

Original Article

Cytological Evaluation of Palpable Non-Neoplastic Breast Lesions among Women attended from Rural Community of Bangladesh: A Cross-Sectional Study

Kazi Md. Shahidur Rahman¹, ASM Mahmud Hasan², Nazmun Nahar³, Mohammad Iqbal⁴, Md. Abdullah Yusuf⁵, Mashrufa Rahman⁶

¹Associate Professor, Department of Pathology, Monno Medical College & Hospital, Manikganj, Bangladesh; ²Professor & Head, Department of Pathology, Monno Medical College & Hospital, Manikganj, Bangladesh; ³Professor, Department of Pathology, Medical College for Women & Hospital, Dhaka, Bangladesh; ⁴Professor, Department of Anatomy, Monno Medical College, Manikganj, Bangladesh; ⁵Associate Professor, Department of Microbiology, National Institute of Neurosciences & Hospital, Dhaka, Bangladesh; ⁶Assistant Professor, Department of Pathology, Monno Medical College, Manikganj, Bangladesh

Abstract

Background: Non-neoplastic palpable breast disease is one of the most common disorders from which women suffer throughout the world. The use of fine-needle aspiration cytology (FNAC) method has proven to be quick, simple and cost-effective with minimum risk of complications in the evaluation of breast lumps. **Objective:** This study was planned to find out the common causes of various types of non-neoplastic breast lesions of female at different ages through fine needle aspiration cytology. **Methodology:** The cross-sectional study was carried out in the Department of Pathology at Monno Medical College & Hospital, Manikganj, Bangladesh. It lasted 2 years 6 months from July 1, 2019 to December 31, 2021. This study examined all breast lumps found in female patients. For data analysis, the patient's age and FNAC report were recorded. Aspirates were done using 5ml/10ml syringe and 23-gauge needle. Smears were stained with Papanicolaou stain. **Results:** The study included total 349 female patients with breast lesions. Among these, non-neoplastic lesions were 183(52.44%) cases and neoplastic lesions were 166(47.56%) cases. Among the lesions 349, 105(30.08%) cases were in fibrocystic changes; 28(8.02%) cases were in non-suppurative mastitis; 24(6.87%) cases were in suppurative mastitis (abscess), 14 (4.01%) cases were in granulomatous mastitis. About 45(42.88%) cases of Fibrocystic changes, 13(44.84%) cases of non-suppurative mastitis and 9(37.5%) cases of Suppurative mastitis (abscess) were in the age group 21 to 30 years, 21 to 30 years and 41 to 50 years respectively. **Conclusion:** Fibrocystic changes were the most common non neoplastic lesions, frequently affecting the left breast among women aged 21 to 30 years.

Key Words: FNAC; Non-neoplastic; breast lesion

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Correspondence: Dr. Kazi Md. Shahidur Rahman, Associate Professor, Department of Pathology, Monno Medical College, Monno City, Gilondo, Manikganj, Bangladesh; Email: kms.apr.2020@gmail.com; ORCID ID: 0009-0001-7911-9527, Mobile no.: +8801819322764

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Introduction:

Since ancient times, the breasts have been a subject of clinical interest to clinicians. Breast disease is the most common disorder suffered by women throughout the world. Women suffer about 30% of breast disease in their lifetime.¹ Fine needle aspiration cytology (FNAC) plays a significant

role in the management of palpable breast lesions in surgical outpatient department. Fine needle aspiration cytology (FNAC) plays an important role in management in this aspect.² Fine needle aspiration cytology is an excellent, safe, and cost-effective diagnostic procedure. One can get a report with minimal cost using inexpensive

equipment and a simple technique. The high degrees of accuracy, quick results, and less invasive process compared to a tissue biopsy are the main benefits of FNAC. The number of open biopsies can be decreased using FNAC.³⁻⁶ The clinical evaluation, mammography, and fine needle aspiration cytology triple diagnostic approach offers a precise diagnosis and lowers the chance of a missed breast cancer diagnosis to 1.0%.⁷ The aim of this present study was to find out the common causes of female breast lumps at different ages with special interest on non-neoplastic breast diseases.

