Original Article

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Evaluation of Palpable Breast Lumps under the Age of 35 Years with Triple Assessment

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Abstract

Introduction: Breast is an important feature of female anatomy and representing feminity. Breast complaints are one of the most common reasons for surgical consultation. A quick, reliable, non-invasive or minimally invasive means of diagnosis helps to lessen the anxiety and aids in instituting early definitive care. Triple assessment has been considered the best combination of tests.

Aims: To study the pattern of age, duration, and pathology, the mode of onset and clinical manifestations, and to identify - malignant disorders of palpable breast lumps using triple assessment.

Materials and Methods: It is an observational cross-sectional study conducted in Mandya Institute of Medical Sciences from March 2015 to March 2016. All female patients below 35 years presented to the surgical outpatient department (OPD) with palpable breast lumps are assessed by triple assessment.

Results: Total of 80 patients were included in the study, among which mean age of presentation is 26.62 with standard deviation of 6.09, 42 had lumps in right breast (52%), 36 patients in left breast (45%), 14 out of 80 patients had positive axilla with palpable lymph nodes. 6 out of 80 patients had significant family history of breast carcinoma. The triple assessment was in favor of benign diagnosis in 41 (51.25%) patients while as the malignant diagnosis was made in 14 (17.5%) patients.

Conclusions: Triple assessment is a very useful diagnostic tool to evaluate patients with breast lumps and to detect patients with breast cancers with an overall accuracy of 99.3%. When the lumps are palpable clinically and of size more than 2 cm fine-needle aspiration cytology itself has a sensitivity of 100%. The triple assessment did not require hospitalization, can be performed on OPD basis, without any complications and it is the gold standard diagnostic tool for the palpable breast lumps in early detection of malignancy avoiding biopsies.

Key words: Palpable breast lump, Triple assessment, Ultrasonography of breast

INTRODUCTION

Mammary glands or breasts are a distinguishing future of mammals.[1] Breast is an important feature of female anatomy and representing feminity. From puberty to death, the breast is subjected to constant physical and physiological alterations that relate to menses, pregnancy, gestation, lactation, and menopause. This is unique because its development and growth are under the control of numerous hormones.

Breast masses in young women are common and cause much anxiety. The majority of these lesions are benign. In the modern society, females as they are more educated with increased medical awareness, they are more worried about any physiological or pathological changes in the breast, which causes more psychological and emotional trauma to the patients, when the patient suspects it may be a malignancy.

A quick, reliable, non-invasive or minimally invasive means of diagnosis helps to lessen the anxiety and aids in instituting early definitive care. Triple assessment has been considered the best combination of tests.

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The triple assessment is an evaluation of palpable breast masses by clinical breast examination (CBE), imaging and tissue sampling. Because of their mammographically dense breasts and the fear of exposing them to repeated radiation, ultrasonography (USG) is the first choice imaging method in young women (<35 years) with palpable breast masses.

MATERIALS AND METHODS

It is an observational cross-sectional study conducted in Mandya Institute of Medical Sciences from March 2015 to March 2015. All female patients below 35 years presented to surgical/oncosurgery outpatient department (OPD) with palpable breast lumps are assessed taking a detailed history regarding lump, pain, nipple discharge, menstrual history, obstetric history, history of oral contraceptive pills. General physical examination done. A detailed local and systemic examination was carried out, and clinical diagnosis was made.

Patients were subjected to USG of breast and fine-needle aspiration cytology (FNAC)/core biopsy.

RESULTS

Figure 1 shows the mean age of presentation is 26.62 with a standard deviation of 6.09 with mean duration of complaints 3.79 months with standard deviation of 2.75 months.

