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Role of Triple Assessment of Breast Lump in Premenopausal and Postmenopausal Women -A Comparative and Descriptive Study

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ABSTRACT

Triple assessment of breast is based on clinical examination, histological and radiological study where in our study, the pattern of breast swelling in a premenopausal and postmenopausal woman was compared. A total of 150 female patients with palpable breast lump went through clinical examination, FNAC, USG breast while mammogram & core needle biopsy was done in selected patients. Histopathological examination of the specimen was done for all post-operative patients. Benign & malignant breast lesion accounted for 82(54.6%) & 68(45.3%) respectively. Based on the incidence of benign breast lump & malignant breast lump among pre menopausal women, it was 79% & 21% respectively while in post menopausal women it was 21.9% & 78.1%. The most common type of breast lump among the pre and post menopausal women was fibroadenoma 56.9% & Invasive ductal carcinoma 59.3% respectively. The most common benign breast lump & malignant breast lesion based on the histological pattern among the premenopausal women was fibroadenoma 72% & Invasive ductal carcinoma 50% while in postmenopausal women it was fibroadenosis 71.4% & Invasive Ductal Carcinoma 76%. Based on the hormonal status(ER/PR) of pre and postmenopausal women positivity was seen majorly in post menopausal women 82.3% compared to premenopausal women 17.7%. In our study, the malignant breast disease was more common in post menopausal, while benign breast disease was common in pre menopausal women. Triple assessment in evaluating a breast lump is per se a reliable & valid tool in the armamentarium of treating clinician with very high diagnostic accuracy.

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INTRODUCTION

A breast lump is "Any discrete mass noticed by the patient, significant other, or physician". Benign lesions are seen in both males and females far more common than malignant lesions. 60 to 80% of breast lumps are benign. However, the most common concern is, a given lump may be the first evidence of breast cancer (Perry *et al.*, 1990). The most frequent cancer among women is breast cancer which impacts 2.1 million women each year, also causing the greatest number of cancer-related deaths among women. It is estimated that 627,000 women had died due to breast cancer in 2018 – accounting for 15% of all cancer deaths among

women approximately. To improve breast cancer outcomes, early detection is critical, and for survival, there are two strategies for breast cancer early detection - early diagnosis and screening. Majority of women are diagnosed in late stages due to limited resource settings & also with weak health systems, prioritization of early diagnosis programmes based on awareness of early signs and symptoms and prompt referral to diagnosis and treatment should be made (World Health Organization, 2015).

The global burden of breast cancer will increase to over 2 million new cases per year by 2030. Breast cancer incidence in INDIA (22.9%) is rising, and after cervical cancer, this is the second most commonly diagnosed cancer in women (Ferlay *et al.*, 2008).

A woman who experiences menopause after the age of 55 with the risk being greater if a woman began menstruating before age 12, there is an increased risk of ovarian, breast, and uterine cancers are seen. Woman's risk of breast cancers increases with longer exposure to oestrogen, so women who have been through natural menopause are more likely to develop cancer around as twice as high because of hormonal factors but the risk of developing cancer increases as a woman ages and not merely by menopause alone (Surakasula *et al.*, 2014).

Distinguishing of benign and malignant breast lesions solely by a clinical or physical examination is subjective as clinician dependent carries a risk of uncertainty and error. A reliable test used in the detection of breast cancer is core biopsy but it requires time and expertise and can be a painful experience. The combination of modalities like physical examination, imaging (mammogram and ultrasound), and fineneedle aspiration cytology (FNAC) is more accurate than any modality done alone.

The triple assessment for a lump in the breast is a standard practice, but the robustness of assessment towards the diagnosis of breast cancer is crucial (National Institute for Health and Care Excellence, 2017). Considering the above the factors the present study was conducted to compare the pre & post menopausal women with breast lump through triple assessment.

