Association between Clinical Features and Risk Factors for Breast Cancer through a Cross-Sectional Study

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Abstract

Introduction: Breast cancer was responsible for 685,000 deaths worldwide in 2020. Approximately half of all breast cancers arise in women who have no identifiable risk factors other than their gender and age. Objectives: The goal of this study was to determine the association between clinical features and breast cancer risk factors.

Methods: This cross-sectional study was conducted among 50 histologically confirmed breast cancer patients included by purposive sampling technique in the Surgery Department of Rangpur Medical College, Rangpur.

Results: The presence of breast lump was significantly associated with the residence of patients (p value<0.011).

The significant association between nipple retraction and family history may indicate a hereditary predisposition that affects the course of the disease (p value<0.031).

Conclusion: This research provides insights into vital aspects of breast cancer within a particular demographic, under scoring the necessity for focused approaches to public health to address the discrepancies in breast cancer presentation and outcomes.

Keywords: Risk Factors for Breast cancer, Clinical features of Breast cancer, Bangladeshi breast cancer patients

Introduction

Being a complex illness, breast cancer is the second largest cause of death for women globally and one of the most prevalent types of cancer.[1] Because of its unpredictable nature and the numerous gaps in our understanding of the variables that either regulate or impact tumour genesis and progression, breast cancer continues to confound surgeons and pathologists.[2]

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After stomach, liver, lung, and colon cancers, breast cancer ranks as the fifth most common cause of cancer-related deaths globally.[3] Breast cancers are categorised histologically according to features that are analysed using light microscopy on biopsy tissues. The terminal duct lobular unit (TDLU) is an important component as site of breast cancers origin.[4]

A lump that differs from the rest of the breast tissue is usually the initial sign of breast cancer. Additional manifestations include breast tissue that is thicker than the surrounding tissue, one breast growing larger or smaller, nipple position or shape changes, skin dimpling, discharge from the nipples, persistent pain in a particular area of the breast or armpit, or swelling under the armpit.[5]

Breast cancer is caused by both hereditary and non-hereditary causes. The bulk of hereditary breast cancer cases are thought to be caused by the BRCA1 and BRCA2 mutations. The female sex and age are the most important non-hereditary factors that lead to breast cancer. Menarche, age at menopause, age at first childbirth, number of births, breast feeding, smoking, radiation exposure, oral contraceptive and postmenopausal hormone use, fatty diet, and obesity are also risk factors. Of all the risk factors, the highest correlation is found in the presence of breast cancer in the family. It's critical to increase patient awareness and do routine follow-up with these patients.[6]

Epidemiological research at the regional and global levels indicates that this cancer strikes Indian and Asian women at a younger premenopausal age than western women, who get it a decade or more later.[7] Previous epidemiological research has generally linked high parity to a lower risk of breast cancer. Early first childbirth has been linked to a lower incidence of breast cancer, although the predictive usefulness of first childbirth age is less apparent.[8] Age of menarche is a well-established breast cancer risk factor, with each two-year increase in age at menarche resulting in a 10% reduction in breast cancer risk.[9] Studies on the risk of breast cancer in women who use hormonal contraception produce inconclusive results, ranging from no increase in risk to an increase in risk.[10]

South Asia, which is home to nearly 588 million women over the age of 15, is facing a growing breast cancer crisis as the prevalence of breast cancer rises drastically. In South Asia, there is a scarcity of information on the epidemiology, biology, and various environmental causes of breast cancer. There are no central cancer registries in South Asian countries that could give comprehensive countrywide data.[11]

The clinical behaviour, histopathology appearance, and molecular abnormalities of breast tumours differ widely. Specific epidemiologic risk factors that differ by clinically important tumour characteristics may help to establish targeted preventative initiatives.[12] The goal of this study was to determine the association between clinical manifestations and breast cancer risk factors. Breast cancer control in Bangladesh is a difficult task fraught with difficulties. Because we lack a cancer registry and appropriate statistics, determining the severity of the current issue is challenging. However, this study can help improve information of the link between risk variables and clinical manifestations of breast cancer.

Materials and Methods:
This observational type of cross sectional study was conducted among 50 histologically confirmed breast cancer patients included by purposive sampling technique in surgery department of Rangpur Medical College, Rangpur during the period of June 2018 to May, 2019. This study was approved by Ethical Review Committee. After taking informed written consent data were collected by face to face interview and reviewing medical records from each patient by using a pre-tested

semi-structured questionnaire and check list respectively which was included particulars of the respondents, socio demographic information and information about risk factors and clinical presentations. Patients with benign breast diseases were excluded. Ethics was maintained strictly at different stages of this study. After data collection data were checked thoroughly for any inconsistency and incompleteness. Then analysis done by SPSS 25 software. Descriptive statistics were presented by mean, frequency, percentage and standard deviation in table, graphs and charts and inferential statistics were presented by chi-square. *P* value <0.05 was determined to be statistically significant.