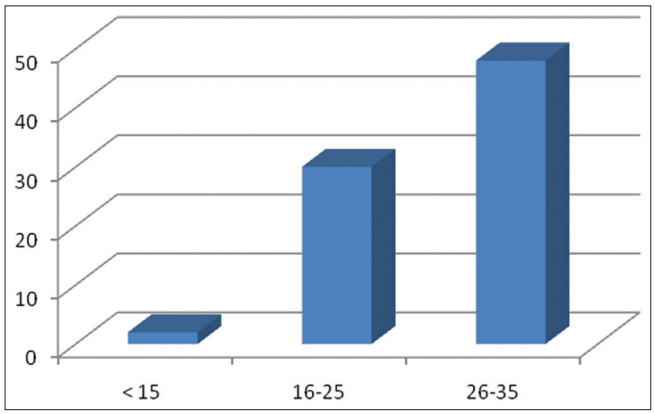

Figure 1: Age

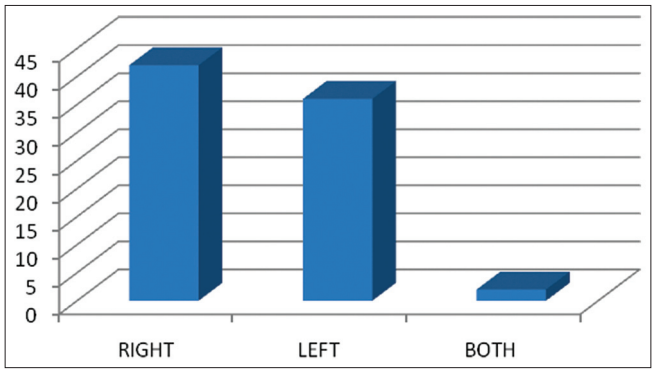

Figure 2: Site

Out of 80 patients, 42 had lumps in right breast (52%), 36 patients in left breast (45%), and 2 patients had lumps in both breasts (Figure 2).

About 59 out of 80 patients had lump in the upper outer quadrant (73.75%) and the remaining in other quadrants (Figure 3).

Chief complaints being palpable breast lumps in 53 patients (66.25%) with associated symptoms 27 patients (33.75%).

About 53 out of 80 had non-tender lumps and 14 out of 80 patients having significant changes over the skin (Figure 4).

About 52 out of 80 palpable lumps are of the firm in consistency, 23 being hard, and 5 being cystic (Figure 5).

All the 80 patients were subjected to HR-USG of the breast. Out of 80 patients, 45 (56.25%) patients had fibroadenoma, 18 (22.5%) had well defined solid masses, 5 (6.25%) had cystic lesion, and breast abscess in 8 (10%)

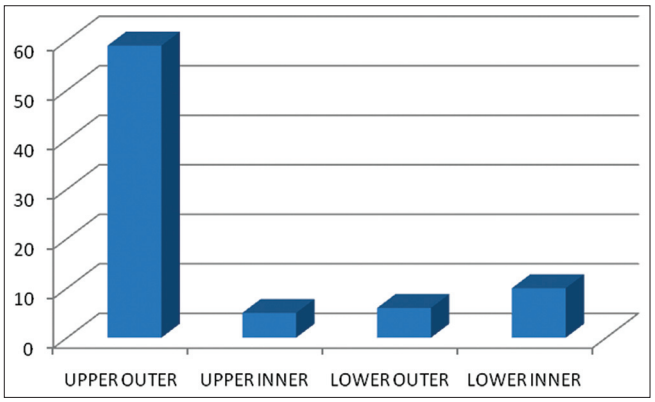

Figure 3: Distribution

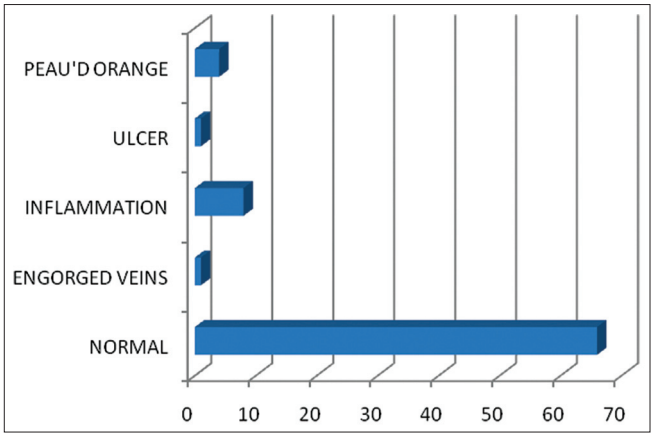

Figure 4: Skin changes

patients. Rests of patients were diagnosed as antibioma, lipoma, and galactocele (Table 1 and Figure 6).

