CLINICOPATHOLOGICAL EVALUATION OF BREAST LUMP IN DIFFERENT AGE GROUPS

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Abstract:

Background: *Breast masses have a variety of etiologies, benign and malignant. Fibroadenoma is the most common benign breast mass; invasive ductal carcinoma is the most common malignancy. Most masses are benign, but breast cancer is the most common cancer and the leading cause of cancer deaths in women. Although most breast cancers occur in women older than 50, a significant number of women are diagnosed with breast cancer younger than 50. An efficient and accurate evaluation can maximize cancer detection and minimize unnecessary testing and procedures.*

Objectives: *Our study aimed to explore the frequency & pattern of different types of breast lumps in various age groups.*

Materials & method: *This cross-sectional observational study was carried out in the inpatient and outpatient department of surgery at Shaheed Ziaur Rahman Medical College Hospital, Bogra, from July 2008 to Dec 2008. A total of 130 patients with palpable breast lumps were included in the study. The age of the patients was between 11 to 70 years. Fine Needle Aspiration Cytology and biopsy were done for most of the patients with a breast lump. Sometimes ultrasonography, mammography, and other routine investigations were also done.*

Result: *In this study, the most common age was 11 to 20. The three most common diseases presented with lumps were Fibroadenoma, Carcinoma of the breast, and fibroadenosis. Peak age incidence of fibroadenoma was observed in the 11 to 20 age group (66%), while fibroadenosis was common in the third decade (46%), and peak age incidence was between the late twenties and early thirties. Carcinoma of the breast was common in 31 to 40 years age group (40%). No carcinoma was found below the age of 22 years. Most of the patients with carcinoma presented in an advanced stage. This reflects on illiteracy, poverty, lack of awareness, and medical facilities screening procedure in our population.*

Conclusion: *The diversity of clinical presentation of breast lumps in different age groups was observed in our hospital practice, and a correlation between clinical manifestations, FNAC findings, and histological diagnosis of breast lumps was made. Fibroadenoma was common in the second and third decades, while breast carcinoma was common in third and fourth decades. Here we attempted to find out the age incidence of the breast lump and its correlation with clinical features, FNAC findings, and histopathological reports to improve the accuracy of diagnosis and management of breast disease.*

Key words: *Breast lump, FNAC, Histopathology, Age incidence.*

Introduction:

The glandular structure of the breast can undergo changes from puberty to pregnancy and menopause due to hormonal effects. The discovery of breast lesions in females often causes great worry due to the high incidence of cancer in the adult group. The most common breast problems for which women consult a physician are breast pain, nipple discharge, and a palpable mass. The frequency of breast cancer

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varies with the age of the patient and the presenting complaint. Regardless of the type of breast problem, the goal of the evaluation is to rule out cancer and address the patient's symptoms. The extent of the assessment required to accomplish this goal varies with the type of clinical problem and the patient's age and risk status[1]. Age is an important predictor of breast cancer. Saadat et al. (2020) reported that the mean age at cancer diagnosis was 43.6 years and the youngest age at diagnosis was 20 years, with the majority occurring in the 36–45 age group. The second most common lesion was fibroadenoma, which constituted 22.4% of cases, with a mean age of 23.4 years and 15 years as the youngest diagnosis.[1] Although malignancy is rare in the early age group of patients, suspected lesions must be biopsied. Imaging is essential in the selection of patients for radiological intervention.[3] Knowledge of the differential diagnosis of breast lesions based on age in a female can help to direct appropriate management.