Methodology

Study Setting and Population: The cross-sectional study was conducted in the Department of Pathology at Monno Medical College, Manikganj, Bangladesh. The time period of study was 2 years 6 months. It spanned from July 1, 2019 through December 31, 2021. FNAC of consecutive patients were done after taking informed consent. This study examined all breast lumps found in female patients. All female patients aged 11 to 70 years who presented with unilateral or bilateral breast lumps in any quadrant of the breast were included in this study. Patients with no palpable breast lumps were excluded from this study.

Study Procedure: The clinical history pertaining to the lesion was obtained. The swelling was then examined locally in accordance with proper aseptic measures. After physical examination of the patients, the specimen was collected with full aseptic precaution. The collected specimens were kept properly in the collection container.

Specimens Collection: To conduct fine needle aspiration (FNA), essential equipment such as disposable 5ml/10ml plastic syringes, 23-gauge needles, gauze pads, glass slides, alcohol, gloves, a Coplin jar for immediate wet fixation of smears, and a container for collecting fluid from cystic lesions were used. The technique was thoroughly explained to the patient prior to carefully examining the swelling. After sterilizing the skin with an antiseptic, the thumb and index finger of one hand were used to fix the skin in a position suitable for needle aspiration. A disposable syringe was positioned at the appropriate angle towards the affected areas, and upon pulling the plunger, a negative pressure was created within the syringe. To collect samples from different surrounding areas,

the needle was moved in various directions and up and down multiple times. After gradually releasing the plunger to restore the syringe's pressure, the needle was removed. Anesthesia was not necessary. FNAC was performed using both aspiration and non-aspiration techniques as needed. FNAC was completed. Without the use of ultrasound guidance, FNAC was performed on swelling that was easily accessible and palpable. After removing the needle from the syringe, a vacuum was formed, the needle was replaced, and the contents were gently and slowly released onto the glass slides that were dry, clean, and free of grease. The aspirates were then evenly spread using a second glass slide. To ensure fixation, two to four smears were wet fixed in 95% ethanol right away. All the slides were stained with Papanicolaou stain and examined under light microscope. A cytomorphological diagnosis was made based upon pathology.

Statistical Analysis: Statistical analysis was performed by Windows based software named as Statistical Package for Social Science (SPSS), versions 22.0 (IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.). Continuous data were expressed as mean, standard deviation, minimum and maximum. Categorical data were summarized in terms of frequency counts and percentages. Chi-square test was used for comparison of categorical variables and Student t test was applied for continuous variables. Every effort was made to obtain missing data. A two-sided P value of less than 0.05 was considered to indicate statistical significance.

Ethical Consideration: Participants in the study were informed about the procedure and purpose of the study and confidentiality of information provided. All participants consented willingly to be a part of the study during the data collection periods. All data were collected anonymously and were analyzed using the coding system. Written informed consent was obtained from each participant according to Good Clinical Practice guidelines.

