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Original Article

Epidemiology of Breast Cancer in a Tertiary Care Hospital of Bangladesh

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Abstract

Background: The world burden of newly diagnosed breast cancer is almost one million women in each year. This study aimed to investigate age-specific incidence rates with epidemiology of breast cancer.

Methods: This descriptive cross-sectional study was conducted in the Department of Surgery, Chittagong Medical College Hospital after ethical clearance obtained. A total of 75 patients were enrolled in the study from February 2009 to January 2010. All consecutive female breast cancer patients were included except carcinoma of the male breast and recurrent female breast cancer. Data was analysed by Microsoft Office 2007 software.

Results: Highest incidence (52%) was observed in the 31-40 years age group and then gradually declined with the increasing age giving a characteristic of inverted V- shaped curve. Majority of patients (49.3%) presented in an advanced stage (Stage III).

Conclusion: The finding suggested that breast cancer screening protocol should be redefined and should start at an earlier age particularly for the high-risk groups.

Keywords: Breast Cancer, Cancer Stage, Cancer Screening, Cancer Risk Factors

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Introduction

One in ten all new cancers diagnosed worldwide each year is a cancer of the female breast.[1] It is the most common cancer among woman in both high resource and low resource setting.[1] It is the primary cause of cancer death among woman globally responsible for about 375,000 in 2000. There is at least tenfold variation in breast cancer incidence rates worldwide largely as a consequence of socioeconomically correlated differences in the population.[2] Breast cancer remains a critical health challenge globally, as it is the most frequently diagnosed malignancy among women and the foremost cause of cancer-related mortality across various socioeconomic contexts.[1] In developed regions, age-related incidence rates of breast cancer have shown a decline; however, developing countries are experiencing a notable increase.[3] This shift is likely linked to the westernization of lifestyle factors, including altered reproductive patterns, dietary changes, and increased exposure to exogenous estrogens.[2] Consequently, the epidemiological profile of breast cancer in these regions is aligning more closely with that of populations in industrialized nations.[4] Despite the scarcity of comprehensive, high-quality longitudinal cancer data in many developing areas, available statistics indicate a rising trend in breast cancer incidence and mortality, particularly in countries like India and Singapore.[1] In Western populations, breast cancer incidence typically exhibits a linear increase correlating with age. In contrast, Asian countries demonstrate an inverted V-shaped incidence curve, peaking around the age of forty, followed by a subsequent decline.[5] With increased public awareness that breast cancer can develop in relatively young woman, concern has been raised that the disease is increasing in women in their forties.[4]

Bangladesh is no exception in facing the ongoing threat of breast cancer. Every year in Bangladesh approximately 35000 women develop breast cancer many of whom never seek treatment.[6] Prompt diagnosis and treatment provides the best chance of long term survival but for many reason Bangladeshi women do not seek treatment early and often presented at an advanced stage of the disease.[6] However, precise data on the incidence rate of breast cancer in the country is lacking. This study aims to address this gap by investigating age-specific incidence rates and epidemiology of breast cancer within the Chittagong region. The Chittagong Medical College Hospital serves a large patient demographic from the Chittagong division, which shares

analogous population and demographic characteristics with the broader Bangladeshi context. Thus, the findings from this study may provide valuable insights into the overall trend of breast cancer in Bangladesh.

Materials and Methods

A descriptive cross-sectional study was conducted in the Department of Surgery at Chittagong Medical College Hospital from February 2009 to January 2010 to examine the age-related incidence and epidemiology of breast cancer in the Bangladeshi population. The study enrolled a total of 75 female patients diagnosed with clinically evident breast cancer. Data collection was performed prospectively upon hospital admission, utilizing a standardized Case Record Form designed to capture comprehensive patient histories. This included detailed demographic data, menstrual and reproductive history, as well as specific findings from the physical examination of the breast. The assessment focused on tumor localization, size, and its adherence to the skin and underlying musculature. Additionally, regional lymph nodes were palpated for metastatic involvement, and a thorough clinical evaluation for distant metastasis was undertaken. Inclusion criteria consisted solely of female patients with clinically diagnosed breast cancer, whose diagnoses were subsequently validated through fine needle aspiration cytology (FNAC) or histopathological examination. Radiological investigations, including chest X-ray (CXR), ultrasound, and bone scans, were employed to evaluate for potential distant metastases as clinically indicated. Notably, male patients and those with recurrent breast cancer were systematically excluded from the study. A consecutive sampling approach was utilized for patient selection, and informed consent was obtained from all participants. Staging, typing, Histopathological and simple classification stated were followed during analysis.