MATERIALS AND METHODS

Our study was done among 150 females who had attended the general surgery outpatient department with a breast lump. Patients were divided as premenopausal and postmenopausal based on their menstrual status. We included Females having a clinically palpable Breast Lump/swelling & patients who had no menstrual bleed for the past 12 months were included in a postmenopausal category while other female patients were considered in the premenopausal category. After obtaining informed consent, patients were studied in with regards to clinical examination, histopathological and ultrasound examination in detail while selected patients were made to undergo mammogram and MRI of the breast.

Fine needle aspiration cytology (FNAC) was done for all patients while in some patients where FNAC were inconclusive was subjected to core needle biopsy. For all operated cases, post-operative tissue specimen was sent for histopathological examination, ER/PR status was also assessed. Patients with suspected malignancy were made to undergo metastatic workup like chest X-ray, X-ray of bones, routine blood investigation, ultrasound abdomen. The results were evaluated in 2 groups - Group 1-Premenopausal women Group 2-Post menopausal women.

Physical Examination

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 lump was recorded including shape, size, location, edges, and mobility, adherence to skin or underlying structures and tenderness was all noted. Along with the breast examination, axilla and supraclavicular fossa was also examined bilaterally for assessment of lymph adenopath with any signs of distant metastasis was examined.

USG

A High Definition Ultra Sonography Breast (HDUSG) was used during the study where the patient was made to lie on supine or oblique position with the ipsilateral arm above the head. The breast to be scanned was done on transverse or sagittal or radial and anti-radial planes.

FNAC

FNAC was done among the patients using a twenty-two gauge needle and twenty-millilitre syringes. The needle was inserted into the breast lump after the breast mass was immobilized. Inside the mass, the needle was moved back and forth with the material being expelled onto a glass slide fixed by air drying and was stained with Giemsa and hematoxylin and eosin.

Slides from patients were examined by the pathologist, and the diagnosis based on cytology of the breast masses was given.

Mammography

Based on standard guidelines mammography was performed. A craniocaudal view of breast was taken with two views being obtained: the lateral oblique view and a view with the tube angled at forty-five degrees to the horizontal axis. Irregular borders, microcalcifications, speculated density, loss of breast architecture, and skin retraction suggests malignant disorder while a well circumscribed mass with regular borders is suggestive of benign disorders (Jan *et al.*, 2010).

RESULTS

In our study, the mean age of the study participants was 40.3 years (S.D - 15.1 years). In our study based on the breast lesion, benign & malignant accounted for 54.6% & 45.3% respectively. In our study based on the incidence of benign breast lump & malignant breast lump among pre menopausal women, it was 79% & 21% respectively. Based on the incidence of benign breast lesion & malignant breast lesion among the post menopausal women, it was 21.9% & 78.1% respectively. The most high-risk group for carcinoma breast in our study was post menopausal women.

The most common type of breast lump among the premenopausal women was fibroadenoma 56.9%. The most common benign breast lump based on the histological pattern among the premenopausal women was fibroadenoma 72%, the most commonest malignant breast lesion in the premenopausal women was Invasive ductal carcinoma 50% in our study.

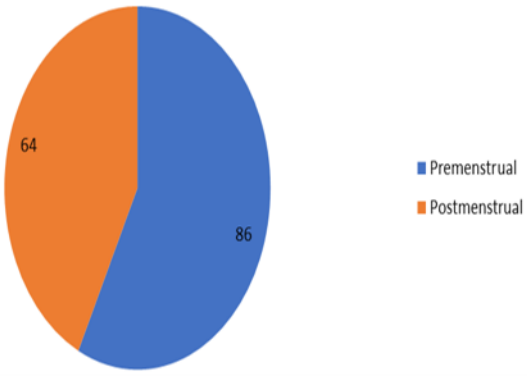

Figure 1: Distribution of Study Participants Based on Menstrual Status

The most common type of breast lump in post menopausal women was Invasive ductal carcinoma 59.3%. The most common benign breast lump based on the histological pattern among the post menopausal women was fibroadenosis 71.4% & the most common malignant breast lesion among the post menopausal women was Invasive Ductal Carcinoma 76%.

