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An Observational Study of Breast Lump in Premenopausal and Postmenopausal Women

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Abstract: ***Background: A breast lump is "Any discrete mass noticed by the patient, significant other, or physician". The present study was undertaken to determine and compare breast lumps in premenopausal and postmenopausal women. Method: Total 100 female patients of age >18 years who had complaints of a lump in the breast were enrolled in the study and divided into two equal groups based on their menstrual status i. e., premenopausal, and postmenopausal group. Physical, clinical and ultrasound examination and in selected patients' mammogram of the breast was done. Fine needle aspiration cytology (FNAC) or core needle biopsy was done. For all operated cases, post - operative tissue specimen was sent for histopathological examination. Results: Maximum patients were diagnosed between 41 to 60 years old (56%), with only lump (66%), in right breast (51%), in the central and upper quadrant with a history of 2 - 6 months duration. In pre - menopausal women, the maximum cases (84%) had benign breast disease while in post - menopausal women the maximum cases (60%) had malignant breast disease. In pre - menopausal women, the most commonbenign disease was fibroadenoma (64.28%) and commonest malignant disease was invasive ductal carcinoma (IDC) (50%) whereas in post - menopausal women, fibrocystic breast disease was commonest benign disease (85%) and IDC was the most common malignant disease (60%). Conclusion: This study revealed that the benign breast disease was more common in pre - menopausal women and earliest age of diagnosis was 24 years whereas malignant breast disease was more common in post - menopausal women and earliest age of diagnosis was 40 years. Among all women, fibroadenoma of breast was the most common benign disease and invasive ductal carcinoma was the most common malignant breast disease.***

Keywords: Breast lump; Premenopausal; Postmenopausal; Benign; Malignant Fibroadenoma; Carcinoma

1. Introduction

A breast lump is "Any discrete mass noticed by the patient, significant other, or physician". Benign mammary lumps and mastalgia are the most common breast disorders. Breast lumps may either be a manifestation of benign pathologies, such as fat necrosis, fibroadenoma, acute or chronic breast abscess, or a sinister carcinoma breast [1]. Furthermore, most of the breast swellings are benign and only 5 - 10% of the swellings are malignant, worldwide, accounting for 24% of new cancer cases and 15% of cancer deaths in 2018, [2].

Distinguishing the breast cancer burden by menopausal status is important for many reasons. First, this hormonal cancer of the mammary gland has distinct molecular features and causes at premenopausal and postmenopausal ages; for example, while excess body weight is a risk factor for postmenopausal breast cancer, the relation with premenopausal cancer is less clear, with some research suggesting an inverse association [3, 4]. Second, breast cancer's molecular subtypes (distinct in risk factors, therapeutic management, and prognosis) also have different age–incidence profiles at the time of menopause [5]. Third, from the public and patient health perspective, the size of female populations at risk of premenopausal versus postmenopausal breast cancer differs greatly between countries depending on population age structures. Fourth, early detection of breast cancer is more difficult in premenopausal women because of breast density, with cancers typically identified at later stages. Finally, the outcomes of the disease on women affected by breast cancer differ between younger and older patients. Thus, investigation of the breast cancer burden and related trends by menopausal status is important to inform prevention and detection initiatives and healthcare planning [6].

Distinguishing between benign and malignant breast lesions solely by a clinical/physical examination is subjective and clinician dependent and carries a risk of uncertainty and error. Core biopsy is considered to be a reliable test used in the detection of breast cancer; however, it requires time and expertise and can be a painful experience. Hence, the triple assessment for a lump in the breast is standard practice but the robustness of assessment towards the diagnosis of breast cancer is crucial. The triple assessment of breast swelling includes combination of modalities like physical examination, imaging (mammogram and ultrasound), and fine needle aspiration cytology (FNAC) is more accurate than any modality done alone [7]. Hence, the present study was conducted with an objective to check for the most common benign and malignant breast swelling; to determine and identify benign and malignant breast lump in premenopausal and postmenopausal woman.