Staging of Breast Cancer

The most widely used system for staging primary breast cancer has evolved from classifications proposed by the International Union Against Cancer (UICC) and the American Joint Committee on Cancer (AJCC). TNM classification is the basis of overall staging procedure.

T (Primary Tumor)[7]

Tx—Primary tumor can not be assessed
T0—No evidence of primary tumor
Tis—Carcinoma in situ
T1—Tumor 2 cm or less in greatest dimension
T2—Tumor more than 2 cm but not more than 5 cm in greatest dimension
T3—Tumor more than 5 cm in greatest dimension
T4—Tumor of any size with direct extension to chest wall or skin

N (Regional Lymph Node)[7]

Regional lymph nodes means ipsilateral axillary nodes and internal mammary nodes
Nx—Regional lymph nodes cannot be assessed.
N0—No regional lymph node metastasis
N1—Metastasis to mobile axillary lymph nodes
N2—Metastasis to axillary nodes that are fixed to one another
And to other structures
N3—Metastasis to ipsilateral internal mammary nodes

M (Distant Metastasis)[7]

MX—Presence of metastasis cannot be assessed
M0—No distant metastasis
M1—Distant metastasis

AJCC/ UICC Stage Grouping

STAGE 0-------Tis, No, Mo.
STAGE I------- T1, No, Mo.
STAGE IIa-----T0, N1, M0; T1, N1, M0; T2, N0 , M0.
STAGE IIb-----T2, N1, M0; T3, N0, M0.
STAGE IIIa----T0, N2, M0; T1, N2, M0; T2, N2, M0; T3, N1, M0; T3, N2, M0.
STAGE IIIb---T4, any N, M0; any T, N3, M0.
STAGE IV-----any T, any N, M1.

Types of Breast Cancer

Modern classification of breast cancer attempts to recognize morphologic patterns that reflect both the histogenesis of malignancy and its biologic behavior or prognosis. Considering the staging and grading of breast cancer it is classified in to two types-
a) Early Breast Cancer and b) Advanced Breast Cancer.

Early Breast Cancer

It was defined as tumors of less than 5 cm (T1, T2) with either impalpable (N0) or palpable but not fixed lymph nodes (N1) with no distant metastasis (M0) and with tumors of more than 5 cm (T3) but nodal or distant metastasis that correspond to stage I, IIa, IIb.[8]

Advanced Breast Cancer

The following are characteristics of advanced carcinoma-edema, redness, nodularity or ulceration of the skin, the presence of large primary tumor, fixation to the chest wall, enlargement, shrinkage or retraction of the breast, marked axillary lymphadenopathy, fixed to one another or to the skin, edema of the ipsilateral arm or distant metastasis.[9]

Histopathological classification of breast cancer

Malignancies of the breast are broadly classified into epithelial cells lining ducts and lobules and nonepithelial malignancies of supporting stroma.[10] Epithelial tumors are again divided according to their evolution into invasive and noninvasive cancers.

A Simple Classification and Distribution of Histologic Types of Breasts Cancer[11]

IN SITU CARCINOMA	15%-30%
Ductal carcinoma in situ	80%
Lobular carcinoma in situ	20%
INVASIVE CARCINOMA	70%-85%
Ductal carcinoma (no special type)	79%
Lobular carcinoma	10%
Tubular carcinoma	6%
Colloid carcinoma	2%
Medullary carcinoma	2%
Papillary carcinoma	1%

Upon conclusion of data collection, the data underwent rigorous cleaning, compilation, and statistical analysis. Data was analysed by Microsoft Office 2007 software. The outcomes were systematically presented in tables, graphs, and charts for clarity and comprehension.