Based on the hormonal status(ER/PR) of pre and postmenopausal women positivity was seen majorly in post menopausal women 82.3% compared to premenopausal women 17.7%.

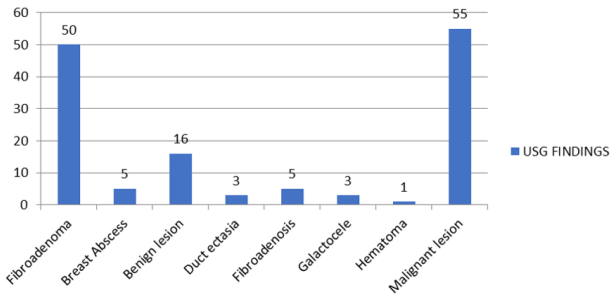

Figure 2: Distribution of Study Participants Based on USG Findings

Figure 2 shows the distribution of USG findings among the study participants of which the most common finding was malignant lesion 55(36.7%), fibro adenoma 50 (33.3%) followed by benign lesion 16(10.7%). Breast abscess & Fibro adenosis accounted for 3.3%.

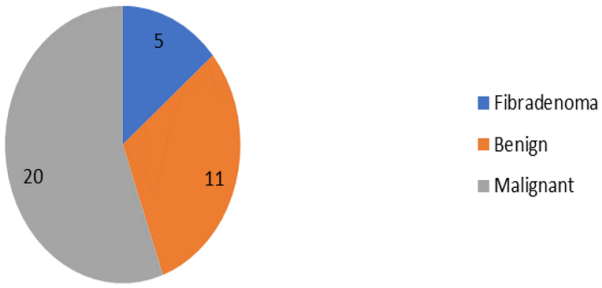

Figure 3: Distribution of Study Participants Based on Mammogram findings

Figure 3 shows the distribution of mammogram findings among the study participants in which thirty-six patients were examined. The malignant lesion was found in 20(55%) & benign lesion in 11(30.5%) with fibro adenoma among 5(13.8%).

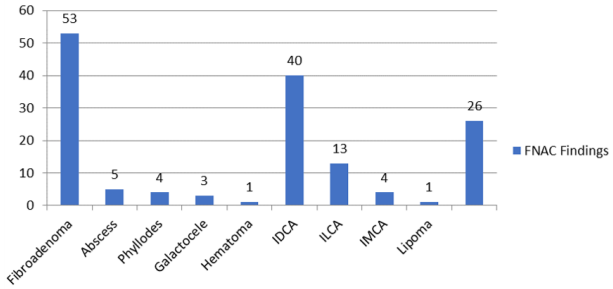

Figure 4: Distribution of Study Participants Based on FNAC findings

Figure 4 shows the distribution of FNAC findings among the study participants in which the most common finding was Fibro adenoma 53(35.3%), followed by Invasive ductal carcinoma 40 (26.7%), Invasive lobular carcinoma 13(8.7%), Invasive medullary carcinoma 4(2.7%). Inconclusive results accounted for 26 (17.3%).

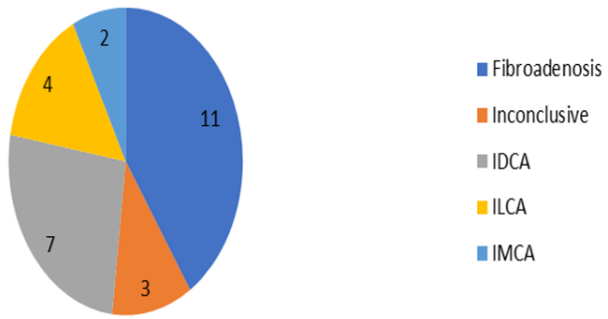

Figure 5: Distribution of Study Participants Based on Core needle biopsy findings

Figure 5 Distribution of Study Participants Based on Core needle biopsy findings among the study participants, which was done for 27 participants. The most common finding was fibroadenosis 11(40.7%), Invasive ductal carcinoma 7(25.9%).