2. Materials and Methods

After obtaining Institutional Ethical Committee approval and written informed consent from all the patients, this cross - sectional observational study was conducted in the Department of Surgery at Tertiary Care Centre in central India during a period of 2 years from December 2020 to December 2022. Patient attending surgery OPD or indoor patient in the surgery department of age >18 years who had complaints of a lump in the breast and natural cessation of a menstrual bleed were included in the study. Total 100 female patients were enrolled in the study and divided into two groups based on their menstrual status. Female patients who had no menstrual bleeding for the last 12 months were included in postmenopausal group (50 patients) and other patients were considered premenopausal (50 patients). Females who had natural cessation of menstrual bleeding were only included in the study population. Patients who had

undergone hysterectomy or were having ovarian problems and those patients whose menopausal status was not specified; patients taking oral contraceptive medications or other hormonal medications; patients with a personal history of cancer other than breast cancer were excluded from the study.

Physical examination of the breast was done bilaterally for all patients where skin changes, discharge, or bleeding from the nipple with lumps being noted during the examination. The characteristic of the lump was recorded including shape, size, location, edges, mobility, adherence to skin or underlying structures and tenderness were all noted. Along with the breast examination, the axilla and supraclavicular fossa was also examined bilaterally for assessment of lymph adenopathy with any signs of distant metastasis was examined. Patients were studied with respect to clinical examination, histopathological and ultrasound examination in detail while selected patients were made to undergo a mammogram of the breast. Fine needle aspiration cytology (FNAC) was done for all patients while in some patients where FNAC were inconclusive were subjected to core needle biopsy. For all operated cases, post - operative tissue specimen was sent for histopathological examination.

Statistical analysis

The data were collected and entered in Microsoft Excel sheet and then statistically analyzed using SPSS Version 20.0. Continuous variables were expressed as mean ± SD and categorical variables were summarized as frequencies and percentages.

3. Observations and Results

Out of 100 female patients, 50 patients had attained pre - menopausal status and 50 patients were post - menopausal. From the table 1 it was observed that more than half of the patients (56%) were diagnosed between 41 and 60 years old. However, out of the 50 post - menopausal women 44% attained menopausal status at 45 years or earlier and the rest 56% attained menopause after 45 years of age. Overall, the mean age of patients was 48.6±14.3 years, ranging from 24 to 77 years.

Table 1: Distribution of patients according to age in both the groups

Age (Years)	Pre - menopausal	Post - menopausal	Total
24 to 30	11 (22.0%)	00 (0.0%)	11 (11.0%)
31 to 40	17 (34.0%)	01 (2.0%)	18 (18.0%)
41 to 50	19 (38.0%)	21 (42.0%)	40 (40.0%)
51 to 60	03 (6.0%)	13 (26.0%)	16 (16.0%)
61 to 70	00 (0.0%)	10 (20.0%)	10 (10.0%)
71 to 80	00 (0.0%)	05 (10.0%)	05 (5.0%)
Total	50 (100.0%)	50 (100.0%)	100 (100.0%)

All the patients presented with a lump in the breast. Pain, nipple retraction and nipple discharge were present in some patients along with a lump in the breast as depicted in figure 1. Out of the total 100 patients, 58% of patients presented with a history of 2 - 6 months duration, 26% of patients had presented with complaints of more than 12 months duration and 16% of patients presented with 7 - 12 months duration of symptoms.

