ORIGINAL ARTICLE

EVALUATION OF BREAST DISEASES BY ASSESSMENT WITH ADVANTAGES OF ULTRASONOGRAM OVER MAMMOGRAPHY

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ABSTRACT: OBJECTIVES: 1. To assess the effectiveness of Triple assessment in evaluation of breast diseases. 2. To compare triple assessment (as a combined diagnostic modality) to each of its components. 3. To find advantages of ultrasonogram over mammography. **METHODS:** Patients attending surgical clinic with breast related complaints during the period from 1st January 2009 to June 31st 2010 were assessed using the Triple test. Each patient was subjected to clinical examination, ultrasonography, mammography, FNAC, and HPE and the results analyzed. **RESULTS:** 40 patients were included in the study, with age ranging from 15 yrs to 60 yrs. The sensitivity, specificity, positive and negative predictive values of clinical examination is 100%, 92%, 88.24%, 100%; FNAC is 8.7%, 100%, 100% 92%; Mammogram is 86.7%, 92%, 86%, 92%; and USG is 66.67%, 100%, 100% 83%, respectively. **CONCLUSION:** In patients with definite lump, clinical examination and FNAC alone may be sufficient to rule out malignancy. USG to the Triple assessment did not add up to the negative predictive value of Triple Test. Mammogram is needed in patients with no clinically palpable lump and to rule out multi-centric and multi-focal disease.
KEYWORDS: Triple assessment Mammogram; USG.

INTRODUCTION: Breast cancer is the most common malignancy in women in western countries. However benign lesions of the breast are far more frequent than malignant ones.

Distinction of benign from malignant is of paramount importance for patients care and proper management.[1] Breast cancer is the leading cause of death from cancer for women of age 40 to 44 years.[2,3]

Donegan stated that most breast cancers appear as palpable masses. Usually found by patients ultrasound, doppler scanning, conventional digital mammography and MRI is established as an essential part of modern multidisciplinary approach for effective investigation and management of breast lump.[4]

Diagnostic mammography is the first imaging study employed to evaluate breast abnormalities.[5]

To promote uniformity and standardization of mammographic interpretation, ACRC American College of Radiography) and other international organisations, have adopted and recommended breast imaging reporting and data system (BIRADS).[6]

FNAC is easily performed and sensitivity ranges from 80-95%.[7] Fake negative results are seen in 4-10% ultrasonography is an important method of defining cystic lesions and demonstrating the echogenic qualities of specific solid abnormalities.[8] Ultrasound in the triple assessment of palpable breast masses can result in a reduction of total costs for the diagnosis and treatment of breast cancers.[9]

Fake negative rate of mammography had been reported to be as high as 16.5%. Multiple studies have shown that the fake negative rate for a combined mammographic and sonographic evaluation varies from 0-26%.[10]

Thus in triple test ultrasonogram over mammography is quiet least invasive and cost effective.[11] Furthermore it can be applied a single stage diagnostic approach, decreasing the deleterious psychological effects on the patients from delay in diagnosis.[12]

The triple assessment for breast diseases involve:

1. Clinical assessment
2. Imaging modalities- ultrasonography mammography, MRI etc.
3. Fine needle aspiration biopsy/cytology.

MATERIALS AND METHODS:

- Patients with lump in the breast or any other breast complaint, surgical clinic during the period from 1st January 2009 to 31st June 2010.
- Females between 15 and 60 years were included in the study.
- Data was obtained from a predesigned profroma.
- Data were analysed by sensitivity, specificity positive and negative predictive values.

RESULTS: The patients attending clinic with breast related complaints and who gave consent for the study were involved. 40 patients were included in the study.

Out of the 40 between the age group 15 years to 60 years, maximum (30%) were between the age group 51-60 and minimum cases of break neoplasm were below the age group of 20 yrs (10%). 85% present with lump in the breast. 12.5% presented with pain and 2.5% presented with discharge per nipple.