Results
The results and observations are given below. All tables are added in separate dox file

Table-I

Distribution of patients by socio-demographic characteristics		
Characteristics	Frequency	Percentage
Age (in Years)		
20-30	04	08
31-40	04	08
41-50	32	64
51-60	06	12
61-70	03	06
>70	01	02
Residence		
Urban	10	20
Rural	40	80
Socio-economic status		
Upper income	00	00
Middle income	08	16
Low income	42	84

The mean age of the patients was 43.74±14.99. Majority i.e. 32 (64%) of the patients were in the age group 41-50 years and 6 (12%) of respondents were in the age group 51-60 years. Maximum i.e. 40 (80%) and 42 (84%) of patients were from rural area and belonged low socio-economic status respectively shown in Table -1.

Table-II

Distribution of the patients according to their risk factor (n=50)

Characteristics	Frequency	Percentage
Family History		
Positive	14	28
Negative	36	72
Use of Contraceptive		
Yes	38	76
No	12	24
Age of menarche		
<12 years	41	82
>12 years	09	18

Family history was found positive 28% cases, use of contraceptive was positive in 76% cases and age at menarche was <12 years in 82% cases shown in Table-II

Table-III

Clinical manifestations of patients (n=50)

Characteristics	Frequency	Percentage
Breast lump size		
>2-<5 cm	13	26
>5 cm	37	74
Presence of Nipple Retraction		
Present	33	66
Absent	17	34
Axillary lymph node		
Present	30	60
Absent	20	40
Lymph node		
Fixed	24	48
Not fixed	26	52
Breast lump site		
Upper outer quadrant	20	40
Upper inner quadrant	12	24
Lower outer quadrant	09	18
Lower inner quadrant	03	06
Sub areolar	04	08
Axillary tail	02	04
Breast lump fixity		
Fixed	08	16
Not fixed	42	84

Among the patients 74% had >5cm of breast lump, Nipple retraction was positive in 66% cases, axillary lymph node was present in 60% cases, Fixity of lymph node was 48% cases, majority i.e. 40% of patients had breast lump in upper outer quadrant and breast lump fixed to chest wall was found only 8% cases shown in Table-III.

Table-IV

Association between common risk factors and size of the breast lump (n=50)

Risk factors	Size of the breast lump		P Value
	>2-<5 cm (n=13)	>5 cm (n=37)	
Age (Years)			
20-30	01	03	
31-40	01	03	
41-50	08	24	0.987
51-60	02	04	
61-70	01	02	
>70	00	01	
Residence			
Urban	03	07	0.747
Rural	10	30	
Socio-economic status			
Low	11	31	0.944
Middle	02	06	
Upper	00	00	
Family history			
Yes	04	10	0.769
No	09	27	
Use of contraceptives			
Yes	09	29	0.506
No	04	08	
Age at menarche			
<12 years	12	29	0.261
>12 years	01	08	

Table-4 Shows none of above risk factors was significantly associated with size of the breast lump.

Table-V

Association between common risk factors and nipple retraction of the patients (n=50)		

Risk factors	Nipple retraction		P Value
	Yes (n=33)	No (n=17)	
Age (Years)			
20-30	02	02	
31-40	03	01	
41-50	21	11	0.952
51-60	04	02	
61-70	02	01	
>70	01	00	
Residence			
Urban	03	07	0.007*
Rural	30	10	
Socio-economic status			
Low	29	13	0.297
Middle	04	04	
Upper	00	00	
Family history			
Yes	06	08	0.031*
No	27	09	
Use of contraceptives			
Yes	26	12	0.520
No	07	05	
Age at menarche			
<12 years	27	14	0.963
>12 years	06	03	

Table-V Shows family history (*p*=0.031) was significantly associated with nipple retraction.

Table-VI

Association between common risk factors and axillary lymph node (n=50)		

Risk factors	Axillary lymph node		P Value
	Present (n=33)	Absent (n=17)	
Age (Years)			
20-30	02	02	
31-40	02	02	
41-50	19	13	0.948
51-60	04	02	
61-70	02	01	
>70	01	00	
Residence			
Urban	05	05	0.470
Rural	25	15	
Socio-economic status			
Low	25	17	0.875
Middle	05	03	
Upper	00	00	
Family history			
Yes	08	06	0.797
No	22	14	
Use of contraceptives			
Yes	23	15	0.892
No	07	05	
Age at menarche			
<12 years	25	16	0.764
>12 years	05	04	

Table-VI Shows none of above risk factors were significantly associated with axillary lymph node.