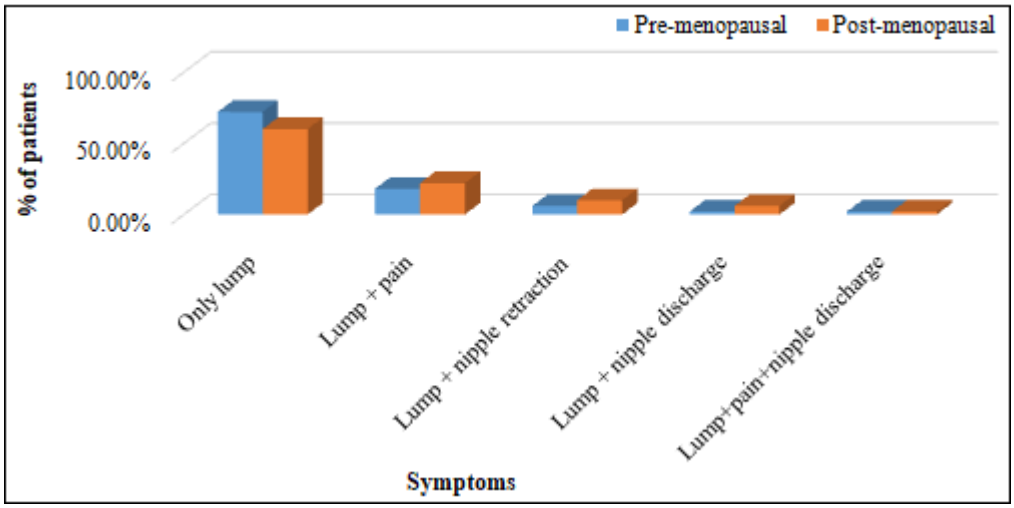

Figure 1: Distribution of clinical presentation between studied group

Out of 100 patients, about 51 patients had a lump in the right breast and 49 patients had a lump in the left breast. In the majority of the patients, the lump was present in the central quadrant and upper quadrant as depicted in figure 2.

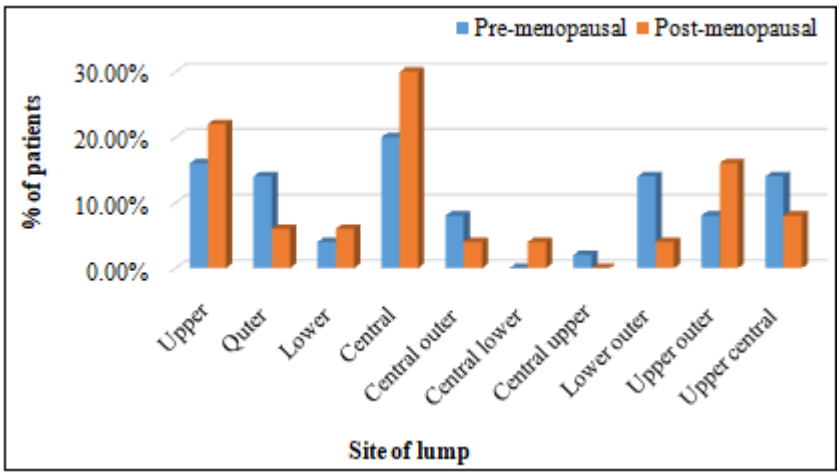

Figure 2: Site of lump between studied group

All patients were clinically examined for the lump and axillary nodes and findings are shown in figure 3.

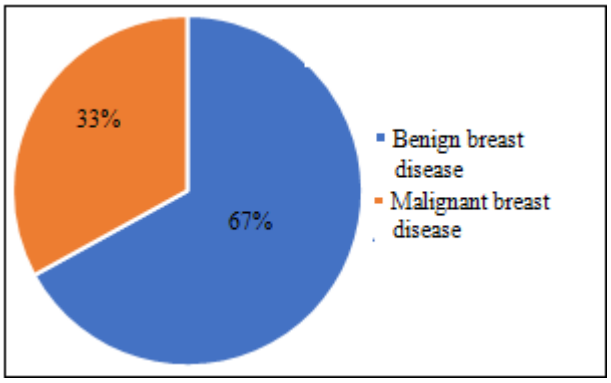

Figure 3: Clinical examination findings

Among the total 100 patients studied, 64 patients were reported as probably benign, and 26 patients were probably malignant. In 10 patient's ultrasound examination was inconclusive. However, the most common USG finding was malignant lesion 26 (26.0%), fibro adenoma 25 (25%) followed by benign lesion 20 (20%). Breast abscess & Fibro adenosis accounted for 6% and 5% respectively, (Table 2).