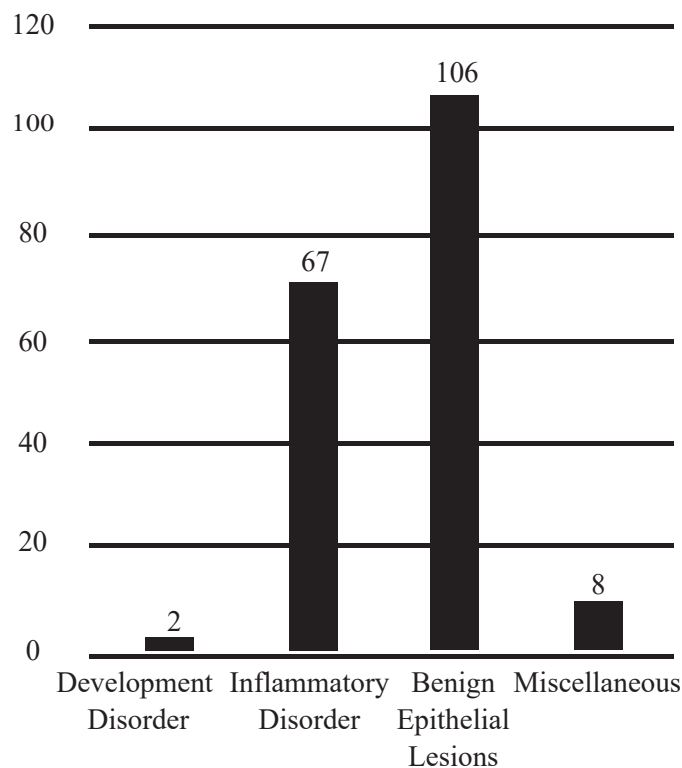
Results

Total FNAC of breast was done in 357 patients. Of which, 8 patients were male. These cases were excluded. Among remaining, 349 cases, non-neoplastic lesions were 183 and neoplastic lesions were 166 cases (Table 1).

Table 1: Pattern of Breast of Lumps

Type of Lesion	Frequency	Percent
Non-neoplastic	183	52.4
Neoplastic	166	47.6
Total	349	100.0

The most common non-neoplastic breast lesions were benign epithelial lesions which were 106 cases followed by inflammatory disorders and development disorders which were 67 cases and 2 cases respectively. Only 8 cases were found as miscellaneous group (Figure I).

**Figure I: Showing the Non-Neoplastic Breast Lesions (n=183)**

Among inflammatory disorders, Non-suppurative mastitis, Suppurative mastitis (abscess), and Granulomatous mastitis were found in 28(15.30%) cases, 24(13.11%) cases and 14(7.65%) cases respectively. Non-proliferative breast changes (fibrocystic changes) and proliferative breast disease without atypia

(epithelial hyperplasia) were found in 105(57.4%) cases and 1(0.5%) cases respectively. In miscellaneous group, galactocele and lipoma were found in 2(1.09%) cases and 6(3.27%) cases respectively (Table 2).

Table 2: Distribution of Different Variant of Non-Neoplastic Breast Lesions

Types of Non-Neoplastic Diseases	Frequency	Percent
Disorder of Development	2	1.09
• Accessory Axillary Breast Tissue	2	1.09
Inflammatory Disorder (Mastitis)	67	36.6
• Suppurative mastitis (abscess)	24	13.11
• Non-suppurative mastitis	28	15.30
• Granulomatous mastitis	14	7.65
• Duct ectasia	1	0.54
Benign Epithelial Lesions	106	57.9
• Non-proliferative breast changes (Fibrocystic changes)	105	57.4
• Proliferative breast disease without atypia (Epithelial Hyperplasia)	1	0.5
Miscellaneous	8	4.4
• Galactocele	2	1.09
• Lipoma	6	3.27

The age group of the study population were compared with the different non-neoplastic diseases. Fibrocystic changes were most common in the age group of 21 to 30 years which was 45(42.88%) cases followed by 31 to 40 years, 41 to 50 years and 51 to 60 years which were 28(26.66%) cases, 21(20.0%) cases and 5(4.76%) cases respectively. Again, suppurative mastitis was most common in the age group of 41 to 50 years which was 9(37.5%) cases. Non-suppurative mastitis was found mostly in the age group of 21 to 30 years which was 13(44.84%) cases. Granulomatous mastitis was found in 8(57.14%) cases mostly in the age group of 31 to 40 years (Table 3).

