

Different Conditions of Breast Among Females Presenting with Breast Lump

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Abstract

Objective: To determine the radiological and clinical evaluation among women presenting with breast lump at a tertiary care Hospital.

Methodology: A descriptive cross-sectional study was done at surgery department at AIMS Hospital Muzaffarabad AJK from February 2023 to August 2023. All the women aged 18 years or old and presenting with palpable lump were included. A detailed medical history and clinical examination was done. Mammography and ultrasound were done to evaluate different conditions with breast lump. Furthermore, on suspicious lump by radiological evaluation, the FNAC or biopsy were done as per indications. Data was entered and analyzed using SPSS version 26.

Results: The average age of patients was 36.1 ± 11.78 years, with a disease duration ranging from 6 to 69 months. Most patients had a normal BMI (74.6%), while 23.8% were overweight and 1.6% obese. Fibroadenomas were the most common condition (33.3%), followed by breast abscess (14.3%), cysts and fibrocystic changes (each 12.7%), intra-ductal papilloma (11.1%), and lipoma (7.9%). Rare conditions like fibroadenoma with lipoma, mastitis, lipoma with intra-ductal papilloma, and fat necrosis each occurred in 1.6% of cases. No statistically significant associations were found between breast conditions and BMI, socioeconomic status, or lesion site ($p > 0.05$).

Conclusion: Study revealed the majority of the lesions were found on the right breast, and the most common condition identified was fibroadenoma, followed by breast abscesses, cysts, fibrocystic changes, intra-ductal papilloma, and lipomas.

Keywords: Breast lump, Lipoma, Abscess, Fibroadenoma

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Introduction

Breast diseases are significant burden of heterogeneous health conditions (either neoplastic or benign conditions) among women population around the world. A breast lump, a morbid condition with alarming mortality rates, is a cause of serious concerns among female population, possibly resulting from growing awareness on breast cancer.¹ Palpable lump in breast is frequently encountered breast condition within outpatient clinics, with 3% of complains among women in primary-care settings.² However, majority of lumps are benign, these breast masses or lumps, when

palpable, are more likely to develop into breast cancer, which calls for proper assessment of suspicious breast lumps.^{3,4}

In 2020, breast cancer was reported to affect 1 out of 8 diagnosed cases of cancers among males and females, with around 2.3 million fresh cases observed, and 1 female was diagnosed out of 4 females with all types of cancers.⁵ In the same year, 685000 deaths occurred among females due to breast cancer, which corresponds to death ratio of 16% or 1 out of 6 cancer-related death among women.⁶ A persistent trend in

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breast cancer development is estimated to result in 3 million fresh cases and around 1 million annual death rates by 2040, due to ageing and growing population alone.⁷

Breast lumps differ according to clinical presentation and age. Benign lumps conditions, such as fibroadenoma, lipoma, breast abscess, and cysts are most frequently encountered among younger women of age below 25 years. Cancerous lumps in breasts among women aged above 25 years is more common, suggesting that development of malignant lumps is directly proportional to the growing age.^{8,9} Fibroadenoma is a benign lesion in breast, typically palpable, solid, painless and mobile mass, with estimated incidence rates of 7-13%, and generally occurs during early reproductive age, with peak incidence reported at 20 to 30 years of age.¹⁰ Lipoma is another noncancerous lesion and a soft lump of fat cells, with reported incidence of 2.1 cases per 1000 women.¹¹ Breast abscess is characterized by pus accumulation and painful inflammation around breast, and often develops due to mastitis infections. Incidence of breast abscess ranges from 0.4-11% among lactating mothers.¹² Although these lumps are benign in nature, the possibility of cancer development cannot be neglected

The diagnosis of breast lumps encompasses various techniques including tissue sampling and clinic-radiological evaluation. Clinical assessment involves detailed physical examination, medical history taking, and risk factors assessment. Tissue sampling is a benchmark diagnostic procedure in breast cancer diagnosis. Advancement in biopsy devices and breast imaging led to percutaneous biopsy instead of surgical biopsy, with less complication in acquiring tissue samples. Fine-needle aspiration cytology (FNAC) is one of the most frequently applied techniques for obtaining percutaneous tissue samples include and involves removal of breast lump cells through fine needle.¹³

