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Original Research Article

A prospective study to determine the accuracy of triple test score in breast lump

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ABSTRACT

Background: Breast cancer is the most common cancer in women worldwide. The commonest mode of presentation of diseases of the breast is lump. It is the most common site-specific cancer in women. Triple test score which includes clinical breast examination, mammogram, FNAC score. A simple non-invasive but reliable test can make a huge difference in management between benign and malignant lumps. Aims and objectives of the study were to differentiate between benign and malignant lesions based on TTS and correlated the accuracy of triple test score with histopathology report, and plan the management accordingly.
Methods: A prospective study was carried out in which TTS was calculated by summation of individuals' scores of all three components and compare with histopathology report.
Results: In present study of 74 patients (age group of 30 to 65 years), based on TT score 52 benign, 12 malignant, and 10 suspicious (neither benign nor malignant). But the final histopathological result showed 59 as benign and 15 as malignant, which is in concordant with TTS, which shows the accuracy of up to 100%. Out of 10 (suspicious) which were dis-concordant, 7 are benign and 3 are malignant on histopathology.
Conclusions: By use of the triple test score and its interpretation, definitive treatment can be initiated, which would reduce the need for unnecessary biopsy and its ability to predict benign lump, can avoid major surgery.

Keywords: Breast lump, FNAC, Mammogram, Triple test score

INTRODUCTION

Breast cancer is the most common site-specific cancer in women and is one of the leading causes of death from cancer for women, accounting for about 20% of cancer-related deaths in women.[1,2] Breasts are the most important feature of female anatomy and an integral part of the reproductive system. They are symbols of womanhood and fertility. Thus, every woman with a breast mass, breast pain, or discharge from nipple fears that she has breast cancer. The majority of them prove to be benign, but the probability of the diagnosis of cancer is never zero. So careful evaluation, exact diagnosis, and definite treatment is mandatory in any breast mass.

Breast masses are common clinical presentations in breast clinics, have a variety of etiologies, benign or malignant, their outcome and prognosis depend on early diagnosis and prompt treatment.[3] The diagnostic approach of palpable breast lumps should involve the use of rapid, less expensive, most accurate and least invasive methods to evaluate and distinguish between benign and malignant lumps in out-patient clinics, such methods would benefit both patients and surgeons by promoting proper preoperative diagnosis and management and further limits unnecessary testing and procedures.[4-6] Breast mass is a common complaint along with pain. Such symptomatic masses have been traditionally assessed by clinical, cytological, and radiologic modalities like mammography. While open biopsy

provides more data, it results in undesirable cosmetic problems. Thus, up to 95% of such lesions are diagnosed by the triple assessment. Although the role of Fine needle aspiration cytology and clinical examination has been unanimous, The sensitivity of mammography has been proven, additional diagnostic procedures often become necessary because of its low specificity. Despite the individual appreciable false negative rates associated with these modalities, the combination of these diagnostic modalities has improved sensitivity approaching invasive methods like open biopsy, thus avoiding some unnecessary 'scars', stress and workload.

In TTS lump- with score 4 points or lower are benign and managed accordingly lump with score 6 points or higher are malignant and should undergo definitive therapy, only those lump with score 5 require biopsy for confirmation for diagnosis. Thus a large number of unnecessary biopsies can be avoided, saving the patient undue anxiety, uncertainty in receiving appropriate treatment.

METHODS

A prospective study included females of the age group 30 to 65 years selected randomly, having a breast mass (in one or both the breasts), who attended the OPD or had been admitted in the department of surgery, Swaroop Rani Nehru Hospital, Allahabad, during the period of September 2018 to October 2019.

Exclusion criteria

Previously diagnosed malignancy of the same breast, obvious, advanced malignancy of breast, radiation therapy given to the breast, acute inflammatory conditions of the breast and male patients with breast mass were excluded from the study.

Triple test score (TTS) was calculated by summation of the individual scores of all the three components of the triple test. Each component was graded by a score of 1, 2, or 3 as per the findings. Each patient was assessed independently by an expert in the use of respective modality. An individual score was appointed based on the findings in the respective test.

Table 1: Scores on the basis of benign, suspicious and malignant features.

Finding	Score
Completely benign	1
Suspicious	2
Malignant	3

Physical examination

Score 1- A soft or firm, freely mobile lump, score 2- Lump with doubtful finding in-between scores 1 and 3, score 3- A hard, immobile lump with definite fixity to breast tissue.

Figure 1: Physical examination of the breast lump.

