

## Age Related Patterns and Frequency of Breast Lesions

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Various types of lesions from inflammation to carcinoma can affect the breast. Some lesions are common in younger age while others are more common in elderly subjects. Early presentation and prompt diagnosis is essential to relieve anxiety of non-neoplastic conditions, and in case of carcinoma, it can save the patient from metastases. Analysis of patterns and frequency should provide a valuable guideline for clinical management of these lesions. This study was done to find the patterns and frequency of different breast lesions in both males and females. It was a retrospective cross sectional study conducted in the department of Pathology, Enam Medical College & Hospital, Savar, Dhaka during the period from January 2006 to June 2013. A total of 317 breast biopsies and mastectomies from both female and male patients were selected for histopathological evaluation. There were 314 cases (99%) of female breast and 3 cases (1%) of male breast with a female to male ratio 104.67:1. The mean age of the sample was 32.87 years with age range 12 to 80 years. Inflammatory lesions comprised 61 cases (19.24%), benign breast lesions comprised 182 cases (57.41%) and malignant lesions comprised 74 cases (23.34%). Of the 317 cases fibroadenoma was 40.69% (n=129 cases), invasive ductal carcinoma was 21.45% (n=68 cases), breast abscess was 9.15% (n=29 cases), fibrocystic change was 5.36% (n=17 cases) and chronic mastitis was 3.47% (n=11 cases). Fibroadenoma was common in third decade (45.64%) and invasive ductal carcinoma in fifth decade (36.49%) of life. The commonest breast lesion was fibroadenoma followed by invasive ductal carcinoma and breast abscess.

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**Key words:** Fibroadenoma, Ductal carcinoma, Fibrocystic change

### Introduction

**B**reast is a glandular organ influenced by hormones in females with various structures giving rise to different types of lesions and lumps. Inflammatory lesions are common in lactating females. Benign tumors are frequent in young adults and malignant tumors are

common in older females. Breast diseases are mostly confined to females not only for the hormonal influence but also of their more complex structure and greater volume, whereas male breasts are rudimentary non-functional organs, relatively insensitive to endocrine stimuli and apparently resistant to neoplastic growth.<sup>1</sup>

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Most breast diseases present as a palpable lump, mastalgia and nipple discharge. Although most lumps are benign but the neoplasm constitutes the most important lesions of the female breasts. Due to increased public awareness about cancer, the appearance of a lump causes great concern to the patient. Evaluation and diagnosis of breast diseases involves the triple assessment that is clinical history and examination, radiological imaging and tissue sample taken for either cytological or histological analysis. Ultrasonography and mammography, fine needle aspiration cytology (FNAC) and core biopsy are the investigations of choice for diagnosis of majority of breast conditions but excisional biopsy remains the gold standard for diagnosis.<sup>2</sup>

In Bangladesh, the data available regarding the pattern of various breast lesions is limited. Most studies have found on malignant breast diseases. The aim of this study was to find out the age related patterns and frequency of breast lesions in both males and females.

### Methods

This was a retrospective cross sectional study of surgical specimens from the breast conducted in the Department of Pathology of EMCH, Savar, Dhaka during the period from January 2006 to June 2013. A total of 317 breast biopsies and mastectomies from both female and male patients were selected for histopathological evaluation.

The specimens were fixed in 10% formalin, processed as per routine laboratory procedure, embedded in paraffin for the preparation of blocks and sections were stained with the routine haematoxylin and eosin method. The

special stains were prepared whenever necessary.

All histopathology records and available histopathology slides were reviewed and demographic and clinical data were retrieved from histopathology request forms and register regarding name, age and gender of the patient, lesion size, laterality and multiplicity of the lesions and diagnosis. Additional information in cases of malignancy included the status of lymph nodes if axillary lymphadenectomy was done. Patients with more than one specimen for the same lesion were counted once. Patients with multiple or bilateral similar lesions, even if excised at different times, were counted once. Inflammatory conditions affecting the skin overlying the breast were not included. Cases of accessory breast tissue, encountered particularly in the axillae, were excluded. All the data obtained were tabulated and analyzed and histopathologically classified as inflammatory, benign and malignant.

Being a retrospective study, it was not possible to establish exact time period of the onset of the disease, and follow up of the patients was not possible and survival could not be established. By doing prospective study the patients can be properly followed and patients' survival and prognostic factors in malignant cases can be established.