Breast masses have a variety of etiologies, benign and malignant. Palpable breast masses are common and usually benign, but efficient evaluation and prompt diagnosis are necessary to rule out malignancy. A thorough clinical breast examination, imaging, and tissue sampling are needed for a definitive diagnosis.[4] Benign lesions of the breast are common in younger age groups, while malignant lesions are common in older age groups.[5] The types of breast lesions in young females vary markedly from that in adults, with the former lesions being overwhelmingly benign. After puberty, most cases of breast masses are benign fibroadenoma. Malignant masses of the breast in young females are rare. Other causes include infection, trauma, and cyst formation. In young females, interventions may lead to a disfigurement of the breast.[3]

Benign breast diseases (BBD) constitute a heterogeneous group of lesions, including developmental abnormalities, inflammatory lesions, epithelial and stromal proliferation, and neoplasms.[6] A previous cohort study of 61 617 women in Sweden, incidence rates for distinct BBD subtypes in individuals 25 to 69 years of age were estimated. The study found that the risk of the most common BBDs by hormonal factors was influenced by age and that a family history of breast cancer was associated with the risk of proliferative and nonproliferative BBDs.[7]

Breast cancer (BC) is the most common cancer in women and the second most common in both genders after lung cancer. In 2018, there were 2 088 849 (11.6% of all cancers) new cases of BC, and this resulted in 626 679 (6.6% of all cancers) deaths worldwide8. Despite the fact that most breast lesions are benign, benign proliferative breast lesions with atypia have a higher risk for cancer than those without atypia[9]. Common risk factors are reproductive factors, alcohol intake, high breast density, postmenopausal hormone replacement therapy, and, most importantly, family history of BC. A family history of other cancers, such as colon, ovary, and prostate, is also a known risk factor for BC.[3, 7]

A previous study[5] categorized breast lesions according to their association with age distribution. Result demonstrated that among the study population, 53.85% had benign lesions, Breast carcinoma accounted for 46.15% of cases, fibroadenoma for 40.76%, and fibroadenosis were in 10% of cases. Fibroadenoma was common in the second and third decades, while carcinoma of the breast was common in the third and fourth decades. Another study noted that fibroadenoma, EP, and fibrocystic changes (FCCs) were relatively common at younger ages (45, 32, and 42 per 100 000 person-years at the age of 25 years), increased during the 30s and 40s (81, 55, and 140 per 100 000 person-years at the age of 40 years), and decreased thereafter (24, 18, and 65 per 100 000 person-years at the age of 55 years).

Epithelial proliferation with atypia was slightly less common at younger ages, with a maximum at the age of 45 years, and the incidence rates for cysts increased rapidly after 40 years of age, with a maximum at the age of 50 years.[7]

There is a significant variation in the presentation of different breast lesions

concerning the age of the patients. Fine needle aspiration cytology (FNAC), ultrasonography, mammography, and excision biopsy are essential investigations for diagnosing breast lumps to discover the incidence of breast carcinoma, fibroadenoma, or other pathology in different age groups [1, 4]. Here we attempted to find out the age incidence of the breast lump and its correlation with clinical features, FNAC findings, and histopathological reports to improve the accuracy of diagnosis and management of breast disease.

Methodology:

This prospective observational study was carried out in surgical units and the outpatient department of Shaheed Ziaur Rahman Medical College Hospital (SZRMCH), Bogra, from patients attended with breast lumps. All patients, irrespective of age and who had definite palpable breast lumps & patients or their guardians who agreed to comply, were included in this study. Patients with breast abscesses were excluded from the study. Informed written consent was taken from the patient. The detailed history of each patient was recorded with particular attention to their age, parity, nursing history, menstrual history, menopausal status, history of breast lump, trauma, use of oral contraceptives, and history of breast cancer in their family. Important and relevant findings on thorough physical examination were recorded, and in all cases, relevant investigations were done. FNAC or excision biopsy was done in all cases, and ultrasonography in some cases. Other routine examinations were done, and necessary advice was given for follow-up in cases where applicable. Results and observations were tabulated and studied about age. The patient information was recorded and included in the data collection sheet. The demographic indices, for example, age, sex, and residence, along with clinical data, including the associated symptoms, vital signs, and general and systemic examination, were recorded. The data were collected, and statistical analysis was performed using SPSS software version 23. The results were represented as categorical data, and the chi-square test was used. We reported statistically significant P values ($P \leq 0.05$) and their 95% confidence intervals.