On X-ray mammogram

Birads category 2 (definitive benign finding), Birads category 3- Finding that have a high probability of being benign (>98%), Birads category 4- Reasonable probability of being malignant (3% to 94%), Birads category 5- High probability of being malignant (≥95%).

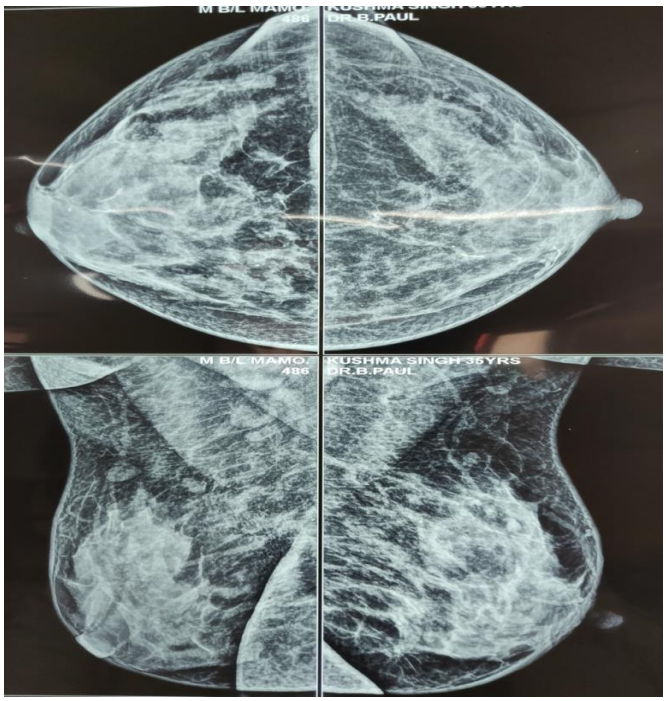

Figure 2: mammogram of breast.

On FNAC

Score 1 if a lump with benign report, Score 2 was an ambiguous or suspicious for malignant cells report and Score 3 was for a positive for malignant cells report.

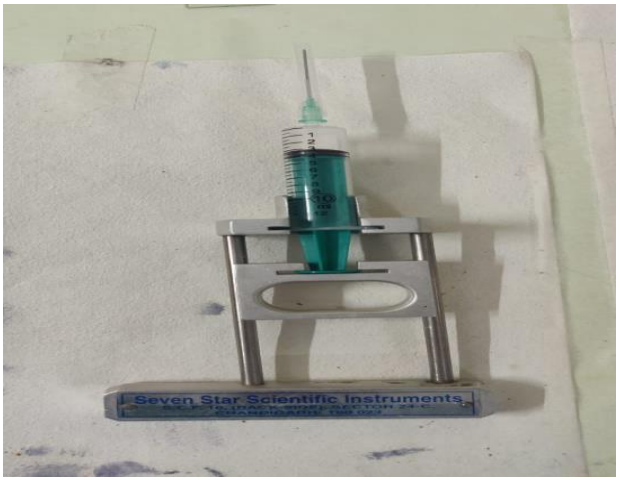

Figure 3: FNAC syringe.

The respective scores were combined to calculate the TTS for each patient. A combined score of 6 or above was considered as malignancy and manage accordingly, combined score of 5 was considered as equivocal and all patients were subjected to excisional biopsy to compare diagnosis, combined score of 4 or less was considered as benign and excision biopsy was done with patient consent.

All patients were subjected to excisional biopsy with consent for this study. A biopsy report is correlated with the TTS.

RESULTS

The study included 74 patients, having a complaint of breast lump, who attended the OPD or were admitted to the department of surgery in Swaroop Rani Nehru Hospital, Allahabad. Accordingly, out of the 74 patients included in the study it was found that 23 (31.08%) patients were in the age group of 30 to 35 years. 24 (32.43%) patients were in the age group 36 to 40 years. 17 (22.98%) patients were in the age group 41 to 45 years. 7 patients (9.46%) 46 to 50 years and 3 patients (4.05%) in the age group for more than 50 years.

Table 2: Age distribution.

Age in years	No. of cases	Percentage
30 to 35	23	31.08
36 to 40	24	32.43
41 to 45	17	22.98
46 to 50	7	9.46
>50	3	4.05
Total	74	100

A maximum of 30 patients (40.54%) had their symptoms for a duration of 1 to 2 months. 24 patients (32.44%) had the symptoms for 3 to 4 months. 10 patients (13.51%) had the symptoms for 5 to 6 months.10 patients (13.51%) had symptoms for more than 6 months.