### Results

Out of the total 317 patients of breast disease, 243 (76.66%) had benign breast disease (BBD) and 74 (23.34%) had breast cancer. The benign to malignant ratio was 3.28:1. The mean age was 32.87 years with age range 12 to 80 years. There were 314 cases (99%) of female breast and 3 cases (1%) of male breast

with a female to male ratio 104.67:1. The mean age for females was 32.66 years, range 12 to 80 years, while that of the males was 54.67 years and 37 to 67 years respectively. Majority of the patients were in the age range of 21-30 years (n=109; 34.38%), followed by age range 31-40 years (n=71; 22.4%) and 11-20 years (n=62; 19.56%). Maximum number of cases amongst females (n=109; 34.38%) were in the 3<sup>rd</sup> decade, while amongst males (n=2; 0.63%) in the 7<sup>th</sup> decade of life.

All the breast lesions were filtered and categorized into three main groups: inflammatory breast lesions comprised 61 cases (19.24%), benign breast lesions comprised 182 cases (57.41%) and malignant lesions comprised 74 cases (23.34%). These lesions are depicted according to age groups in Figure 1. With the mean age of presentation for these groups being 30.33 years for inflammatory lesions, 27.88 years for benign lesions and 44.28 years for malignant lesions.

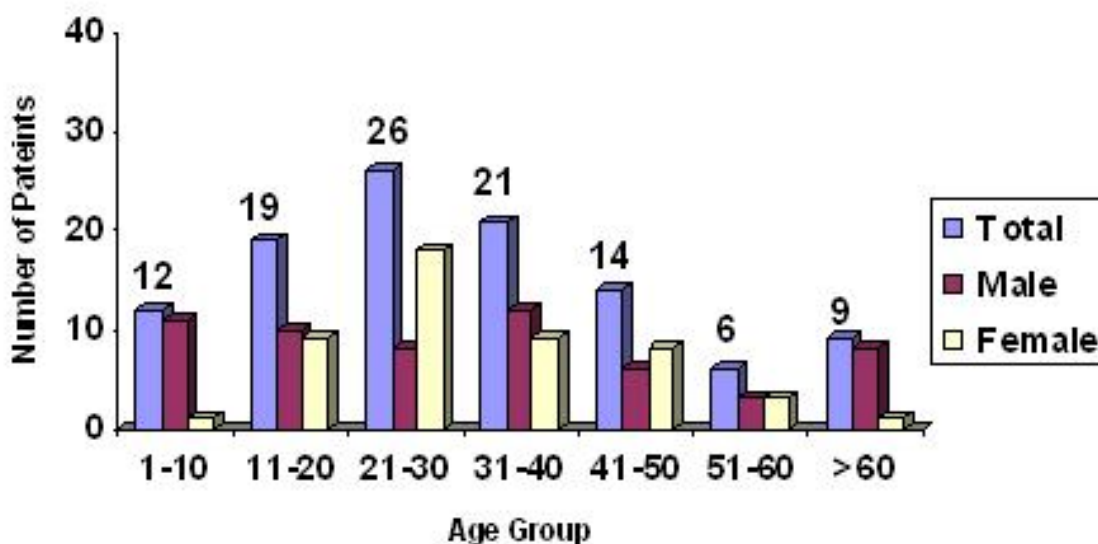


Figure 1. Age distribution of patients with breast disease

Table I: Distribution of benign breast lesions

Type of lesions	Number of Pt	% of Total	Mean Age (Year)	Age Range
<i>Inflammatory lesions</i>				
Abscess	29	9.15	28.62	13-60
Chronic mastitis	11	3.47	30.73	14-55
Granuloma	10	3.15	30.9	17-62
Duct ectasia	6	1.89	34.67	22-48
Galactocele	3	0.95	29.67	27-32
Fat necrosis	2	0.63	38	36-40
Total	61	19.24	30.33	13-62
<i>Benign lesions</i>				
Fibroadenoma	129	40.69	24.46	14-50
Fibrocystic change	17	5.36	37.18	26-50
Adenosis	4	1.26	28	20-35
Epithelial hyperplasia	7	2.21	32.29	20-46
Intraductal papilloma	7	2.21	38.4	26-52
Lactating adenoma	1	0.32	25	
Benign phylloides	1	0.32	58	
Lipoma	1	0.32	45	
Tubular adenoma	1	0.32	26	
Squamous papilloma	1	0.32	25	
Sebaceous adenoma	1	0.32	50	
Normal/Nonspecific	9	2.84	32	19-45
Gynaecomastia	3	0.95	54.67	37-67
Total	182	57.41	27.88	14-67

Table II: Distribution of malignant breast lesions

Type of lesions	Number of Pt	% of Total	Mean Age (Year)	Age Range
Ductal carcinoma	68	21.45	47.3	22-80
Intraductal carcinoma	2	0.63	46	46-50
Lobular carcinoma	2	0.63	25	12-38
Mucinous carcinoma	1	0.32	80	
Medullary carcinoma	1	0.32	52	
Total	74	23.34	47.2	12-80

In the present study, 47% (n=149) cases involved the left sided breast and 39% cases (n=124) involved the right breast; whereas bilateral involvement was seen in 3% (n=3) patients. The side was not recorded in 13% (n=41) patients.