Table-VII

Risk factors	Fixity of lymph node		P Value
	Fixed (n=24)	Not fixed (n=26)	
Age (Years)			
20-30	02	02	
31-40	02	02	
41-50	15	17	0.926
51-60	03	03	
61-70	02	01	
>70	00	01	
Residence			
Urban	04	06	0.571
Rural	20	20	
Socio-economic status			
Low	20	22	0.902
Middle	04	04Upper	00 00
Family history			
Yes	06	08	0.650
No	05	07	
Use of contraceptives			
Yes	19	19	0.614
No	05	07	
Age at menarche			
<12 years	20	21	0.814
>12 years	04	05	

Association between common risk factors and fixity of lymph node (n=50)

Table-VIII

Association between common risk factors and site of the breast lump (n=50)

Risk factors	Site of the breast lump						P value
	Upper outer	Upper inner quadrant	Lower outer quadrant	Lower inner quadrant	Subareolar quadrant	Axillary	tail
Age (Years)							
20-30	01	01	02	00	00	00	
31-40	04	00	00	00	00	00	
41-50	10	07	07	03	04	00	0.68
51-60	03	02	00	00	00	01	
61-70	02	01	00	00	00	00	
>70	00	01	00	00	00	00	
Residence							
Urban	04	02	00 03	01	00	0.011 *	
Rural	16	10	09 00	03	02		
Socio-economic status							
Low	15	10	09 03	03	02		
Middle	05	02	00 00	01	00	0.533	
Upper	00	00	00 00	00	00		
Family history							
Yes	07	00	04	02	01	00	0.095
No	13	12	05	01	03	02	
Use of contraceptives							
Yes	14	10	07	02	04	01	0.714
No	06	02	02	01	00	01	
Age of menarche							
<12 years	18	10	06 02	04	01	0.644	
>12 years	02	02	03 01	01	00		

Table-VII Shows none of above risk factors were significantly associated with fixity of lymph node.

Table-VIII Shows only residence was significantly (*p*=0.011) associated with site of the breast lump.

Table-IX

Association between common risk factors and breast lump fixed to chest wall (n=50)

Risk factors	Breast lump fixed to chest wall		P Value
	Fixed (n=08)	Not fixed (n=42)	
Age (Years)			
20-30	00	04	
31-40	01	03	
41-50	05	27	0.867
51-60	01	05	
61-70	01	02	
>70	00	01	
Residence			
Urban	01	09	0.563
Rural	07	33	
Socio-economic status			
Low	08	34	0.178
Middle	00	08	
Upper	00	00	
Family history			
Yes	03	11	0.514
No	05	31	
Use of contraceptives			
Yes	06	32	0.942
No	02	10	
Age at menarche			
<12 years	08	33	0.148
>12 years	00	09	

Table-IX Shows none of above risk factors were significantly associated with fixity of breast lump to chest wall.

Discussion:
This study sheds light on the demographics, risk factors, and clinical manifestations of breast cancer in a specific set of populations. The majority of participants were from rural areas, between the ages of 41 and 50, and had poor socioeconomic levels, which highlights a potentially vulnerable population profile. These results are consistent with those of an earlier study into epidemiological determinants of breast cancer in Bangladesh.[13] Globally, this age range is typically associated with an elevated risk of breast cancer.[14] Living in a remote area may be somewhat difficult when it comes to accessing healthcare. There are fewer screening facilities, longer distances to drive for care, and fewer specialist healthcare professionals available. Low socioeconomic position exacerbates these problems because it is frequently associated to lower health literacy, which can lead to delayed diagnosis and treatment.

The high incidence of risk factors like contraceptive use, and early menarche is notable. Multiple studies have established that a family history of the disease doubles the risk of developing breast cancer.[15] However, the absence of a reported family history of breast cancer in patients in Bangladesh is also found in previous studies.[16] This underreporting may be attributed to several factors. Primarily, limited availability of cancer diagnostic services and healthcare, especially in rural regions, may contribute to a dearth of comprehensive family histories. Furthermore, there's a chance that people are unaware of the importance of family history in regards to breast cancer risk. In low to middle income country like Bangladesh record-keeping practices and access to medical information are frequently inadequate, which contributes to the absence of documented family histories of breast cancer. On the other hand, this group may have decreased genetic predisposition due to inherited mutations which is needed to explore with further longitudinal studies.

The clinical presentations observed in the study that, rural patients were more found to have breast lump than urban patients (*p*=0.011). Education level and lack of awareness might be the cause of high percentages of breast lump found in rural patients.[17] The majority of breast lumps measuring more than 5 cm indicated a delayed diagnosis, which is a significant barrier in performing the surgery of cancer mass. A lack of education, insufficient screening programs, or cultural issues that cause people to wait before seeking medical attention could all contribute to this delayed presentation. In addition, Axillary lymph nodes and gland retraction are signs of more advanced disease, further complicating the treatment of malignancy.[18]

Some significant findings were obtained from the investigation of the relationship between different risk variables and clinical presentations in this study. The significant association ($p<0.031$) between nipple retraction and family history indicated that a hereditary predisposition might affected the course of the disease. Nipple retraction and positive family history play vital role for development of breast cancer.[19, 20]

There are several limitations. The sample size and geographic limitation may affect the generalizability of the findings. Future research should focus on a larger, more diverse sample to validate these findings. Additionally, prospective studies could provide more insight into the progression and outcome of the disease in relation to the risk factors identified.

Conclusion:

In summary, this research provides insights into vital aspects of breast cancer within a particular demographic, underscoring the necessity for focused approaches to public health. In order to address the discrepancies in breast cancer presentation and outcomes, it highlights the significance of early identification and culturally responsive healthcare interventions. This study emphasises the necessity of further research into the intricate interactions between clinical and socio-demographic factors in breast cancer.

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