Radiological advancements, with improved accuracy and specificity, play major role in breast lump's diagnosis and management. The contemporary diagnostic approaches in breast malignancy include magnetic resonance imaging (MRI), mammography, and ultrasonography (US). Among these, ultrasonography is more frequently utilized due to its ability to detect changes in dense breast tissue among younger women in particular.¹⁴ Mammography, on the

other hand, is a gold standard in early detection of a lump in breast. However, in detecting the dense breast tissues among women it holds a relatively low sensitivity than ultrasonography, due to overlapping of other tissues in some lesions.¹⁵ MRI, though costly and time-consuming, is a widely accepted imaging modality in malignancy detection, due to its exceptional contrasting ability in soft tissue, enabling visualization of a tumor's internal architecture, but has some limitation including claustrophobia and presence of metallic implants.¹⁶

Breast lumps in women present a frequent clinical challenge, as they may arise from benign or malignant conditions with overlapping features. Accurate clinical diagnosis is essential to distinguish between these conditions early and to avoid unnecessary procedures or missed malignancies. This study is significant in identifying the clinical patterns and diagnostic criteria associated with different breast lump conditions, thereby improving diagnostic accuracy, guiding appropriate investigations, and ensuring timely management in clinical practice. Because of limited diagnostic resources and the awareness, specifically in developing countries, accurate diagnosis is often delayed. Present study aims to identify and differentiate various conditions presenting as breast lumps to improve early detection, diagnosis, and management. Study findings may enhance clinical decision making, public awareness, guide health policies, and support future research on breast health.

Methodology

This was a descriptive cross-sectional conducted at department of Surgery of AIMS Hospital Muzaffarabad AJK among women presenting with breast lumps. Study was done from February 2023 to August 2023, IRB Reg no SGR-2020-107-12140. All the women aged 18 years or older presenting with a palpable breast lump, were included in the study. A non-probability consecutive sampling technique was used. Women who had previously been diagnosed with or were undergoing treatment for malignant breast tumors, those with a history of prior breast surgeries, pregnant and lactating women, individuals with known systemic illnesses affecting breast tissue (such as tuberculosis or autoimmune diseases), and those unwilling to participate were excluded from the study. Study was done following the ethical approval from the Institutional Review Board and an informed consent was obtained from each participant. A detailed medical history and

clinical examination was done. Mammography and ultrasound were done to evaluate different conditions with breast lump. Furthermore on the on suspicious lump by radiological evaluation, the FNAC or biopsy were done as per indications. Data was entered and analyzed using SPSS version 26. Frequencies and percentages were calculated for categorical variables, while means and standard deviations were used for continuous variables. The Chi-square test was applied with a p-value of less than 0.05 considered statistically significant.

Results

Overall 63 patients with breast lumps were studied and most were married (66.7%) with an average age of 36 years. A majority had a normal BMI (74.6%), while fewer were overweight or obese. Educational levels varied, with primary education most common (31.7%), followed by illiterate (23.8%), higher secondary (23.8%), and graduates (20.6%). Most were housewives (65.1%) and belonged to the middle socioeconomic class (79.4%). Slightly more patients were from rural areas (52.4%) than urban (47.6%). Drug history was present in 17.5%, and family history in 15.9%. The left breast was most commonly affected (46%), followed by the right (38.1%) and both sides (15.9%). (Table I)

The most common condition was Fibroadenomas (33.3%), followed by breast abscess (14.3%), cysts and fibrocystic changes (each 12.7%), and intra-ductal papilloma (11.1%). Less common conditions included lipoma (7.9%), mastitis (3.2%), and a few cases with combined or rare findings such as Fibroadenomas with lipoma, lipoma with intra-ductal papilloma, and fat necrosis (each 1.6%). (Table II)

The most frequent condition, fibroadenoma, was primarily seen in patients with normal BMI (28.6%) and among those from the middle socioeconomic class (28.6%). Other common conditions like cysts and fibrocystic changes also appeared more often in patients with normal BMI. Breast abscesses and intra-ductal papilloma were slightly more frequent in overweight individuals and were mostly found in the middle SES group. Overall, no statistically significant association was observed between breast conditions and either BMI ($p = 0.312$) or socioeconomic status ($p = 0.608$). (Table III)

Table I: Demographic characteristics of the patients with breast lump. (n=63)