Distribution of different breast lesions according to age is shown in Table I. Fibroadenoma (FA) was the commonest lesion affecting the breast diagnosed in 129 cases (40.69% of all and 70.88% of benign lesions). The age range was between 14 and 50 years with a mean 24.46 years. Most of the patients were in the age range of 21-30 years (n=59; 45.64%), followed by 49 (37.98%) cases in age group of 11-20 years and 127 (98.45%) cases were below 40 years of age. FA occurred at relatively younger age compared to fibrocystic change and duct ectasia, those with two benign lesions had a median age of 37.18 and 38.4 years respectively. There was a left sided preponderance with 58 cases (44.96%) occurring on the left, 50 cases (38.76%) on the right; and 6 (4.65%) had bilateral disease. The side was not recorded in 15 patients (11.63%). Multiple FAs were found in 10

(7.75%) cases, all had two. The mean size was 2.98 cm with range 0.6-8 cm. Twenty-one patients (16.28%) had lesions less than 2 cm in diameter; in 101 patients (78.29%) the size was 2-5 cm, while 7 cases (5.43%) of giant FAs had size more than 5 cm as per definition.

Fibrocystic change, the second commonest benign lesion and ranked third in this series, found 17 cases (5.36% of all) with age range 26-50 years. The peak incidence in the age range 31-40 years. Among other benign lesions include intraductal papilloma 7, epithelial hyperplasia 7 and adenosis 4. There was one case of benign phylloides tumor occurred in a 58 years old female. Normal breast biopsies were also reviewed during the analysis with a total of 9 (2.84%) cases.

Out of the 74 cases of malignant tumors (Table II), the invasive ductal carcinomas (IDC) were the most common comprising 70 cases (22.08% of all). IDC was 68 (21.45% of all) cases and ranked second in this series. There were only 2 cases of intraductal carcinomas. Two cases of lobular carcinomas, one case each of medullary carcinoma and

mucinous carcinoma were found. The age range of the cancers was 12 to 80 years. The youngest patient was a 12-years girl and was diagnosed as an invasive lobular carcinoma in her right breast. The commonest age group was 41-50 years with 27 cases (36.49%), followed by 51-60 years with 19 cases (25.68%) and 31-40 years with 14 cases (18.92%). Six (8.1%) cases were below 30 years age and 8 (10.8%) cases were above 60 years. The mean age of the IDC was 47.3 years with age range 22-80 years.

All the malignant tumors were unilateral and all the patients had single focus or nodule of tumor. Thirty patients (40.54%) had right-sided lesions, another 36 (48.65%) had left-sided lesions. In 8 (10.8%) cases side was not recorded. Both the lobular carcinomas involve the right breasts. The tumor size ranged 1-8 cm with mean 3.41 cm. Size less than 2 cm in 17 (22.9%) cases and more than 2 cm in 57 (77.03%) cases. IDC had a mean size 3.48 cm and lobular with a mean 1.75 cm.

Forty patients (54.1%) underwent mastectomy with axillary lymphadectomy. Sixteen (40%) had negative lymph nodes for metastatic deposits and 24 (60%) had positive lymph nodes. Eleven cases (45.8%) had metastasis in one to three lymph nodes and 13 (54.2%) in more than three lymph nodes.

Among the inflammatory lesions, acute mastitis and breast abscess was the commonest (n=29; 9.15% of all) and constitute the fourth major category in this series. Majority of the lesions were in the age group of 21-30 years (n=17; 5.36%) and 89.66% (n=26) of the patients were less than 40 years of age, reflecting the association of this lesion with pregnancy and lactation.

Granulomatous mastitis was found in 10 cases (3.15% of all) with a mean age 30.9 years and age range 17 to 62 years. Numerous granulomas were found histologically in a background of mixed inflammatory infiltrate. Three cases of tuberculous mastitis were included in this group.

Three cases of breast lesions were found in males, all were diagnosed as gynaecomastia. Two of these involved the right side and one involved the left.

### Discussion

There is a wide spectrum of clinical conditions both benign and malignant which affect the breast from teen age to throughout adult life. Overall, breast problems are commonly seen in females as compared to males.<sup>1,2</sup> Similarly, in this study, females were more affected than males with female to male ratio 104.67: 1.