Result & Observation:

According to the questionnaire, history of all the 130 selected cases were taken, the clinical examination was carried out meticulously. Result & observations are given below,

Table-I
Demographic characteristics of Study population (n=130)

Demographic features	Frequency	Percentage
Age (Years)		
0-10	0	0
11-20	36	27.7
21-30	28	21.5
31-40	35	26.9
41-50	21	16.2
51-60	8	6.15
61-70	2	1.53
71-80	0	0
Residence		
Urban	97	74.6
Rural	33	25.4
Economic class		
Poor	38	29.2
Middle	75	57.6
High	17	13.0

Table I shows the demographic characteristics of the patients. The age of the patients ranged from 11 to 70 years. Most patients were in 2nd decade followed by 4th decade. Maximum numbers of respondents (74.6%) came from urban area and socioeconomically middle class (57.6%) comprising the major percentage of the patients.
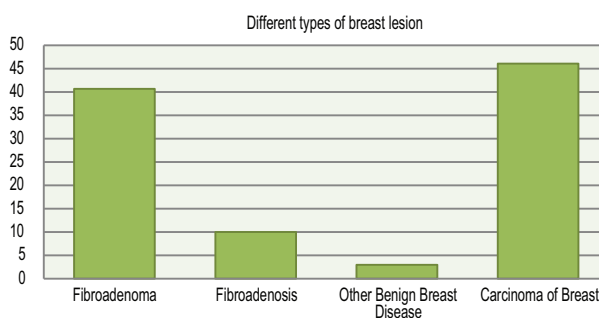

Fig.-1: *Incidence of breast lesion among the study population (n=96)*

Among the study population 53.85% had benign lesions & breast carcinoma accounted for 46.15% cases. Among the benign lesion, fibroadenoma for 40.76%, fibroadenosis were in 10% cases, other benign lesion were 3.0% cases (Figure 1).

Table- II

Relationship between age distribution & pathological findings of breast lump (n=130)

Age range (years)	Total no. of Patient (n=130)	Fibroadenoma (n=53)	Fibroadenosis (n=13)	Other Benign lesion (n=4)	Carcinoma of Breast (n=60)
11-20	36	35	-	1	-
21-30	28	14	-	2	12
31-40	35	4	7	-	24
41-50	21	-	3	1	17
51-60	8	-	3	-	5
61-70	2	-	-	-	2

Distribution of 130 patients according to their age in table-II. Age incidence varied from 15 to 70 years. When considering all lessons, maximum incidence was in the 2nd decade (36 cases, 28%), followed 4th decade (35 cases, 27%). Fibroadenoma was common in 2nd, 3rd and 4th decade. Carcinoma of Breast was the most common in 4th decade (24 cases, 40%) in this study.

Table- III

Family history of breast lump

Types of lesions	Cases (n)	Percentage
All lesions	11 of 130	9%
Fibroadenoma	5 of 53	10%
Fibroadenosis	1 of 13	8%
Breast carcinoma	5 of 60	8%

Table-III shows a positive history of breast disease in family was only in 9% of cases. Positive family history of fibroadenoma and fibroadenosis were 10% and 8% respectively. Breast carcinoma was 8%.

Table-IV

Age distribution of patients diagnosed as carcinoma (n=60)

Age groups in years	No of patients	Percentage
0-10	0	0%
11-20	0	0%
21-30	12	20%
31-40	24	40%
41-50	17	28%
51-60	5	8%
61-70	2	3%
71-80	0	0%

Table-IV shows that 40% of patients presents with carcinoma at age group 31-40. 28%of patients presents with carcinoma at age group 41-50, and 20% patient presents at age group 21-30. Only 11% of patients presenting with carcinoma are above 50 years.