Variables	N	%
Marital status		
Married	42	66.7
Unmarried	21	33.3
BMI		
18.5 to 24.9 kg/m ²	47	74.6
25 to 28 kg/m ²	15	23.8
>28 kg/m ²	1	1.6
Educational status		
Illiterate	15	23.8
Primary	20	31.7
Higher secondary	15	23.8
Graduate	13	20.6
Occupational status		
Retired	1	1.6
Govt. employee	12	19.0
Private job	9	14.3
House wife	41	65.1
Residence		
Rural	33	52.4
Urban	30	47.6
Socioeconomic status		
Poor	9	14.3
Middle	50	79.4
Upper	4	6.3
Drug history		
Yes	11	17.5
No	52	82.5
Family history		
Positive	10	15.9
Negative	53	84.1
Site of lesion		
Right	24	28.1
Left	29	46.0
Bilateral	10	15.9
Age (mean± SD)	36.07±11.78 years	

Table II: Different conditions of breast with lump. (n=63)

Different breast conditions	N	%
cysts	8	12.7
Fibroadenomas	21	33.3
Fibroadenomas + Lipoma	1	1.6
Fibrocystic changes	8	12.7
Mastitis	2	3.2
Lipoma	5	7.9
Lipoma and Intra-ductal papilloma	1	1.6
Breast abscess	9	14.3
Intra-ductal papilloma	7	11.1
Fat necrosis	1	1.6
Total	63	100.0

Table III: Different conditions of breast with lump according to BMI and SES. (n=63)

Different breast conditions	BMI			p-value	SES			
	Normal	Overweight	Obese		Poor	Middle	Upper	
Cysts	7 11.1%	1 1.6%	0 0.0%	0.312	3 4.8%	3 4.8%	2 3.2%	0.608
Fibroadenomas	18 28.6%	3 4.8%	0 0.0%		2 3.2%	18 28.6%	1 1.6%	
Fibroadenomas + Lipoma	0 0.0%	1 1.6%	0 0.0%		0 0.0%	1 1.6%	0 0.0%	
fibrocystic changes	5 7.9%	3 4.8%	0 0.0%		1 1.6%	6 9.5%	1 1.6%	
Mastitis	1 1.6%	1 1.6%	0 0.0%		0 0.0%	2 3.2%	0 0.0%	
Lipoma	5 7.9%	0 0.0%	0 0.0%		1 1.6%	4 6.3%	0 0.0%	
Lipoma and Intra-ductal papilloma	0 0.0%	1 1.6%	0 0.0%		0 0.0%	1 1.6%	0 0.0%	
Breast abscess	6 9.5%	3 4.8%	0 0.0%		0 0.0%	9 14.3%	0 0.0%	
Intra-ductal papilloma	4 6.3%	2 3.2%	1 1.6%		2 3.2%	5 7.9%	0 0.0%	
fat necrosis	1 1.6%	0 0.0%	0 0.0%		0 0.0%	1 1.6%	0 0.0%	
Total	47 74.6%	15 23.8%	1 1.6%		9 14.3%	50 79.4%	4 6.3%	

Discussion

Breast cancers, among women, play significant role in cancer-associated deaths. Although, a breast lump can potentially indicate malignant breast carcinoma, it is noteworthy that some breast lumps can be non-cancerous, such as fibroadenoma and cysts. Benign lesions often miss the locus of focus, simply because they are not cancerous, neglecting the fact that certain asymptomatic lumps can potentially develop into cancerous lesions in future. This highlights the need for timely screening regular monitoring of breast lumps to identify the patients who are at high risk of cancerous lump.¹⁷ In the present study, 63 female patients with breast lumps were evaluated most were married, housewives, from middle socioeconomic backgrounds, had normal BMI, and an average age of 36 years. A small proportion reported a drug history (17.5%) or family history (15.9%) of breast conditions. Similar demographic trends were observed in a study by Olaogun et al¹⁸ where most patients were married (78%) and had a comparable family history profile, though their mean age was higher (48.9 years), and a greater proportion had tertiary education (43.9%), contrasting with the lower educational levels in our cohort. Likewise, Haas et al¹⁹ reported consistent findings in terms of marital status (56% married/living with partners), family history (17.2%), and BMI (60.8% with normal weight), but a higher proportion of

graduates (33.6%) in contrast to our study, where primary education was most common. Additionally, in this study, left breast was most commonly affected (46%) site of lesion, followed by the right (38.1%) and both sides (15.9%), which was similar to the study by Abdou et al.,²⁰ where tumors were more frequently seen on Left side and Shrestha et al.²¹ where they also reported the lumps on left side (54.3%) occurred more commonly. The some differences in the findings across the studies may be attributed to multiple factors, including geographical variation, differences in health infrastructure, literacy rates, cultural attitudes toward women's education, and accessibility of healthcare facilities.