Table 3: Age Distribution of Non-Neoplastic Diseases

Age Group	Fibrocystic Changes	Suppurative Mastitis	Non-Suppurative Mastitis	Granulomatous Mastitis	P value
11 to 20 Years	4(3.8%)	(12.5%)	7(24.13%)	1(7.14%)	0.223
21 to 30 Years	45(42.88%)	(33.3%)	13(44.84%)	5(35.72%)	
31 to 40 Years	28(26.66%)	(12.5%)	5(17.24%)	8(57.14%)	
41 to 50 Years	21(20.0%)	(37.5%)	4(13.79%)	-	
51 to 60 Years	5(4.76%)	(4.2%)	-	-	
61 to 70 Years	2(1.9%)	-	-	-	
Total	105 (100%)	24 (100%)	29(100%)	14(100%)	

Among benign epithelial lesions non-proliferative breast changes (fibrocystic changes) was found in 55(52.4%) cases and 50(47.6%) cases in in left and right breast respectively. Among mastitis, suppurative (abscess) was found in 13(19.40%) cases and 11(16.41%) cases in left and right breast respectively. Non-suppurative mastitis was detected in 13(19.40%) cases and 15(22.40%) cases in left and right breast respectively. Granulomatous was found in 5(7.46%) cases and 9(13.43%) cases in left and right breast respectively. Galactocele and lipoma were found in 2 cases and 3 cases in left breast respectively (p=0.21) (Table 4).

28 cases (15.30%), granulomatous mastitis 14 cases (7.65%) and duct ectasia 1(0.54%) case. Benign Epithelial Lesions are predominant, totaling 106(57.9%) cases, with non-proliferative breast changes (Fibrocystic changes) at 105(57.4%) cases and proliferative breast disease without atypia (Epithelial Hyperplasia) at 1(0.5%) case. Miscellaneous findings encompass galactocele at 2 cases (1.09%) and lipoma at 6 cases (3.27%) (Table 2). These findings consistent with Priyanka et al.¹³ The frequency of benign epithelial lesions is nearly similar to studies done by Yusuf et al¹⁴ (54.5%) and Sharif et al¹⁵ (54%). Fibrocystic alterations are described as "lumpy bumpy"

Table 4: Distribution of Non-Neoplastic Breast Lesions in Right and Left Side

Name of Diseases	Left Breast	Right Breast	Total	P value
Developmental Ectopic Breast Tissue (n=2)	1 (50.0%)	1 (50.0%)	2(100.0%)	-
Benign Epithelial Lesions (n=106)				
• Non-Proliferative Breast Changes (Fibrocystic changes)	55(52.4%)	50(47.6%)	105(100.0%)	
• Proliferative Breast Disease Without Atypia (Epithelial Hyperplasia)	0(0.0%)	1(100.0%)	1(100.0%)	0.2967
Mastitis (n=67)				
• Suppurative (abscess)	13(19.40%)	11(16.41%)		
• Non Suppurative	13(19.40%)	15(22.40%)	67(100.0%)	0.51
• Granulomatous	5(7.46%)	9(13.43%)		
• Duct ectasia	1(1.50%)	0		
Miscellaneous (n=8)				
• Galactocele	2	0	8(100.0%)	0.21
• Lipoma	3	3		

Discussion

The various studies in Bangladesh have revealed a wide range of breast lesions. Lesions in the breast may be either non-neoplastic or neoplastic. However, fear of (neoplastic) malignancy is the main reason to compel the patient to report to the clinician. Thus, to relieve the stress of the patients, it is necessary to investigate these patients according to standard protocols.⁸ Fine Needle Aspiration Cytopathology (FNAC) is widely recognized as a reliable procedure for the initial evaluation of palpable breast masses. It is minimally invasive, cost-effective, safe, simple, rapid, and sensitive as compared to biopsy.^{9,10}

This study shows neoplastic lesions were 47.6% and 52.4% were nonneoplastic (Table I). Similar study Rioki et al¹¹ shows Neoplastic lesions were 84.5% and 15.5% were non-neoplastic. Though neoplastic findings were comparable to those of Chaudhary et al¹² (81.9% and 79.5%). This study shows disorder of development represents (1.09%), while Inflammatory Disorders (Mastitis) account for 36.6%, with suppurative mastitis constituting 24 cases (13.11%), non-suppurative mastitis