Benign breast diseases are significantly more common than the malignant conditions worldwide. In this study BBD comprised 76.66% of all breast lumps with a benign to malignant ratio 3.28: 1, which is comparable to other studies,<sup>3,4</sup> but substantially lower than another study.<sup>5</sup>

The most common lesion found in our patients was benign (57.41%), followed by malignant (23.34%) and inflammatory (19.24%). Our results are consistent with other reports regarding the order of frequency of the lesions.<sup>3,6,7</sup> Few of the studies found malignancy as the predominant lesion.<sup>8,9</sup>

The median age of the patients was 32.87 years with age range 12 to 80 years. Most of the patients were in 21-30 years (34.38%) age

group, as reported in other studies.<sup>10,11</sup> Another study found majority patients in 11-20 years age group,<sup>12</sup> still others found in 31-40 years age group.<sup>13</sup>

There was a left sided predominance of disease. About 47% occurred on the left, 39% on the right, while 3% were bilateral. This agrees with many reports.<sup>6,14</sup> Few of the reports also show right-sided predominance.<sup>15</sup>

In agreement with many studies FA was the most common lesion and it constitutes 40.69% of all cases and 70.88% of benign lesions.<sup>7,10,14</sup> Similar frequency of FA was found in some reports.<sup>3,6</sup> But this frequency is much higher than the reported frequency in England<sup>16</sup> (7.7%) and USA whites<sup>1</sup> (7%), but is slightly lower than the reported frequency of 47% and 48% by others respectively.<sup>12,11</sup>

The high frequency of FAs has been reported by some national studies<sup>12,17</sup> as also observed in Saudi Arab<sup>3,10</sup>, India<sup>18</sup> and black American<sup>19</sup> and African females<sup>11,14</sup> and contrast with the lower frequency in Western white females<sup>16</sup>. The cause of high frequency of FA among our females is not clear but racial predisposition could be a factor. Most of our cases were in the 3<sup>rd</sup> decade of life followed by the 2<sup>nd</sup> decade, as also found by others.<sup>10</sup> However, some reported peak incidence in the 2<sup>nd</sup> decade.<sup>11</sup> It is usually a disease of early reproductive life and 98.45% of our cases were below 40 years of age. The mean age of FA was 24.46 years which is similar to 24 years in Iraq<sup>9</sup>, Ghana<sup>11</sup> and 23 years in Saudi Arab<sup>6</sup> and Pakistan<sup>7</sup>. Jamal AA in a series of 1084 cases reported a mean of 28.69 years.<sup>3</sup> Demographic factors might play a role, considering the large number of young females within the population of these groups.

Unilateral FA was reported in 83.7% cases and 92% had solitary lesion. Amr et al found 85.7% of unilateral lesion among the reported cases and 87.6% had solitary lesion.<sup>10</sup>

In accordance with many authors fibrocystic change was the second commonest benign lesion and it ranked fourth in this series.<sup>3,9,10</sup> Others found it to be the most common BBD.<sup>2,20</sup> This is also found as the most common lesion in studies from England<sup>16</sup> (37%) and USA<sup>21</sup> (33.9%). It constitutes 5.36% in our series, which is much lower than 21.1% reported by Amr et al<sup>10</sup> and 25.6% by Istiaq et al<sup>22</sup>. Fibrocystic change consists of a spectrum of morphological changes comprising cysts, adenosis, epithelial hyperplasia, fibrosis and occurs predominantly between the ages of 30 and 50 years.<sup>1</sup> In this series, the age range was 26-50 years, and 76.5% of patients were between 30-50 years age. The mean age was 37.18 years which is similar to 37 years and 38 years found by Abdulkareem et al<sup>9</sup> and Amr et al<sup>10</sup> respectively.

Inflammatory lesions was the least common breast problem seen in this review and comprised 19.24%. This frequency is comparable to 18.5% in Saudi Arab<sup>4</sup> and 17.4% in Pakistan<sup>23</sup>, but much lower than the frequency of 41.8% documented in another report from Northern Saudi Arab<sup>5</sup> where breast abscess alone accounts 36.1%. Breast abscess was the third major category in this series accounting for 9.15% cases. Peak incidence of the patient were in the 3<sup>rd</sup> decade of life (58.6%) and 89.66% were less than 40 years of age, reflecting the association of this lesion with pregnancy and lactation. Amr et al<sup>10</sup> found 66.6% of the patients less than 36

years of age. It appears that the frequency for breast abscess is not reflective of the clinical incidence of the disease. This may be attributed to the fact that most breast abscesses are drained and only a minority is biopsied. Chronic mastitis comprised 3.47% cases, a figure consistent with the 1.2% and 4.2% documented in Saudi Arab<sup>10</sup> and Nigeria<sup>24</sup> respectively.