Table 2: Distribution of study participants based on USG findings

USG Findings	No. of patients	Percentage
Fibroadenoma	25	25.0
Breast abscess	06	6.0
Benign lesion	20	20.0
Duct ectasia	04	4.0
Fibro adenosis	05	5.0
Galactocele	03	3.0
Hematoma	01	1.0
Malignant lesion	26	26.0
Inconclusive	10	10.0
Total	100	100.0

In selected patients' mammogram and MRI of the breast were taken.31 patients were examined for mammogram findings. Out of them malignant lesion was found in 15 (48.38%) cases and benign lesion in 11 (35.48%) with fibro adenoma among 5 (16.12%) cases, (Figure 4).

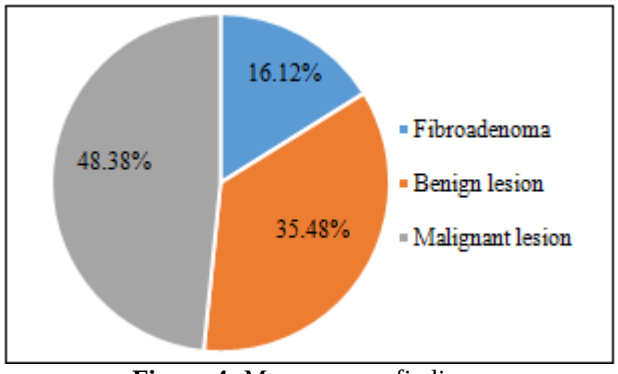

Figure 4: Mammogram findings

From the figure 5, it was observed that, in pre - menopausal women, the maximum cases (84%) had benign breast disease while post - menopausal women had malignant breast disease (60%).

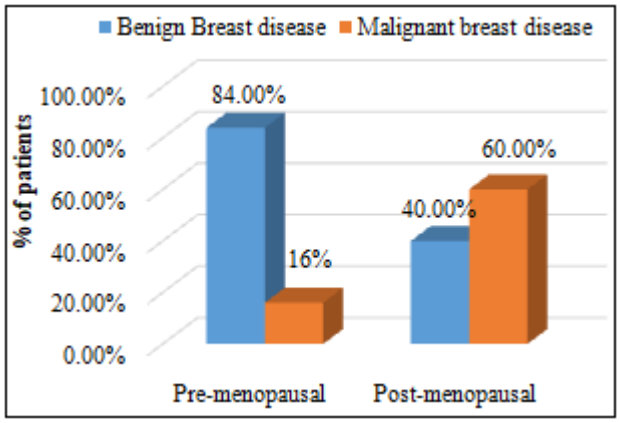

Figure 5: Comparison of benign and malignant cases between two groups

FNAC findings - among the total 100 patients, 62 patients had benign breast disease and 38 patients had malignant breast disease. The most common FNAC finding was Fibro adenoma 27 (27.0%), followed by fibrocystic disease of breast 25 (25.0%), invasive ductal carcinoma of breast NST 22 (22.0%) and Invasive lobular carcinoma of breast 13 (13.0%), (Table 3).

Table 3: Distribution of study participants based on FNAC findings (n=100)

FNAC findings		Frequency	Percentage
Benign breast lump	Fibroadenoma	27	27.0
	Galactocele	03	3.0
	Fibrocystic breast disease	25	25.0
	Benign phyllodes tumor of breast	02	2.0
	Lipoma of breast.	01	1.0
	Intraductal papilloma of breast	01	1.0
	Duct ectasia	02	2.0
	Chronic breast abscess	01	1.0
Malignant breast lump	Invasive medullary carcinoma of breast	02	2.0
	Invasive lobular carcinoma of breast	13	13.0
	Invasive ductal carcinoma of breast NST	22	22.0
	Inflammatory carcinoma breast	01	1.0

Core needle biopsy (CNB) was done in 28 patients in whom FNAC results were inconclusive. The most common CNB finding was fibroadenosis 12 (42.85%) followed by invasive ductal carcinoma 7 (25.0%), and invasive lobular carcinoma of breast 4 (14.28%) as shown in table 4.