All the 80 patients were taken for FNAC. Fibroadenoma was the most common FNAC diagnosis seen in 41 (51.25%) patients. Fibroadenosis was seen in 6 (7.5%) cases with galactocele in 5 patients, breast abscess in 7 patients, and ductal cell carcinoma of the breast in 14 (17.5%) patients (Figure 7).

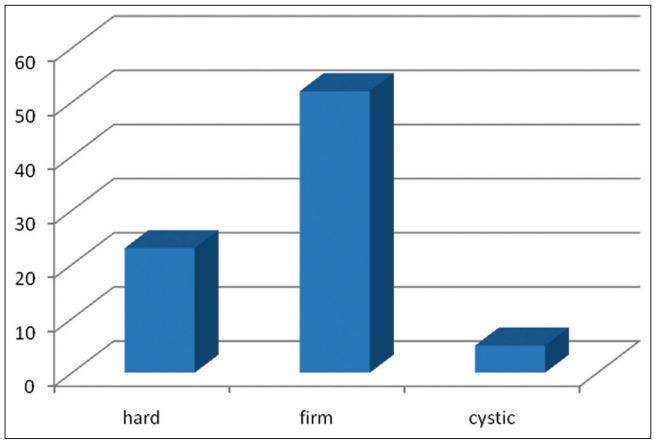

Figure 5: Consistency

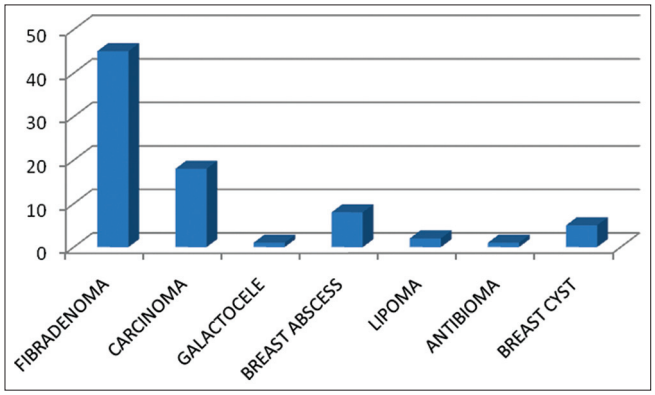

Figure 6: Ultrasonography

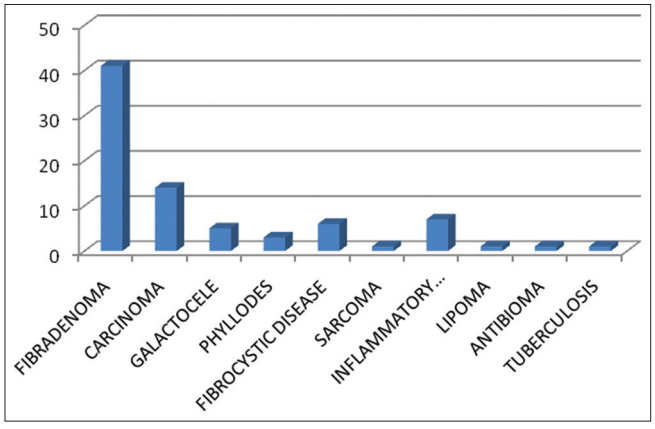

Figure 7: Fine-needle aspiration cytology diagnosis

The result of triple assessment was in favor of benign diagnosis in 41 (51.25%) patients while as the malignant diagnosis was made in 14 (17.5%) patients. Histopathology diagnosed fibroadenoma in 41 (51.25%) cases, breast abscess in 7 (8.75%) cases, infiltrating ductal cell carcinoma in 14 (17.5%) cases, and fibroadenosis in 6 (7.5%).