Table-V

Correlation of clinical diagnosis, FNAC findings and histopathology (n=130)

Clinical diagnosis	Case No	FNAC	Case No	Histopathology	Case No
Fibroadenoma	49	Fibroadenoma	40	Fibroadenoma	36
		Fibroadenosis	5	Fibroadenosis	6
		Carcinoma	4	Carcinoma	7
Fibroadenosis	20	Fibroadenosis	10	Fibroadenosis	4
		Fibroadenoma	6	Fibroadenoma	7
		Carcinoma	4	Carcinoma	9
Breast carcinoma	42	Carcinoma	37	Carcinoma	38
		Fibroadenoma	3	Fibroadenoma	3
		Fibroadenosis	2	Fibroadenosis	1
No confirm diagnosis	19	Fibroadenosis	4	Fibroadenosis	2
		Fibroadenoma	5	Fibroadenoma	7
		Chronic inflammation	5	Chronic inflammation	2
		Phyllodes	2	Phyllodes	1
		Lipoma	2	Lipoma	1
		Carcinoma	1	Carcinoma	6

Table-V shows that 49 (38%) cases were clinically diagnosed as fibroadenoma but according to FNAC it was 40 (31%) and according to histopathology it was 36 (28%). Total 20 (16%) cases were clinically diagnosed as fibroadenosis but according to FNAC it was 10 (7.69%) and according to histopathology it was 4 (3.08%) and 42 (32%) cases were clinically diagnosed as breast carcinoma but according to FNAC it was 37 (28.46%) and according to histopathology it was 38 (29.2%).
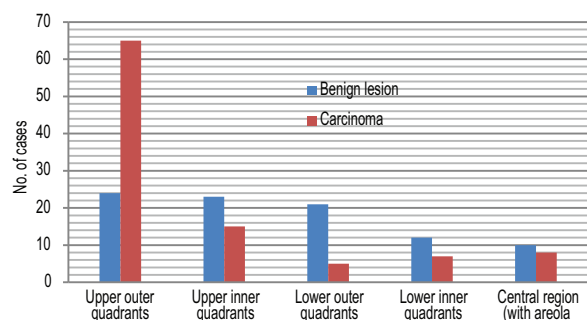

Fig.-2: *Distribution of breast lumps in different quadrants (n=130)*

Most lesions were found in the upper and outer quadrant of the breast (48% of all lesions). Of all lesions (68% occurred in the two lateral (outer) quadrants. Fibroadenoma and Breast carcinomas were also common in upper and outer quadrant of the breast (Figure 2).
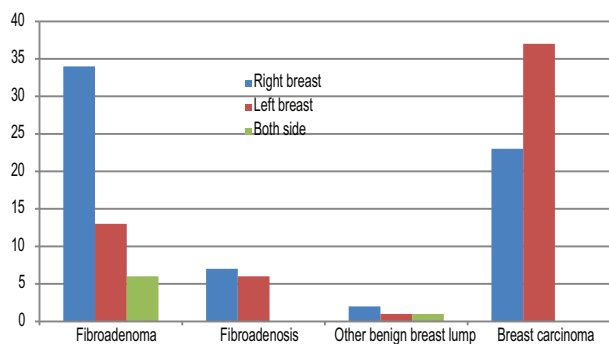

Fig.-3: *Distribution of breast lumps according to the side (n=130)*

Distribution of breast lumps according to the side (right or left) of the breast involved is shown in figure 3, considering all lesions, right breast (34) involved in most of the cases in comparison to left breast.[13] Only 11% cases involved the both breast. Fibroadenoma was more (64%) in the right breast and breast carcinoma in the left breast (62%). Other benign diseases of the breasts are common in the right breast.

Discussion:

The present study was conducted among 130 patients. Patients presenting with palpable breast lumps were included. Among the 130 patients, 70 (53.84%) breast lesions were benign. Rest 60 lesions (46.15%) were malignant. Breast carcinoma was the most common lesion accounting for 46.15% (60 lesions) of all; Fibroadenoma was 40.76% (53 lesions) of all lesions. The third most common lesion was fibroadenosis comprising 10% (13 lesions) and other benign breast disease was found in 7 (3.08%) patients.

The relative incidence of these three lesions varies in different studies. Whole and Freeman[10] analyzed 255 breast lesions in 282 patients and found Fibroadenoma was the most common (34.75%) lesion. Second and third most common lesions were carcinoma and fibrocystic disease comprising 28 and 17 percent, respectively. However, this study's percentage of fibrocystic disease was low (10% cases). It is difficult to conclude because most patients with fibrocystic disease usually do not come to the hospital before a definite lump in the breast appears.