Based on clinical diagnosis 37.5% had fibroadenoma, 12.5% fibrocystic disease 7.5% phyllodes tumour, and 42.5% carcinoma.

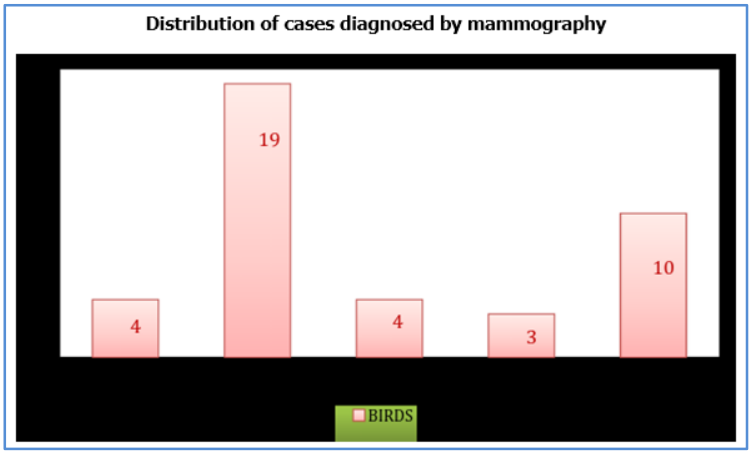
In mammography, 47.5% were BIRADS 2, 7.5% were BIRAD 4. 57.5% were benign, 32.5% were malignant and 10% were inconclusive.

In FNAC, 67.5% were benign, 32.5% were malignant.

In ultra-sonography, 45% were BIRADS 3.0% were BIRADS 1. 75% where benign, 25% were malignant.

Mammographic diagnoses (BI-RADS)	Number of cases	Percentage
1	4	10
2	19	47.5
3	4	10
4	3	7.5
5	10	25
Total	40	100

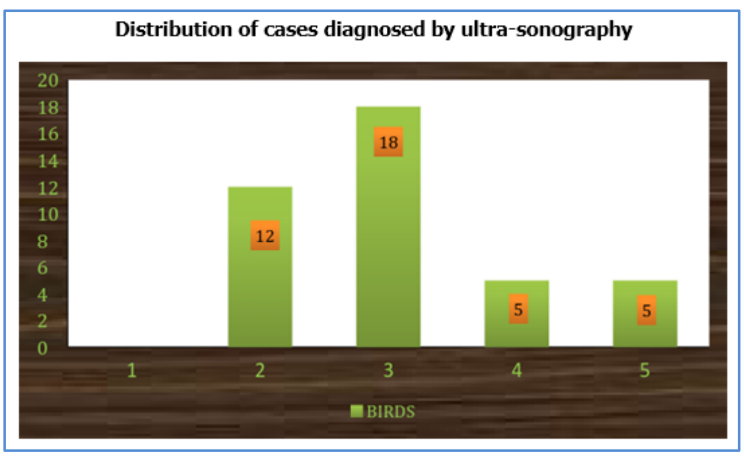
Table 1: Distribution of cases diagnosed by mammography



Graph 1

USG (BI-RADS)	Number of cases	Percentage
1	0	0
2	12	30
3	18	45
4	5	12.5
5	5	12.5
Total	**40**	**100**