Table 2 shows physical examination when compared with histopathology had a concordance of 97.3%, positive predictive value (PPV) of 80%, negative predictive value (NPV) of 99.3%, sensitivity of 85.3%, and specificity of 82.7%. *P* value was significant (0.001).

Table 1 shows USG when compared with histopathology had a concordance of 96.7%, PPV of 66.7%, NPV of 100%, sensitivity of 85.8%, and specificity of 96.4%. *P* value was significant (0.001).

Table 3 shows FNAC results when compared with histopathology results showed a concordance of 97.3%, PPV of 73.3%, NPV of 100%, sensitivity of 98.5%, and specificity of 97.1%. *P* value was significant (0.001).

Table 1: Contingency analysis of final diagnosis by ultrasound

Count	AB	CA	FA	PT	FCD	GAL	TB	SA	BA	LIP	Total
AB	1	0	0	0	0	0	0	0	0	0	1
BC	0	0	0	0	0	4	1	0	0	0	5
CA	0	13	1	2	1	0	0	1	0	0	18
FA	0	1	40	2	2	0	0	0	0	0	45
GAL	0	0	0	0	0	1	0	0	0	0	1
BA	2	0	0	0	0	0	0	0	6	0	8
LIP	0	0	0	0	1	0	0	0	0	1	2
Total	3	14	41	4	4	5	1	1	6	1	80

AB: Antibioma, CA: Carcinoma, FA: Fibroadenoma, PT: Phylloides tumor, FCD: Fibrocystic disease, GAL: Galactocele, TB: Tuberculosis, BA: Breast abscess, LIP: Lipoma, SA: Sarcoma

Table 2: Contingency analysis of final diagnosis with clinical diagnosis

Count	AB	CA	FA	PT	FCD	GAL	TB	SA	BA	LIP	Total
AB	2	1	0	0	0	0	0	0	1	0	4
CA	0	12	3	1	1	0	1	1	0	0	19
FA	0	1	38	2	1	1	0	0	1	1	45
PT	1	0	0	1	0	0	0	0	0	0	2
FCD	0	0	0	0	2	0	0	0	0	0	2
GAL	0	0	0	0	0	3	0	0	1	0	4
BA	0	0	0	0	0	1	0	0	3	0	4
Total	3	14	41	4	4	5	1	1	6	1	80

P<0.001, AB: antibioma, CA: Carcinoma, FA: Fibroadenoma, PT: Phylloides tumor, FCD: Fibrocystic disease, GAL: Galactocele, TB: Tuberculosis, BA: Breast abscess, LIP: Lipoma, SA: Sarcoma

Table 3: Contingency analysis of final diagnosis with FNAC/core biopsy

Count	AB	CA	FA	PT	FCD	GAL	TB	SA	BA	LIP	Total
AB	1	0	0	0	0	0	0	0	0	0	1
CA	0	14	0	0	0	0	0	0	0	0	14
FA	0	0	40	1	0	0	0	0	0	0	41
PT	0	0	0	3	0	0	0	0	0	0	3
FCD	0	0	1	0	4	0	0	0	1	0	6
GAL	0	0	0	0	0	5	0	0	0	0	5
BFH	0	0	0	0	0	0	0	1	0	0	1
TB	0	0	0	0	0	0	1	0	0	0	1
BA	2	0	0	0	0	0	0	0	5	0	7
LIP	0	0	0	0	0	0	0	0	0	1	1
Total	3	14	41	4	4	5	1	1	6	1	80

AB: Antibioma, CA: Carcinoma, FA: Fibroadenoma, PT: Phylloides tumor, FCD: Fibrocystic disease, GAL: Galactocele, BFH: Benign fibrous histiocytoma, TB: Tuberculosis, BA: Breast abscess, LIP: Lipoma, FNAC: Fine-needle aspiration cytology, SA: Sarcoma

DISCUSSION

The mammary glands are modified sweat glands and are ectodermal in origin. The epithelial lining of ducts and the alveoli are derived from ectoderm and supporting fatty tissue and blood vessels by mesenchyme.