Results

Table 1: Demographic Characteristics of Breast Cancer Patients (N=75)

Attributes	Number of patients	Percentage
Age group (in years)		
21-30	6	8
31-40	39	52
41-50	19	25.3
51-60	7	9.3
61-70	3	4
>70-74	1	1.4
Religion		
Muslims	66	88
Hindus	8	10.7
Buddhists	1	1.3
Occupation		
Housewife	67	89.3
School Teacher	3	4
Service Holder	5	6.7
Marital status		
Married	73	97.3
Unmarried	2	2.7
Onset of Menarche (years)		
10-11	6	8
12-13	52	69.3
14-15	17	22.7
Age at menopause (Years)		
36-40	4	5.3
41-45	11	14.7
>45	9	12
Not in menopause	51	68
Having children*		
Multiparous	71	87.3

*2 was unmarried, 2 nulliparous

(Table 1) stated that the youngest patient in this study is 21 years old and the eldest 74 years. Highest incidence in age group 31-40 years (52%); sixty-seven patients were housewives; seventy-three patients were married and only two were unmarried. The age of onset of menstruation varies among individual patients. Onset of menarche of 52 patients was between 12-13 years of age which is 69.3% of total cases. Majority of the patients (51) haven't established menopause yet. Of the 24 patients who established menopause 4 patients were 36-40 years, 11 patients were 41-45 years age group, and the rest were more than 45 years of age.

Table 2: Risk Factors related to Breast Cancer (N=75)

Attributes		Number of patients	Percentage
Exogenous hormone Usage history			
Oral contraceptives		41	57.7
Hormone replacement therapy		0	0
None		34	42.3
History of Breast Feeding			
Suckled breast		70	98.6
Unsuckled breast		1	1.4
Total		71	100
Family history			
Present		2	2.7
Absent		73	97.3
Total		75	100
History of previous breast disease			
Present		5	6.7
Absent		70	93.3
Total		75	100
Presenting symptoms			
Lump with Duration (months)	<3	16	21.3
	3-12	36	48
	>12	23	30.7
Pain		50	66.7
Nipple discharge		14	18.7

(Table 2) revealed that, among seventy-five patients forty-one patients used oral contraceptives. No patients has ever received any hormone replacement therapy. Seventy patients complied with the breast feeding practice. Of the seventy-five patients, only two patients has a positive family history. Interestingly one has her daughter previously diagnosed as breast cancer. Only five patients of this study had previously suffered from some kind of breast disease in the form of fibrocystic disease or fibroadenoma. The remaining seventy patients has no such history. Seventy five out of seventy five i.e. 100% presented with a lump in their breast; 23 of this patients has their lump for more than one year. The lump was painful in 50 patients which constitutes 66.7%; 14 patients had nipple discharge which constitutes 18.7% of total cases.

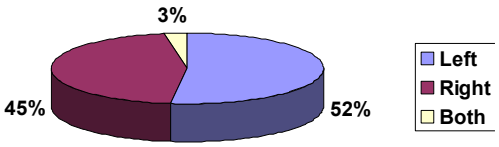

Figure 1: Incidence of Breast Cancer According to the Involvement of Breast

In this study 39 cases (52%) were having primary tumor in the left breast and 34 cases (45.3%) were having primary tumor in the right breast. Only 2 cases (2.7%) presented with bilateral involvement.

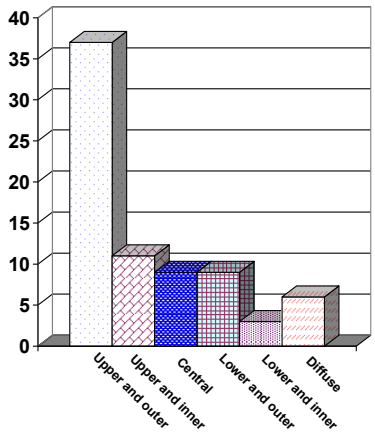

Figure 2: Showing Number of Patients with Involvement of Different Quadrants of Breast

Upper and outer quadrant was involved in most of the cases, 37 had involvement in this quadrant followed by upper and inner quadrant which was involved in 11 patients. Central involvement was in 9. The lowest involved quadrant was obviously lower and inner with only 3 cases.