Present study showed the fibroadenoma as most common breast lesion (33.3%), followed by breast abscess (14.3%), cysts and fibrocystic changes (each 12.7%), and intraductal papilloma (11.1%). Less frequent conditions included lipoma (7.9%), mastitis (3.2%), and rare combinations such as fibroadenoma with lipoma, lipoma with intraductal papilloma, and fat necrosis (each 1.6%). These findings are largely consistent with the study by Njeze et al²² who also reported fibroadenoma as the most frequent lesion (39%), though slightly higher than in our cohort. Njeze's study additionally reported mammary dysplasia (32%) and carcinoma (17%) as common findings, suggesting a broader spectrum possibly due to larger sample size or different population characteristics.²² Similar trends

were noted in other studies, including Amrr et al²³ in Saudi Arabia (30.7%), Oluwole²⁴ in Nigeria (30%), and Ellis in England (37%),²⁵ all identifying fibroadenoma as the most prevalent benign breast lesion. The consistency across diverse geographic regions underscores the global predominance of fibroadenoma among benign breast conditions. Slight variations in the frequency of other lesions may be because of differences in sample size, sample selection criteria of the studies and diagnostic capabilities across study settings.

In our study, the most common condition was Fibroadenomas (33.3%), followed by breast abscess (14.3%), cysts and fibrocystic changes (each 12.7%), and intra-ductal papilloma (11.1%). Less common conditions included lipoma (7.9%), mastitis (3.2%), and a few cases with combined or rare findings such as Fibroadenomas with lipoma, lipoma with intra-ductal papilloma, and fat necrosis (each 1.6%). Consistent results were reported in the study of Njeze,²² wherein Fibroadenoma (39%) was the most frequent breast lesion, which was a little higher than the prevalence in our study. They further noted several other forms of breast lumps in their study, as mammary dysplasia (32%) was the second most frequent lesion, followed by Carcinoma (17%), Cyst (6%), Mastitis (1.8%), Adenoma (1.8%), Phyllodes (0.6%), Tuberculosis (0.6%), Galactocoele (0.6%), and Lipoma (0.6%). Several other studies also reported fibroadenoma as the most frequently observed breast lesion, as by Amrr et al.,²³ (30.7%) in Saudi Arabian region, by Oluwole²⁴ (30%) in Nigerian region, and by Ellis (37%)²⁵ in England.

In our study, fibroadenoma was most common in patients with normal BMI, differing from Bhattani et al findings, which showed a significant association with high BMI. Additionally, fibroadenoma was most frequent in patients from the middle socioeconomic class, similar to Jaiswal et al²⁸ but contrasting with Hussian et al²⁹ who found it more common in lower socioeconomic groups. Overall in this study, there was no statistically significant association between breast conditions and either BMI or SES ($p > 0.05$). Contradictory findings were reported by O'Brien et al³⁰ and Quiroga-Morales et al³¹ who also found no association between body composition and benign breast lesions. Furthermore, La Vecchia et al³² reported differing results, with a positive association between higher socioeconomic status and benign breast disease, and an inverse relationship with higher BMI. This difference may be due to the limited sample size

of this study and the classification of socioeconomic status based previous studies according to monthly income, which appears low due to the decreased value of the local currency. Though the future studies recommended including larger, multi-center populations to enhance the validity of the findings. Additionally longitudinal research designs are recommended to explore causal relationships between risk factors and breast lesions.

Conclusion

Findings of the study highlighted that the Fibroadenoma emerged as the most common benign breast condition, followed by breast abscess, cysts, and fibrocystic changes. The majority of females presented with breast lumps were of reproductive age and from lower socioeconomic backgrounds, with lesions more frequently located in the right breast. Immediate clinical evaluation and appropriate diagnostic workup remain essential for accurate identification and management of breast lumps to reduce anxiety and prevent unnecessary interventions.

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