Table 2: Distribution of cases diagnosed by ultra-sonography

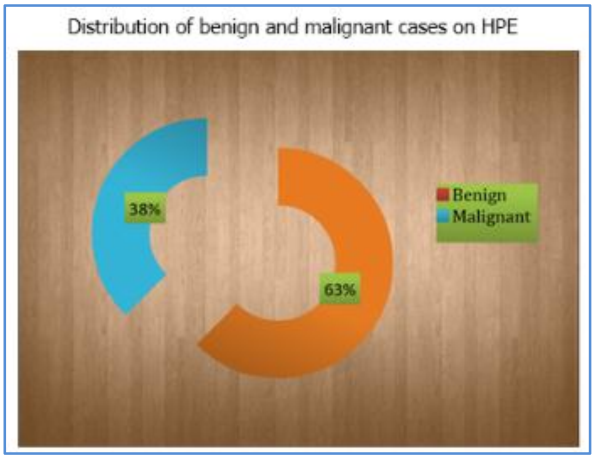


Graph 2

Lesions	Number of cases	Percentage
Benign	25	62.5

Malignant	15	37.5
Total	**40**	**100**

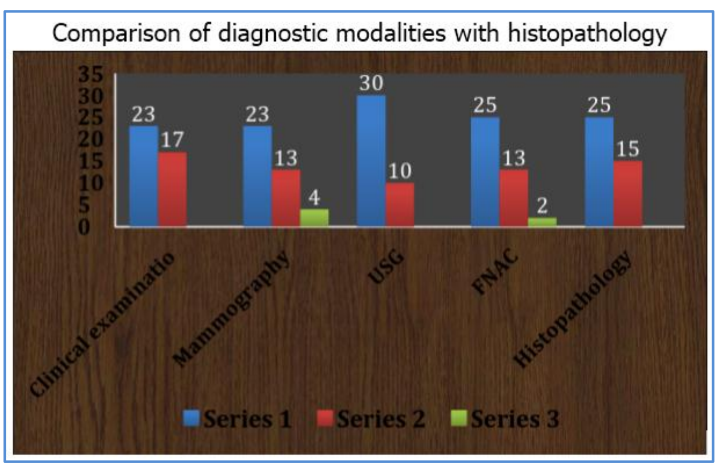
Table 3: Distribution of benign and malignant cases on histopathology



Graph 3

Diagnostic modalities	Benign	Malignant	Inconclusive	Total
Clinical examination	23	17	-	40
Mammography	23	13	4	40
USG	30	10	-	40
FNAC	25	13	2	40
Histopathology	25	15	-	40

Table 4: Comparison of diagnostic modalities with histopathology



Graph 4

Clinical Diagnosis	Histopathological diagnosis		Total
	Benign	Malignant	
Benign	23	-	23
Malignant	2	15	17
Total	**25**	**15**	**40**

Table 5: Comparison of clinical diagnosis with histopathology

(P=0.000).
Sensitivity: 100%.
Specificity: 92%.
Positive Predictive value: 88.2%.
Negative Predictive Value: 100%.

Mammographic Diagnosis	Histopathological Diagnosis		Total
	Benign	Malignant	
Benign	23	2	25
Malignant	2	13	15
Total	**25**	**15**	**40**

Table 6: Comparison of mammographic diagnosis with histopathology

(P=0.000).
Sensitivity: 86.67%.
Specificity: 92%.
Positive Predictive value: 86%.
Negative Predictive Value: 92%.

USG Diagnosis	Histopathological Diagnosis		Total
	Benign	Malignant	
Benign	25	5	30
Malignant	-	10	10
Total	**25**	**15**	**40**

Table 7: Comparison of USG diagnosis with histopathology

(P=0.005).
Sensitivity: 66.67%.
Specificity: 100%.
Positive Predictive value: 100%.
Negative Predictive Value: 83%.

FNAC Diagnosis	Histopathological Diagnosis		Total
	Benign	**Malignant**	
Benign	25	2	27
Malignant	-	13	13
Total	**25**	**15**	**40**

Table 8: Comparison of FNAC diagnosis with histopathology

(P=0.000).

Sensitivity: 86.67%.

Specificity: 100%.

Positive Predictive value: 100%.

Negative Predictive Value: 92%.

Based on histopathology 42.5% were fibroadenoma, 7.5% were Benign phyllodes, 12.5% were fibrocyctic disease, 2.5% were DCIS, 35% were invasive carcinoma 62.5% were benign, 37.5% were malignant.

Sensitivity of histopathology test was 100% and specificity 92% with a positive predictive value of 88.2% and negative predictive value of 100%.

In a comparative diagnosis between mammography and histopathology, mammography should 86.67% sensitivity, 92% specificity with a positive predictive value of 86% and negative predictive value of 92%.