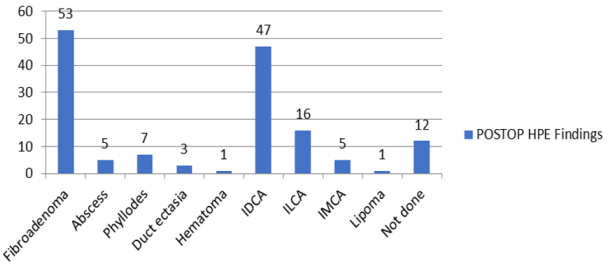

Figure 6: Distribution of Study Participants Based on Post Operative Histo Pathological Examination findings

Figure 6 shows the distribution of Post OP HPE findings among the study participants which was done for 138 participants of which the most common finding is Fibro adenoma 53(35.3%), Invasive ductal carcinoma 47(31.3%), Invasive lobular carcinoma 16(10.7%), Phyllodes 7(4.7%), Breast abscess 5(3.3%) & Invasive medullary carcinoma 5(3.3%).

Table 1 shows the distribution of study participants based on the age group the most common age group was 31-40 years 51(34%), followed by 15-30 years 47(31.3%), 41-60 years 35(23.3%), 61 & above 17(11.3%). The mean age of the study participants was 40.3 years (S.D-15.1 years) with the lower range was 15 years & highest range was 82 years.

Table 2 shows the distribution of study participants based on the menstrual status of which

Table 1: Distribution of Study Participants based on Age

Age Group	Number of Participants	Percentage (%)
15-30 yrs	47	31.3
31-40 yrs	51	34.0
41-60 yrs	35	23.3
61 & above	17	11.3
Total	150	100.0

Table 2: Distribution of Study Participants Based on Menstrual Status

Menstrual Status	Number of Participants	Percentage
Premenopausal	86	57.3
Postmenopausal	64	42.7
Total	150	100.0

pre menopausal women were 86(57.3%) & post menopausal women were 64 (42.7%).

Table 3 shows the distribution of breast lesion among the premenopausal women where the most common breast lesion was fibroadenoma 49(56.9%), IDCA 9(10.4%), phyllodes 7(8.1%), abscess 5(5.8%), IMCA 5(5.8%). The most common benign breast lesion among the premenopausal women was fibroadenoma 49(72%). Most common malignant breast lesion in the premenopausal women was invasive ductal carcinoma 9(50%).

As shown in Table 4, Based on the distribution of breast lesion in the post menopausal women the most commonest breast lesion was IDCA 38(59.3%), followed by ILCA 12(18.7%), fibroadenosis 10(15.6%) & fibroadenoma 4(6.2%). The most common benign breast lesion among the post menopausal women was fibroadenosis 10 (71.4%), & the most common malignant breast lesion among the post menopausal women was IDCA 38(76%).

Table 5 shows the distribution of ER/PR status among the pre & postmenopausal women with breast carcinoma of which ER/PR is positive majorly in post menopausal women 42(82.3%) compared to premenopausal women 9(17.7%).

Table 6 shows the ER/PR status based on post-op HPE findings among the study participants which showed positivity for Invasive ductal carcinoma was 38(55%), Invasive lobular carcinoma 13(19.1%).

Table 3: Distribution of Benign Lesion & Malignant Lesion among Premenopausal Women

Lesion Type	Findings	USG & Mammo	FNAC & CNB	HPE
Benign	Fibroadenoma	49	49	49
	Fibroadenosis	0	2	-
	Breast Abscess	5	5	5
	Phyllodes	-	4	7
	Duct Ectasia	3	-	3
	Hematoma	1	1	1
	Lipoma	1	1	1
	Galactocele	3	3	-
Malignant	IDCA		9	9
	ILCA	18	4	4
	IMCA		5	5

Table 4: Distribution of Benign Lesion & Malignant Lesion among Postmenopausal Women