Table 4: Distribution of patients based on core needle biopsy findings (N=28)

Core needle biopsy findings	No. of patients	Percentage
Fibroadenosis (Fibrocystic breast disease)	12	42.85
Invasive ductal carcinoma	07	25.0
Invasive medullary carcinoma of breast	02	7.14
Invasive lobular carcinoma of breast	04	14.28
Inconclusive	03	10.71
Total	28	100.0

Out of the total 100 patients, 84 patients underwent surgery. All post - operative specimens were sent for histopathological examination and final HPE reports were collected for all the patients. Among pre - menopausal women with benign diseases, a maximum of patients 27 (64.28%) were diagnosed with fibroadenoma.8 patients (19.04%) were diagnosed with fibrocystic disease of the breast while among pre - menopausal women with malignant disease, maximum i. e., 4 patients (50%) were diagnosed with invasive ductal carcinoma NST/NOS.3 patients (37.5%) were diagnosed with invasive lobular carcinoma.1 patient (12.5%) was diagnosed with invasive medullary carcinoma as shown in table 5.

Table 5: Distribution of pre - menopausal women with benign and malignant diseases

Histopathological Findings		Frequency	Percentage
Benign breast lump	Fibroadenoma	27	64.28
	Galactocele	03	7.14
	Fibrocystic breast disease	08	19.04
	Benign phyllodes tumor of the breast	02	4.76
	Lipoma of breast	01	2.38
	Chronic breast abscess	01	2.38
Malignant breast lump	Invasive medullary carcinoma of the breast	01	12.5
	Invasive lobular carcinoma of the breast	04	50.0
	Invasive ductal carcinoma of breast NST	03	37.5

Among post - menopausal women with benign disease, maximum i. e., 17 patients (85%) were diagnosed with fibrocystic breast disease while among post - menopausal women with malignant breast disease, most of the patients 18 (60%) were diagnosed with invasive ductal carcinoma followed by invasive lobular carcinoma (10; 33.33%) as shown in Table 6.

Table 6: Distribution of post - menopausal women with benign and malignant diseases

Histopathological Findings		Frequency	Percentage
Benign breast lump	Fibrocystic breast disease	17	85.0
	Intraductal papilloma of breast	01	5.0
	Duct ectasia	02	10.0
Malignant breast lump	Invasive medullary carcinoma of the breast	01	3.33
	Invasive lobular carcinoma of the breast	10	33.33
	Invasive ductal carcinoma of breast NST	18	60.0
	Inflammatory carcinoma breast	01	3.33

