCA2 is the most clearly associated gene mutation.^[26,27] BRCA1 mutation is also associated,^[28] and associations have also been suggested for PTEN, P53, and CHEK2.^[29,30] Klinefelter's syndrome (XXY) has been described in the literature as occurring in 3% to 7.5% of men with breast cancer.^[31]

Other well-described risk factors for breast cancer in men include age, race, and radiation exposure. Caucasians men have an incidence of 1.1 per 100,000, and Negroes men have an incidence of 1.8 per 100,000.^[25] A cohort of atomic bomb survivors showed a male breast cancer rate of 1.8 per 100,000 person-years.^[32] Support for associations with other risk factors, derived mainly from case-control studies, is less conclusive. These other risk factors include hormonal factors, previous breast cancer, and environmental exposures.^[15]

Data from case-control and cohort studies also suggest that increased estradiol levels are associated with male breast cancer. Cirrhosis of the liver, obesity, and exogenous estrogen result in increased circulating estrogen levels and therefore may contribute to an increased risk of male breast cancer.^[15,33] There are also possible associations with testicular abnormalities, which are thought to be a result of low testosterone levels and alteration of the ratio of androgens to estrogens.^[5] In another study, obesity was also a significant risk factor. Men with a body mass index of >30 had an 80% increased risk compared with men with a body mass index of <25. Conversely, men who were physically active, especially in adolescence, were at

a reduced risk although this was not statistically significant.^[34]

CONCLUSION

This study has shown that male breast cancer is not "extremely" rare as a prevalence of about 4% cannot be easily overlooked. This study has also helped to establish baseline data for this neoplasm and will aid further research in this field in our environment. Because of the paucity of information and data on male breast cancers as compared to female breast cancers, there are windows of opportunities to explore these lesions and have answers.

Although the incidence of breast cancer is much lower in men than in women, it may be possible to identify a cause that is common to both men and women, which may be relevant to prevention in both sexes. There is also a need for studies that address how biomarkers may relate to male breast cancer, particularly with regard to endogenous hormones, and how these relate to some of the identified risk factors such as obesity, physical activity, and bone fractures. Ongoing work in genome-wide association studies will likely provide further information regarding the genetic basis of male breast cancer. In addition, a need to study and match risk factors in both sexes is highly recommended.

Due to the rarity of the cancer, the sample size is often very small to observe an association between the risk factors and cancer. Because of its low incidence, male breast cancer has not been studied as extensively as female breast cancer. Most studies related to male breast cancer are retrospective analyses with a small number of patients. Appropriate management guidelines for male breast cancer have not yet been clearly established, and limited information is available regarding the epidemiology, treatment, and prognosis of the disease.^[1,22] Furthermore, a need to establish management protocols for male breast cancers is obvious, especially in the face of rising global incidence.

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Conflicts of interest

There are no conflicts of interest.

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