The greater part of the breast, about 2/3rd rests on pectoralis major muscle and 1/3rd on serratus anterior muscle. At its lower medial quadrant, the gland rests on the aponeurosis of the external oblique which separates it from the rectus abdominis, the axillary tail is deep to deep fascia although the breast proper is superficial to axillary fascia, the axillary tail is deep to deep fascia although the breast proper is superficial to axillary fascia,[2] the deep fascia covers pectoralis major muscle, serratus anterior, and chest wall muscle.[3]

The physiological changes occur in three stages:[4]
1. Growth and involution related to age
2. Changes associated with menstrual cycle
3. Changes due to pregnancy and lactation.

A comprehensive classification which puts all the processes of physiological changes growth Development and involution into a single framework called Aberrations of Normal Development and Involution.

Apart from congenital anomalies and inflammatory conditions, the benign breast diseases consist of benign breast tumors such as fibroadenoma, fibrocystic change, sclerosing lesions, and papillary lesions. Epithelial proliferative disease and rarely miscellaneous section.[5]

Virtually, every woman of reproductive age has occasional breast discomfort. Indeed, histological changes in breast tissue can be found in nearly all women of reproductive age.[6]

Epidemiological studies that clarify the etiology of benign breast diseases are few.

Classification of benign breast diseases:[7]
I. Developmental disorders
II. Inflammations
III. Fibrocystic changes
IV. Proliferative breast disease
V. Benign tumors
VI. Others.

Fibroadenomas may present of any age, but the peak incidence is in the 3rd decade.[8]

Whether fibroadenomas are neoplasms or aberrations of lobular development is an unsettled issue.[9] The benign nature of the general class of epithelial tumors of the breast was recognized 100 years ago by Sir Astley Cooper, who called them "chronic mammary tumors."[10]

Muller first found the term "cystosarcoma phyllodes," this tumor is neither cystic nor sarcomatous, and thus the designation should be abandoned in favor of the term "phyllodes tumor"[11] or in the case of malignant transformation, "phyllodes sarcoma." The term phyllodes come from Greek word "phyllon," which means "leaf."

Breast cancer is the most common site-specific cancer in women and is the leading cause of death for women aged 20-59 years. It accounts for 26% of all newly diagnosed cancers in females and is responsible for 15% of the cancer-related deaths in women.[12]

Types of Breast Cancer

Carcinoma in situ

Cancer cells are *in situ* or invasive depending on whether or not they invade through the basement membrane.[13,14] In 1941, Foote and Stewart published a landmark description of lobular carcinoma *in situ*, which distinguished it from ductal carcinoma *in situ*.[14]

Invasive breast cancers have been described as lobular or ductal in origin.[15-18]

The study entitled "evaluation of palpable breast lumps under the age of 35 years with triple assessment" was a prospective study conducted in the Department of Surgery, MIMS Mandya on outpatient and inpatient basis. A total 80 patients with breast lump were included in the study to determine the number of patients having breast cancer. This study was carried out over a period of 1-year from March 2015 to March 2016. Currently, a combination of three tests, i.e., clinical examination, radiological imaging (USG), and FNAC (pathology) together called as triple

assessment is used to accurately diagnose all palpable breast lumps. The triple assessment is taken positive if any of the three components is positive for malignancy and negative only if all of its components are negative for malignancy. Physical examination was in favor of malignant disease in 18 patients. However, histopathology confirmed malignancy in 14 patients only and 4 patients proved to be benign. Similarly, benign diagnosis was made on physical examination in 62 patients. However, histopathology confirmed the benign diagnosis in 66 patients only with the remaining 4 patients being diagnosed as malignant. Thus, histopathology confirmed malignant breast disease in 14 patients. USG was in favor of malignant diagnosis in 16 patients, out of which 14 turned out to be malignant on histopathology.

The sensitivity, specificity, PPV, and NPV of my study are shown in Tables 4-7.

When compared to the other study done in University of Nairobi, "Diagnostic Value of Modified Triple Test for Evaluation of Palpable Discrete Breast Masses In Young Women" the sensitivity, specificity, PPV, and NPV was 100%, 92.3%, 60%, and 100%, respectively, on CBE; 100%, 94.2%, 66.7%, and 100%, respectively, on ultrasound; and 100%, 98.1%, 83.3%, and 100%, respectively, on FNAC. Combinations of CBE and ultrasound and CBE and FNAC had sensitivity, specificity and PPV and NPV of 100%.