Granulomatous inflammatory changes in the breast can be related to specific infectious agents such as mycobacterium tuberculosis, foreign material such as silicon or suture material, trauma or systemic autoimmune disease. We had ten cases of granulomatous mastitis. Tuberculosis is a rare disease affecting the breast in 1.48% cases as observed by Malik et al<sup>23</sup> in their study. In the present series, it accounts 0.95% of all breast lesions. A much higher figure of 23% was however reported in the literature.<sup>25</sup>

Carcinoma of the breast is among the commonest human cancer worldwide. Studies from Bangladesh have consistently shown breast cancer to be the most frequent cancer of the women. Bari et al<sup>26</sup> and Talukder et al<sup>27</sup> found 29.65% and 23.3% breast cancers respectively. Carcinoma of the breast ranked second in this series. It constitutes 23.34%, which is similar to 24% reported by Hussain et al<sup>7</sup>, 24.2% by Chaudhary et al<sup>22</sup>, 23.4% by Shirley et al<sup>14</sup>, but lower than 39.1% and 41% reported by Nggada et al<sup>28</sup> and Siddiqui et al<sup>29</sup> respectively, who found carcinoma as the dominant lesion in their studies. Breast cancer usually presents with unilateral single hard lump as evident in the present study. Of the recorded 66 patients with cancer 36 were detected on the left side and 30 were on the

right side. None of the cases was bilateral. Left sided predominance was also found in other studies.<sup>4,10</sup> There is no clear cut reason for the preference of left breast to the right because other studies have shown breast cancer occurring more frequently in the right breast than the left.<sup>30</sup>

Age of the cancer patients is an important factor both for occurrence and management of the cases. In the present study the average age of the breast cancer case at presentation was found to be 47.2 years. The presentation is in consistent with the other developing countries.<sup>3,6,29,31</sup> This clinical data of women with breast cancer however different from that of the developed world. The most striking difference between the developing and the developed world is in terms of an early peak age at presentation, which is 40 to 50 years in the former compared to 60 to 70 years in the latter.<sup>32</sup> The average age is about one and half decade earlier than that of the patients in the developing countries like United States. The average age of occurrence of breast cancer amongst US white females is 61 years.<sup>1</sup>

There is a higher occurrence of breast cancer in younger age groups. In all, 63.5% were younger than 50 and 27% were younger than 40 years in age. A similar proportion of 60% patients being younger than 50 years<sup>33</sup> and 32% patients younger than 40 years<sup>34</sup> have been reported in other studies from developing countries. This is in sharp contrast in developed countries like USA where 7.4% patients are under 40 years of age.<sup>35</sup> The reason for early age of occurrence in the developing countries in Asia, Africa and Arabian regions needs to be further studied.



Ductal carcinoma in situ (DCIS) is a preinvasive variant of breast cancer, 85% is detected by mammography and the rest are detected as a lump. Only two patients (0.63%) among 74 cancer patients were registered as DCIS in the present study. This is in contrast to the western world where DCIS accounts for over 20% of the breast carcinoma.<sup>36</sup> The major reason of this discrepancy is the absence of population-based mammographic screening program in developing countries.

Histology as a prognostic factor has been well documented. Patients with histology of IDC have a poor survival compared to other types.<sup>1</sup> In the present study among the different histomorphological types, IDC was found to be the most common type (91.89%) and ranked second frequent diagnosis in breast lump in this series. This is consistent with many national<sup>12,17</sup> and international reports<sup>1,3,16</sup>. The frequency of IDC in our patients is comparable to 90.5% reported by Hussain et al<sup>7</sup> and 91.3% by Siddiqui et al<sup>29</sup>, but higher than that found in the developed countries. About 70% to 80% patients have IDC in the developed countries.<sup>1</sup>

Lesions of the male breast were seen in three cases and all were diagnosed as gynaecomastia. Carcinoma arising in the male breast is a rare occurrence. The overall incidence in men is less than 0.5%.<sup>36</sup> No cancer was found in men in present series. Significantly higher rates (6% to 10% of all breast cancer cases) have however been reported from some countries in Africa like Tanzania and Egypt.<sup>37,38</sup>

#### *Conclusion*

The profile of breast lesions in the present series follows a pattern similar to that of other

developing countries. The commonest breast lesion was fibroadenoma followed by invasive ductal carcinoma and breast abscess.

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