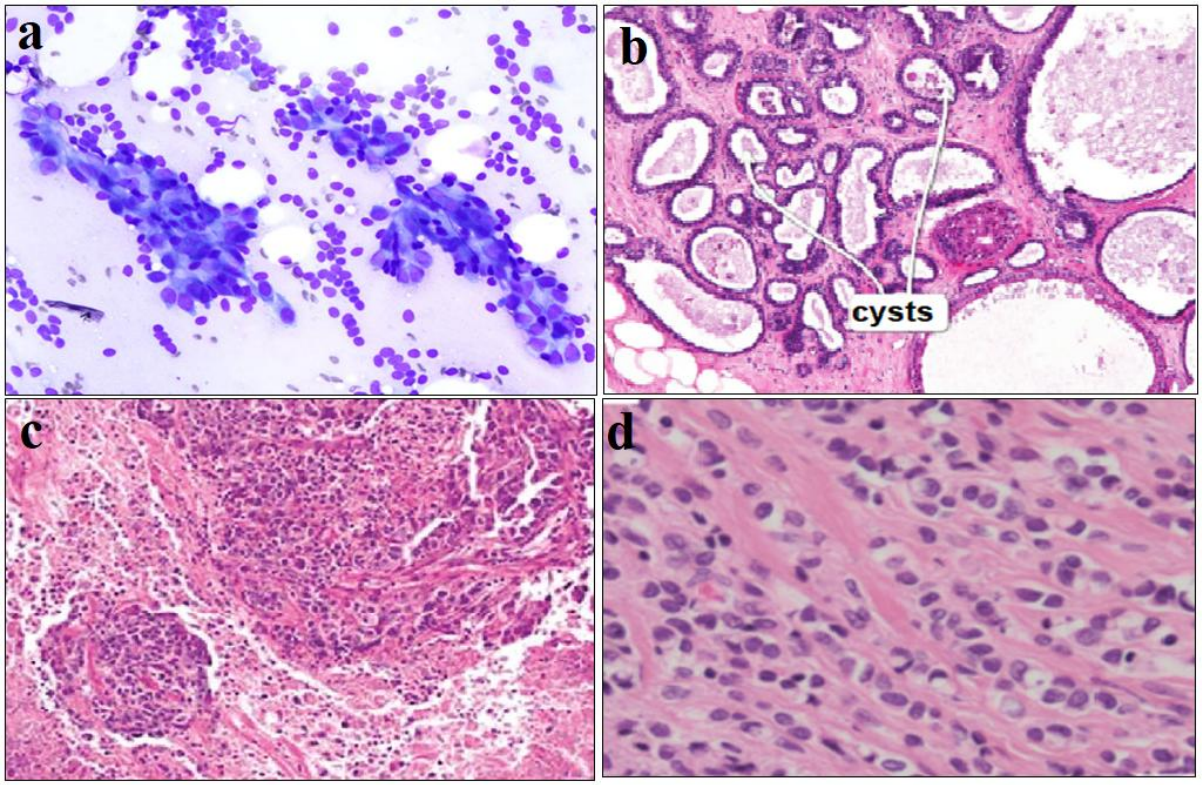

Figure 6: a) Breast fibroadenoma by fine needle aspiration cytology**; b)** The histological appearance of fibrocystic change of the breast. There are numerous small cysts surrounded by fibrous tissue**; c)** Invasive ductal carcinoma of no special type of breast cancer**; d)** Invasive lobular carcinoma; note the small, uniform cells in single files.

4. Discussion

In the present study, the majority of patients were between the fifth decade (41 - 50 years) of their life similar to studies reported from India and other Asian countries [95]. A majority of premenopausal patients were in fourth and fifth decade of their life and the majority of postmenopausal were in fifth and sixth decade of their life. Overall, the mean age of patients was 48.6±14.3 years, ranging from 24 to 77 years which is comparable with the study conducted by Surakasula et al [8] and Sankar VB study [9]. The maximum number of patients were presented with only lump (66%), in right breast (51%), in the central quadrant and upper quadrant with a history of 2 - 6 months duration. These findings are in accordance with the study done by Surakasula et al [8] and Sankar VB study [9].

All patients were clinically examined showed around 67 patients were diagnosed with benign breast disease and the rest 33 patients were diagnosed with malignant breast disease. The most common ultrasound finding was malignant lesion (26.0%), fibro adenoma (25%) followed by benign lesion (20%). Breast abscess and Fibro adenosis accounted for 6% and 5% respectively. The mammogram was done in 31 patients. Among them malignant lesion was found in 15 (48.38%) cases and benign lesion in 11 (35.48%) with fibro adenoma among 5 (16.12%) cases. These findings are similar to the study conducted by Lakshmana R et al [10].

62 (62%) patients had benign breast disease and 38 (38%) patients had malignant breast diseaseby FNAC which is comparable with the previous studies [10 - 12]. The benign breast disease was more common in pre - menopausal women (84%) of all benign cases whereas 40% of post - menopausal women had benign disease. However, it was observed that malignant breast disease was more common in post - menopausal women (60%) of all malignant cases whereas only 16% of pre - menopausal women had a malignant disease. These findings are comparable with the study done by Sankar VB [9] and Lakshmana R et al [10].