Whereas my study shows equal correlation with this study.[19]

Component	Clinical	USG	FNAC	Clinical+USG
Sensitivity	85.7	92.85	100	92.85
Specificity	89.3	92.42	100	92.42
PPV	65	72.2	100	72.2
NPV	3.2	1.6	-	1.6

NPV: Negative predictive value, PPV: Positive predictive value, USG: Ultrasonography, FNAC: Fine-needle aspiration cytology

Yang *et al.* (1996) found a sensitivity, specificity, and PPV for clinical examination as 88%, 92%, 67%, respectively.[20]

Thus, the concordance for histopathology was 96.7%, sensitivity was 100%, and specificity was 96.4%. PPV was 66.7% and NPV was 100%. Pande *et al.* (2003) found that sensitivity, specificity, PPV, and NPV for USG was 95%, 94.10%, 95.50%, 93.75%, respectively (45). Yang *et al.* (1996) found that sensitivity, specificity, and PPV for USG was 97%, and 85%.[20]

Ariga *et al.* (2002) found that FNAC had a sensitivity of 99%, PPV of 99%, and specificity of 99%, respectively (41). Mohammed *et al.* (2005) found that fine-needle aspiration biopsy had a PPV of 100%, sensitivity of 90.6%, and specificity of 100%.[21]

Table 4: Correlation of clinical diagnosis

	HPE	
Clinical	**Malignant**	**Benign**
Malignant	12	7
Benign	2	59

Sensitivity - 85.7%, Specificity - 89.3%, PPV - 65%, NPV - 3.2%, NPV: Negative predictive value, PPV: Positive predictive value, HPE: Helicobacter pylori eradication

Table 5: Correlation of USG with final

	HPE	
USG	**Malignant**	**Benign**
Malignant	13	5
Benign	1	61

Sensitivity - 92.5%, Specificity - 92.4%, PPV - 72%, NPV - 1.6%, NPV: Negative predictive value, PPV: Positive predictive value, USG: Ultrasonography, HPE: Helicobacter pylori eradication

Table 6: Correlation of FNAC with final

	HPE	
FNAC	**Malignant**	**Benign**
Malignant	14	0
Benign	0	66

Sensitivity - 100%, Specificity - 100%, PPV - 100%, PPV: Positive predictive value, HPE: Helicobacter pylori eradication, FNAC: Fine-needle aspiration cytology

Table 7: Combined CBE+USG

	HPE	
USG+clinical	**Malignant**	**Benign**
Malignant	14	5
Benign	0	61

Sensitivity - 92.85%, Specificity - 92.42%, PPV - 72.2%, NPV - 1.6%, NPV: Negative predictive value, PPV: Positive predictive value, USG: Ultrasonography, HPE: Helicobacter pylori eradication, CBE: Clinical breast examination

Ahmad *et al.* (2007) found that the sensitivity of triple test was 100%, and specificity was 100%.[22]

In comparison with the available studies, Manisha *et al.* study on palpable breast lumps with triple assessment our study has values equal to it in benign disease, but the malignant percentage when compared to him is more. His study had a malignancy rate of 5.5% when compared to our study it is 18.75%.[23]

CONCLUSION

Triple assessment is a very useful diagnostic tool to evaluate patients with breast lumps and to detect patients with breast cancers with an overall accuracy of 99.3%. When the lumps are palpable clinically and of size more than 2 cm FNAC itself has a sensitivity of 100%. When the lumps are <2 cm CBE + USG has a sensitivity of 92.8%. It was found that when clinical examination, USG, and FNAC

were all negative for malignancy in a patient with a breast lump, the patient can be safely observed, obviating the need for histology (surgical biopsies). Triple assessment did not require hospitalization, can be performed on OPD basis, without any complications and it is the gold standard diagnostic tool for the palpable breast lumps in early detection of malignancy avoiding biopsies.

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