In a comparative diagnosis between USG and histopathology, USG should 66.67% sensitivity and 100% specificity with a positive predictive value of 100% and negative predictive value of 83%.

In a comparative diagnosis between FNAC and histopathology, FNAC showed 86.67% sensitivity 100% specificity with a positive predictive value of100% and negative predictive value of 92%.

DISCUSSION: When a patient with a lump in breast, clinical examination and FNAC alone can distinguish benign from malignant lesions. Thus the accuracy of clinical examination and FNAC alone reaches up to 100% without need of mammogram.

Incorporation of mammography just adds up to the diagnosis when patient has a lump that is clinically palpable and to rule out multicentric/multi-focal disease

USG in the triple assessment does not add to the diagnosis but ultrasound becomes a very important tool when a situation arises where mammogram could not differentiate a solid tumor from a cyst. USG over mammogram as the improved techniques approaches the specificity and positive predicitive value by 100% in the prevent study.

In a study done by Ahmed 1 et al[13] the study showed when triple test is concordant the study showed that when triple test is concordant, final treatment may be ensured without open biopsy. In non-concordant cases, FNAC stands as single most important investigation.

In Reinikanien et al[14] they have found sensitivity and specificity of FNAC to be 92% and 83% respectively where as in the prevent study they are 87% and 100%.

In a study done by Philip J Drew et al[15] sensitivity of each modality: clinical examination 84% mammography 87.6%, fine needle aspiration cytology 79% and specificity: clinical examination 83.1%, ultrasound 88.9%, mammography 86.4%, fine needle aspiration cytology 97%. The results of this study were similar to the results of the prevent study.

Al-Muhim et al[16] in a study to assess accuracy of the "triple test" in the diagnosis of palpable breast masses in Saudi females, concluded that the triple test was 100% accurate in the diagnosis of palpable breast lesions when all there elements were concordant.

A solid lesion requires a firm diagnosis. A positive result on cytology after aspiration is sufficiently accurate to justify one stage diagnosis and treatment.

A negative or suspicious finding on FNAC is inconclusive and a radiological investigation is required. In such instances methods like "Triple test" increase the accuracy of diagnosis, at least from an unnecessary surgical procedure.

CONCLUSION:

- Triple test is a very useful tool in evaluating the breast diseases.
- In patients with definite lump, clinical examination and FNAC alone may be sufficient to rule out malignancy and this may be cost- effective by avoiding a mammogram.
- Mammogram is needed in patients with no clinically palpable lump and rule out multi-Centris and multi focal disease.
- USG in the triple test did not add up to the negative predictive value of triple test. But USG may be used instead of mammogram to avoid the radiation due to mammogram.