Lesion Type	Findings	USG & Mammogram	FNAC & CNB	HPE
Benign	Fibroadenoma	4	4	4
	Fibroadenosis	5	10	-
	Breast Abscess	0	0	0
	Phyllodes	-	0	0
	Duct Ectasia	0	-	0
	Hematoma	0	0	0
	Lipoma	0	0	0
	Galactocele	0	-	-
Malignant	IDCA		38	38
	ILCA	42	12	12
	IMCA		0	0

Table 5: Distribution of ER/PR status among the study participants with breast carcinoma cases based on Pre & Post menopause women

ER/PR Status	Premenopause Women	Postmenopause Women	Total
Negative	9	8	17
Positive	9	42	51

Table 6: Distribution of ER/PR status based on Post-op HPE findings among the study participants

ER/PR Status	IDCA	ILCA	IMCA
Negative	9	3	5
Positive	38	13	0

DISCUSSION

The present study was conducted among women who attended the general surgery OPD with a breast lump in SRM hospital. This study consisted of 150 women falling in pre & post-menopausal category where the incidence of benign & malignant breast lesion was observed.

The mean age of the study participants was 40.3 years (S.D-15.1 years) with the lower range was 15 years & highest range was 82 years with the most common age group being 31-40 years 51(34%) which was similar to Irfan et al & Laul et al study findings were 23-80 years with 31-40 years being common, Aruna et al also showed mean age as 47.7% (24-80 years).

In our study based on the breast lesion, benign &

malignant accounted for 54.6% & 45.3% respectively. The results were similar to other studies Sadik *et al.* (2014)were benign breast lesion accounted for 53.8% & malignant breast lesion 46.3% but a higher incidence of benign lesions was found in other studies were Mandal et al[6] showed 76.8% benign & malignant breast lesion 23.1%, Laul *et al.* (2020) showed 94.2% benign breast lesion & 5.8% malignant lesion, Jain and Jain (2019) showed 67.2% benign & 32.8% malignant breast lesion.

Based on the overall incidence of breast lesion in our study fibroadenoma accounted for 53(35.3%), IDCA 47(31.3%), ILCA 16(10.6%), fibroadenosis 12(8%). Other lesion were Phyllodes 7(4.6%), abscess & IMCA 5(3.3%) & 5(3.3%) respectively, duct ectasia 3(2%), lipoma & hematoma 2(1.3%) in our study. There were similar findings seen in Mandal et al were the most common lesion was fibroadenoma which accounted for 40.5%, Sadik *et al.* (2014) 40.7%, Vimal and Chitra (2016) 55.4%, Karki *et al.* (2015) 27%. Fibroadenoma is the most common type of benign tumor which is typically well-defined round/oval with a rubbery feeling which accounts for 15% among the overall breast lesion. Other lesion like Phyllodes tumor 4.2% in Mandal *et al.* (2020); Bangaru *et al.* (2017) 3.1%, breast abscess 2.7% in Vimal and Chitra (2016), 5% in Karki *et al.* (2015).

Based on the pre & post-menopausal distribution of breast carcinoma in our study, it's 18(26.4%) & 50(73.5%) which shows a higher predominance in post menopausal women. Similar results of breast cancer were seen in studies done by Godinho-Mota *et al.* (2019) 40.6% & 59.4% in pre & Postmenopausal women, Surakasula *et al.* (2014) premenopausal women(48%), post menopausal women 52%; Butt *et al.* (2012) 42.7 in pre & 57.3% in post menopausal women. Breast cancer occurrence increases as the age increases as there may be changes in the breast tissue due to puberty, breast size, breast density, physical activity, pregnancy, parity, hormonal influences, usage of OCP combination of progestins & estrogen and age at menopause. Benign breast disease is a common presentation among premenopausal women.