In this study of 130 cases of breast lumps, the most typical age group was 11 to 20 years. The youngest patient was of 12 years of age, and the oldest was 70. Oluwole and freeman[10], in their series of 202 cases of breast disease, found that the presenting age varied between 13 and 70 years, and peak age incidence was 25 to 35 years.

In this study, Fibroadenoma was found common in the second and third decades, comprising 66%, and 26%, respectively. The peak age incidence in this study was between 10 to 20 years age group. Oluwle and freemen[10] have observed that peak age incidence was between 16 to 25 years for Fibroadenoma, which is consistent with this study. But we have not observed a biphasic curve with peaks at 25 and 48 years, as reported by Nigro and Organ.[11] All

study shows that Fibroadenoma occurs at an earlier age. The present study findings correlate with the above studies.

In this study, carcinoma of the breast was common in the 30 to 50 age group (68%). No carcinoma patient was found below the age of 20 years. There was a sharp rise in the number of carcinoma up to 50 years of age. Saadat et al. (2020) reported that the mean age at cancer diagnosis was 43.6 years and the youngest age at diagnosis was 20 years, with the majority occurring in the 36–45 age group. The second most common lesion was Fibroadenoma, which constituted 22.4% of cases, with a mean age of 23.4 years and 15 years as the youngest diagnosis.[2] Another study noted that Fibroadenoma, EP, and fibrocystic changes (FCCs) were relatively common at younger ages. Epithelial proliferation with atypia was slightly less common at younger ages, with a maximum at the age of 45 years, and the incidence rates for cysts increased rapidly after 40 years of age, with a maximum at the age of 50 years.[7]

Of 130 cases, 38% of patients were clinically diagnosed as Fibroadenoma; according to FNAC, 31% and by histopathology, 28% of cases were diagnosed with Fibroadenoma. Rests of them were diagnosed as fibroadenosis and duct cell carcinoma. 15% of total cases were diagnosed as fibroadenosis; only 7.69% were fibroadenosis by FNAC and 3.08% by histopathologically. Rests of them were Fibroadenoma and duct cell carcinoma. Of 130 cases, 32% were clinically diagnosed as carcinoma, 28.46% of these diagnosed cases correlated with FNAC, and 29.23% correlated with histopathology reports.

Similar observations were reported by two other surgical publications. Wilkinson and forrest[12] conducted a study on Fibroadenoma only. They found that only 134 of the 505 cases of clinically diagnosed Fibroadenoma were proved to be true Fibroadenoma recognized on histological examination. 44 (32.8% 0 out of the rest 66 cases were fibrocystic disease and 8 were carcinoma. They also found 13 cases of Fibroadenoma histologically but not diagnosed clinically as Fibroadenoma and showed that only 46% of their clinical diagnoses were correct.

As the breast's main problem is its risk of being malignant, early detection of underlying pathology is suitable for extended survival. The probability of developing breast cancer increases with age. As the cost-benefit ratio of screening programs to society is unclear, less expensive screening techniques should be implemented, and the vulnerable age group should be followed carefully. This will help to improve the survival rate. Women of 30 to 50 years of age should have an annual breast examination as a part of routine medical care; a baseline mammogram should be done in women of 30 to 50 years. Self-examination of the breast is also critical in the early detection of the breast lump. Therefore annual mammography is recommended. Patients with suspicious masses must undergo a biopsy (FNAC) despite mammographic findings.

Conclusions:

These results suggest that the risk of breast lesions varies by age. The most common lump-producing lesions in the breast are Fibroadenoma, fibroadenosis, and carcinoma. Fibroadenoma occurs mainly in 11 to 20 years old, whereas fibroadenosis is found primarily in the late twenties and early thirties, and carcinoma is in the 30 to 50 age group. The probability of developing breast cancer increases with age throughout life. Women at greater than average risk of developing breast cancer should be identified by proper health education and screening program through regular self-examination of the breast, physical examination by doctors, and mammography. Early breast lump detection, differentiation between benign and malignant lesions, and proper treatment has immense value.

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