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FIG. 1

FIG. 2

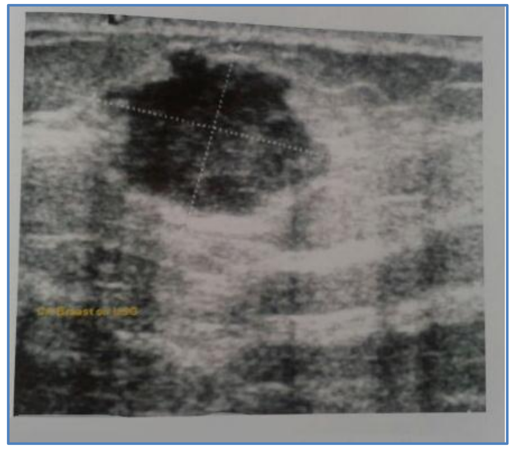

FIG. 3

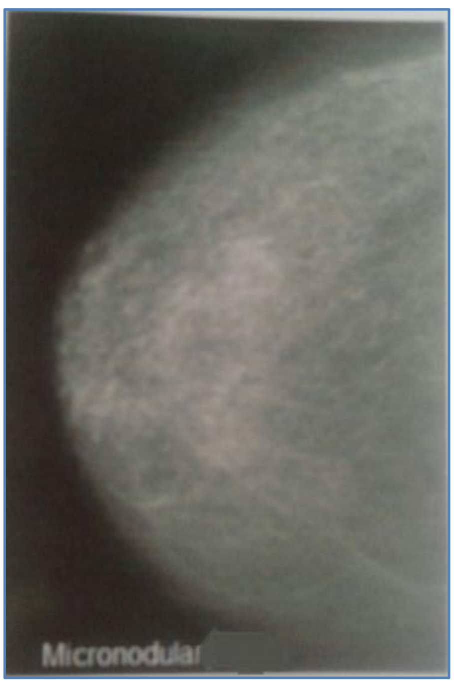

FIG. 4

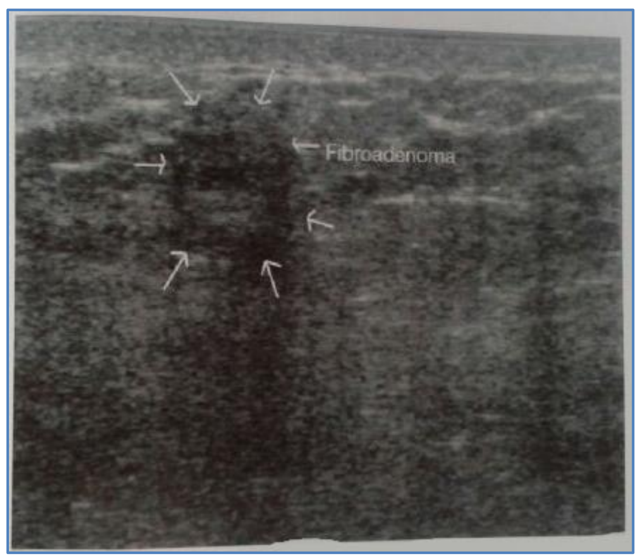

FIG. 5

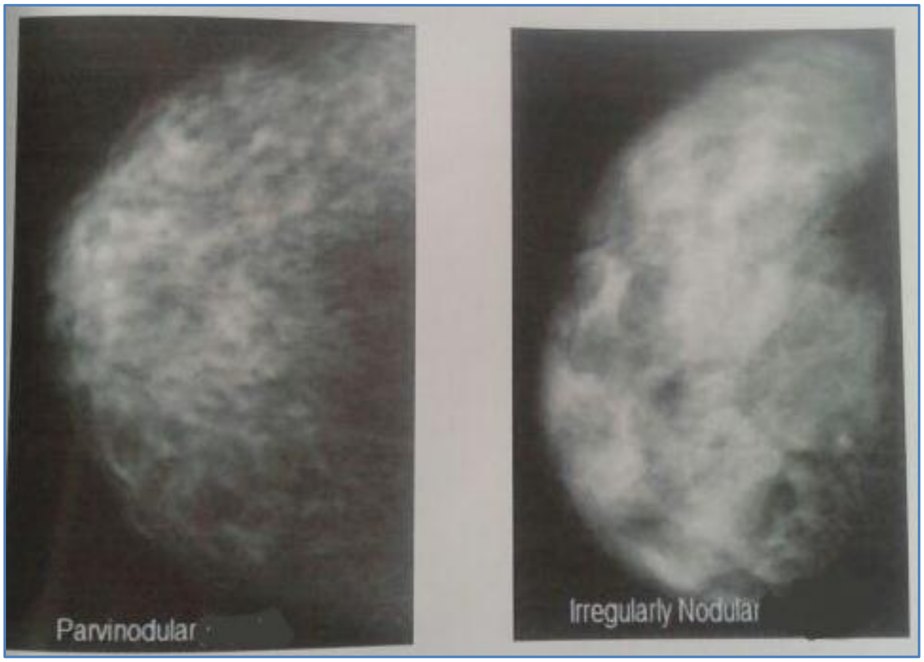

FIG. 6

FIG. 7

FIG. 8

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