Of all the breast cancer type IDCA accounted for 47(69.1%), ILCA 16(23.5%) & IMCA 5(7.3%). Studies conducted by Mandal *et al.* (2020); Irfan *et al.* (2019) showed a very incidence of IDCA 91.8% & 93%. ILCA was seen as the second most common type as seen in our study in studies conducted by Surakasula *et al.* (2014); Irfan *et al.* (2019) IMCA accounted for 6% in a study conducted by Surakasula *et al.* (2014) with IMCA seen in premenopausal women as our study findings.

In our study based on the incidence of benign breast lesion & malignant breast lesion among pre menopausal women, it was 68(79%) & 18(21%) respectively. The most common breast lesion among the premenopausal women was fibroadenoma 49(56.9%), IDCA 9(10.4%), phyllodes 7(8.1%), abscess 5(5.8%), IMCA 5(5.8%). The most common benign breast lesion among the premenopausal women was fibroadenoma 49(72%), the commonest malignant breast lesion in the premenopausal women was Invasive ductal carcinoma 9(50%). Findings of IDCA incidence was similar to study results of Surakasula *et al.* (2014), where of the breast cancer 46% were of IDCA type.

Based on the incidence of benign breast lesion & malignant breast lesion among the post menopausal women, it was 21.9% & 78.1%. The most common breast lesion was IDCA 38(59.3%), followed by ILCA 12(18.7%), fibroadenosis 10(15.6%) & fibroadenoma 4(6.2%). The most common benign breast lesion among the post menopausal women was fibroadenosis 10 (71.4%), & the most common malignant breast lesion among the post menopausal women was IDCA 38(76%).

Based on USG findings our study was able to detect 94.3% of fibroadenoma cases which was similar to study results of Mandal *et al.* (2020); Shashikala (2016) 90%, Bangaru *et al.* (2017) 85%. For postmenopausal women, as mammography plays a major role in early breast cancer detection, nearly 12 individuals underwent exclusively mammography as a part of regular screening over USG & some women had a family history of breast carcinoma. The combined results of USG & mammography findings were useful in finding fibroadenoma & fibroadenosis mainly, which were more effective than FNAC.

Core needle biopsies were done in patients when FNAC results were inconclusive. The diagnostic accuracy improved for identifying fibroadenosis, which was elicited in 5 patients using USG but not on FNAC. FNAC had good diagnosing accuracy for identifying fibroadenoma 100% in our study with similar results were Shashikala et al. was also able to identify fibroadenoma 99% using FNAC. As in cytology, there is a proliferation of epithelium in single terminal duct unit with duct-like spaces being surrounded by stroma with cells showing no atypia, so the diagnostic accuracy is maintained due to easy identification of the cell proliferation.

The distribution of ER/PR status among the pre & postmenopausal women with breast carcinoma of which ER/PR is positive majorly in post menopausal

women 42(82.3%) compared to premenopausal women 9(17.7%). Similar results were seen in studies done by Chollet-Hinton *et al.* (2016); Onitilo *et al.* (2009) were ER/PR positivity is seen in postmenopausal women breast carcinoma, but in a study done by Eliassen *et al.* (2006) ER/PR, positivity is seen more in premenopausal women than in post menopausal women.

The triple assessment of breast lesion/lump using clinical, radiological & FNAC/CNB is giving an efficacy which is way better than using a single modality of assessment. The combinations of techniques increase the reliability of determining the cause of a clinical or image-detected abnormality which helps in managing the patient in a better way & give a good outcome thereby reducing the burden of the disease & preventing any complications of the disease in a timely manner.

CONCLUSIONS

Triple assessment in evaluating a breast lump is per se a reliable & valid tool in the armamentarium of treating clinician with very high diagnostic accuracy. The study enlightens the different ways in which pre & post menstrual women with a breast lump can be evaluated when a triple assessment is used. Mammogram for post menopausal is better than USG as it picks any malignant lesion better where it proves that preoperative categorization of breast lesions is of utmost importance in the management of the patient and this will help to avoid any unnecessary surgical treatment. This study can aide in early detection and treatment of breast carcinoma, and with the hormonal status, treatment strategy & prognosis can be determined.

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Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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