Based on the overall incidence of breast lesion in current study fibroadenoma was the most common FNAC finding accounted for 27 (27.0%), followed by fibrocystic disease of breast 25 (25.0%), invasive ductal carcinoma of breast NST 22 (22.0%) and Invasive lobular carcinoma of breast 13 (13.0%). galactocele diagnosed in 3 cases. Invasive medullary carcinoma of breast, benign phyllodes tumor of breast and duct ectasia were found in 2 (2.0%) cases each whereas lipoma of breast, intraductal papilloma of breast, inflammatory carcinoma breast and chronic breast abscess were found in 1 case each. There are similar findings are seen in other studies [10 - 13]. However, the most common CNB finding was fibroadenosis 12 (42.85%) followed by Invasive ductal carcinoma 7 (25.0%), Invasive lobular carcinoma of breast 4 (14.28%) and invasive medullary carcinoma of breast 2 (7.14%). These results are in accordance with the study conducted by Sankar VB [9] and Lakshmana R et al [10].

In present study based on the incidence of benign breast lesion and malignant breast lesion among pre - menopausal women, it was 42 (84%) and 8 (16%) respectively. ***Among pre - menopausal women with benign diseases***, a maximum of patients 27 (64.28%) were diagnosed with

fibroadenoma.8 patients (19.04%) were diagnosed with fibrocystic disease of the breast, 2 patients (4.76%) were diagnosed with benign phyllodes tumor, 3 patients (7.14%) were diagnosed with galactocele, 1 (2.38%) patient was diagnosed as chronic breast disease and 1 patient (2.38%) was diagnosed as lipoma of the breast. ***Among pre - menopausal women with malignant disease***, 4 patients (50%) were diagnosed with invasive ductal carcinoma NST/NOS.3 patients (37.5%) were diagnosed with invasive lobular carcinoma.1 patient (12.5%) was diagnosed with invasive medullary carcinoma. Thus, **in pre - menopausal women**, the most common benign breast disease was fibroadenoma whereas the most common malignant breast disease were invasive ductal carcinoma and invasive lobular carcinoma. The percentage of invasive lobular carcinoma was very high in study group when compared to malignant breast disease in general population. Similar findings are reported in study carried out by Sankar VB [9] and Lakshmana R et al [10].

Based on the incidence of benign breast lesion and malignant breast lesion among the post - menopausal women, it was 40% and 60%. ***Among post - menopausal women with benign disease***, 17 patients (85%) were diagnosed with fibrocystic breast disease, and 1 patient (5.0%) was diagnosed with intraductal papilloma of the breast.2 patient (10%) was diagnosed with duct ectasia. ***Among post - menopausal women with malignant breast disease***, 18 patients (60%) were diagnosed with invasive ductal carcinoma.10 patients (33.33%) were diagnosed with invasive lobular carcinoma.1 patient (3.33%) was diagnosed with invasive medullary carcinoma and 1 patient (3.33%) was diagnosed with inflammatory carcinoma breast. Similar findings are reported in study carried out by Sankar VB [9], Lakshmana R et al [10] and Devi PS [14]. For postmenopausal women, as mammography plays a major role in early breast cancer detection, nearly 31 individuals underwent exclusively mammography as a part of regular screening over USG and some women had a family history of breast carcinoma. The combined results of USG and mammography findings were useful in finding fibroadenoma and fibroadenosis mainly, which were more effective than FNAC.

5. Conclusion

The present study revealed that the benign breast disease was more common in pre - menopausal women and earliest age of diagnosis was 24 years whereas malignant breast disease was more common in post - menopausal women and earliest age of diagnosis was 40 years. Among all women, fibroadenoma of breast was the most common benign disease and invasive ductal carcinoma was the most common malignant breast disease. However, in pre - and post - menopausal women, there is very high percentage of invasive ductal carcinoma breast when compared to patients with malignant breast disease in general population in India.

6. Limitations

The current study has certain limitations. First, the sample size of the study is small, results with a bigger sample size may vary or show different results. Second, the generalizability of study findings is limited, considering the study population is recruited from a single hospital. Third, information about genetic risk factors was absent.

Despite of limitations, this study can be useful in understanding the epidemiology of breast cancer in this region. In order to reduce the burden of breast cancer, a multi - sectorial approach and evidence - based strategies aiming at early detection and effective management of the disease should be implemented. Hence, public health programs that ensure access to appropriate, affordable diagnostic tests and treatment must be introduced.

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