breasts on palpation by a physician, "dense breast with cysts" by a radiologist, and "benign histologic findings" by a pathologist. Because these lesions do not raise the chance of developing breast cancer, they are referred as non-proliferative lesions.¹⁶ Between the ages of 25 and 45, these lesions are most frequently found.¹⁷ The three main non-proliferative morphologic alterations are adenosis, fibrosis, and cystic change, frequently with apocrine metaplasia.¹⁶ In this study, the most common non-neoplastic lesion was fibrocystic disease (105/349) 30.08%, which is in accordance with the study of Khanam et al.¹⁸ Khanam et al¹⁸ also reported that 12(27.9%) had fibrocystic changes of the breast. Chaudhry et al¹⁹ observed patients with benign breast lesions, fibrocystic changes were more common (38/208)18.27%. Lakhana et al²⁰ also reported fibrocystic disease to be more common in their study. In other study, done by Kumar²¹ from Nepal, found fibrocystic disease (100/243) 41.2% while Ahtesham et al²² seen fibrocystic disease 17.2%. Bukhari et al²³ and Khanzada TW²⁴ also observed that fibrocystic disease was the most common non neoplastic lesion seen in about

21.17%) cases and 21.0% cases respectively, in Pakistan. But there are variations in the percentage of fibrocystic disease in different studies (ranging from 17.2% to 41.2%). We included 183 non-neoplastic lesions out of 349 in our study. The different age distribution of diseases was from 11-70 years of the patient. In the present study, the vast majority of the patients with fibrocystic disease were more common (42.9%) in the age group of 21–30 years, followed by 26.66% in the age group of 31–40 years. Rahman et al²⁵ established the highest percentage of similar age groups. In Rahman et al²⁵ study, the prevalence of fibrocystic disease was found to be 37.14% in the 21–30 age group and 30% in the 31 to 40 age group, respectively. In contrast, Sagar et al²⁶ have observed in their study that fibrocystic disease is common among people aged 41 to 60, which is a slightly higher age group than in this study. These differences might be attributed to geographical, socioeconomic and cultural variations. Females may feel unwilling to seek consultation for this type of lesion. On the other hand, fibrocystic disease was less common, (1.9%), between the ages of 61–70 years.

Fibrocystic change consists of a spectrum of morphological changes comprising soft to rubbery-firm, ill-defined nodules.²⁷ Smears from such lesions may contain numerous "cyst macrophages" with an abundant, finely vacuolated cytoplasm, sheets and clusters of ductal epithelial cells with abundant granular eosinophilic cytoplasm (apocrine type/change), apocrine metaplastic cells. Bimodal cell populations of ductular epithelium, and single bipolar bare nuclei and may be interpreted as fibrocystic change.^{27,28}

This present study has included patients from 11 to 70 years age group. In this study, the peak age group was found 41-50 years constituting 37.50% cases suppurative mastitis, 21 to 30 years constituting 44.84% cases non-suppurative mastitis and 31-40 years constituting 57.14% cases granulomatous mastitis.

Regarding the inflammatory conditions, the majority of cases consisting of non-suppurative mastitis is the most common (15.30%) followed by suppurative mastitis (abscess) (13.11%), granulomatous mastitis (7.65%), and duct ectasia (0.54%). Another study which has been conducted by Nemenqani and Yaqoob²⁹ found acute mastitis/abscess in 26.5% of the cases, whereas Sharif et al¹⁵ discovered acute pyogenic mastitis (12.0%) followed by tuberculous mastitis (9%).²⁹

Most of the non-neoplastic breast lesion i.e. fibrocystic

changes involved in the right and slightly more in left breast, there was no substantial difference in our study. Frequency of fibrocystic changes were in the right and left breast (47.62%), (52.38%) respectively. Khanam et al¹⁸ reported near to similar findings. Out of 50 cases, 29 cases (58%) in the right breast and 21 cases (42%) in the left breast were involved in their study.

Conclusion

From our study, we conclude that fibrocystic disease is the most common condition among non-neoplastic breast diseases, with a slight predominance in the left breast. Triple assessment by clinical, radiological and pathological examination is a standard approach in the evaluation of breast lumps. Along with clinical history and examination, FNAC can help to take decision for surgery or conservative treatment.

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