Table 3: Histopathological Typing, Staging and Lymph Node Involvement of the Disease

Attributes	Number of patients	Percentage
Type of cancer by histopatholgy		
Duct cell carcinoma	73	97.4
Medullary carcinoma	1	1.3
Lobular carcinoma	1	1.3
Stage of disease		
Stage I	1	1.3
Stage II	26	34.7
Stage III	37	49.3
Stage IV	11	14.7
Size of tumor (number)	**Involved**	
T1 (2)	0	0
T2 (13)	8	61.5
T3 (18)	10	55.5
T4 (42)	35	83.3

Histopathology reports were collected from all the patients who were operated. Those who were not operated FNAC reports were taken. 73 patients (97.4%) had duct cell carcinoma, one patient had medullary carcinoma and another patient had lobular carcinoma. Seventy five cases (49.3%) of patients were in stage III, followed by stage II in 34.7% and stage IV in 14.7% of patients. Only one patient present in stage I. Regional lymph node involvement increases with increase in the tumor size. 61.5% of T2 cases, 55.5% of T3 cases and 83.3% of T4 cases had regional lymph node involvement. In T1 cases no lymph node was involved (Table 3).

Discussion

The present study is a descriptive analysis of the present trend of breast cancer in a geographical region of Bangladesh. Our study found breast cancer was mostly common in the age group 30 to 40 years which is 52% followed by age group 40-50 years (25.3%). This findings alligns with other studies.[12,13] Other study reported that the incidence of breast cancer increases as the age increases.[12] Previously in USA and other western countries the age distribution at diagnosis is bimodal with a dominant peak frequency near the age 50 years and a smaller mode near age 70 years. It is shown by Anderson *et al* (2007) that during 2000 to 2003 this distribution has returned to predominantly younger age at onset with a peak frequency still at 50 years.[12] Amit *et al* in a five year clinicopathological study between 1997 to 2002 in India found breast cancer most common in 30-40 years age group 17 and Saxena *et al* also in India found the average age was 47.9 years.[13] A case control study in Mumbai, India indicate that single woman compared to married women has a 4-5 fold higher risk and nulliparous woman had a 2.2 fold higher risk than parous women for development of breast cancer.[13] In our study only two cases (2.7%) were found to be unmarried and only two (2.7%) married women were nulliparous. In this study most have their first baby in between 16-25

years (73.2%) whereas only two (2.8%) has delivered first after 30 years. Compared to controls, women with breast cancer are more likely to have a long reproductive life with early age of menarche and late age at menopause and to have fewer children. In this series the age of onset of menarche in most cases (69.3%) is 12-13 years and of the 24 patients who develop menopause 15 of them develop it before 45 years. Only 38.4% of patients have 1-2 children. Kahlenborn *et al* in a meta-analysis in 2006 has shown that the use of oral contraceptives is associated with an increased risk of pre-menopausal breast cancer, especially with use before first full term pregnancy in parous women.[14] In our study, 41 patients (57.7%) use oral contraceptives which is in agreement with the study of Kahlenborn *et al*., However not a single woman in our study has used hormone replacement therapy (HRT). Biglia N *et al*., and many others have shown that HRT increases the incidence of lobular breast cancer.[15]

Hollander *et al* has shown that for every 12 months a woman breast fed her risk of breast cancer declines by 4%.[16] This is in contrast to our study where 98.6% patients have their breasts suckled. Family history is another risk factor or breast cancer. It has been noted that women who have first degree relatives with breast cancer have a risk two to three times than that of general population.[13] In present study we have found that the incidence of breast cancer is remarkably high in young patients. Incidence is 52% in the age group of 31 to 40 years. More than two thirds of these patients are present at an advanced stage of disease. So the present trend of breast cancer is that it is affecting young productive women in whom sensitivity of mammography as a screening modality is low. Our utmost priority should be to improve the survival in this group of patients. Considering the economic status of our country, clinical breast examination and breast self-examination are the possible options for early diagnosis. Women as young as 15 years may be encouraged to do breast self-examination on a regular basis for early detection of breast cancer.

Conclusion

This present study is a hospital-based study with a total number of seventy-five cases. An attempt has been made in this study to find out the age incidence among patients admitted with breast cancer. This study has shown a high incidence of breast cancer at the young age group. Many of these patients presented at an incurable state of disease. As a result, we are losing many young mothers.

Ethics Approval: Before data collection, both verbal and written informed consent was taken from patients.
Consent for Publication: All authors have approved this manuscript for publication.
Competing Interests: The authors declare that they have no competing interests.

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Authors' Contributions
NFI, MI participated in the design of the study, data interpretation and drafted the manuscript. NFI, MI contributed to the data design, data interpretation and data analysis. NFI, NFI, MI did critical review of the manuscript.

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