Table 3: Duration of symptoms.

Duration (months)	Number	Percentage
1-2	30	40.54
3-4	24	32.44
5-6	10	13.51
>6	10	13.51
Total	74	100

In the present study, the left breast was involved in 44 (59.46%) patients and the right breast was involved in 30 patients (40.54%).

Table 4: Distribution according to side of affected breast.

Side	Number	Percentage
Left side	44	59.46
Right side	30	40.54
Total	74	100

The most common site of the tumor in the breast was the upper outer quadrant of the breast. Out of 74, 30 patients (40.54%) had a mass in the upper outer quadrant of the breast. 24 patients (32.44%) had the mass in the upper inner quadrant of the breast. 12 patients (16.22%) had a mass in the lower outer quadrant and 6 patients (8.10%) had mass in the lower inner quadrant. Central quadrant mass was present in 2 patients (2.70%).

Table 5: Distribution according to the site of the mass.

Quadrant of the breast	No. of cases	Percentage
Upper outer quadrant	30	40.54
Upper inner quadrant	24	32.44
Lower outer quadrant	12	16.22
Lower inner quadrant	6	8.10
Central	2	2.70
Total	66	100

In the present study, the size of the mass was assessed by palpation and measured properly. The maximum diameter of the mass was assessed in different planes. The Average size of the mass was less than 5 cm in most of the patients. Out of 74 patients 73 patients (98.65%) had a mass of size less than 5 cm. Only 1 patient had size more than 5 cm.

Table 6: Size of the mass.

Size of mass (cm)	No. of patients	Percentage
<5	73	98.65
>5	1	1.35
Total	74	100

In the present study, all patients were subjected to histopathological examination after taking consent. On Histopathological examination, 59 (79.73%) of the

masses were diagnosed as benign. The most common finding was found to be a benign fibroadenoma. The next most common finding was consistent with fibrocystic disease of the breast. Out of 74 biopsies, 15 (20.27%) patients were diagnosed as malignancy of the breast.

Table 7: Histological types of masses on histopathology.

Type	No. of patients	Percentage
Benign	59	79.73
Malignant	15	20.27
Total	74	100

Finally triple test score results were confirmed with histopathology 12 (16.21%) lesions were malignant on TTS and all were confirmed malignant on histopathology. 52 (70.27%) lesions were benign on TTS out of which all 52 were confirmed benign on histopathology. 10 (13.51%) lesions were suspicious on TTS out which 3 were malignant on histopathology and 7 benign. The sensitivity, specificity, positive predictive value, negative predictive value of TTS to diagnose malignant lesion was 100%.

Table 8: Correlation between TTS and histopathology.

	TTS		Histopathology	
	No.	**Percentage**	**Malignant**	**Benign**
Malignant	12	16.21	12	0
Benign	52	70.28	0	52
Suspicious	10	13.51	3	7
Total	74	100	15	59

A total of 74 breast masses were evaluated in women. TTS was calculated and biopsy was done. 52 patients (70.27%) had a TTS of 4 or less points (concordant benign). All these masses were benign on open biopsy. 10 masses (13.51%) had TTS of 5 points (non-concordant). All underwent biopsy analysis, and 3 were proved to be malignant. 12 (16.21%) masses had TTS ≥6 points (concordant malignant) and all 11 were malignant on biopsy.

All masses scoring 5 points were evaluated further with excisional biopsy. The results of the biopsy on histopathology examination were considered as the final diagnosis.

Thus, out of 10 patients scoring 5 points on TTS, 3 was diagnosed as malignant and treated accordingly. The use of TTS for assessment of palpable breast masses in young females, can help avoid open biopsy in the majority of patients.

Table 9: Concordant results compared to histopathology report.

TTS	No. of patients	Histopathology	
		Benign	**Malignant**
Concordant benign	52	52	0
Concordant malignant	12	0	12
Non-concordant	10	7	3
TOTAL	74	59	15

DISCUSSION

Breast cancer is the most common site-specific cancer in women and is one of the leading causes of death from cancer for women, accounting for about 20% of cancer-related deaths in women. The commonest mode of presentation of diseases of the breast is “lump”. A palpable mass in a woman’s breast could be a benign or malignant lesion and it requires a prompt evaluation. Correct preoperative diagnosis of a breast lesion is essential for optimal treatment planning. The primary aim is to confirm or exclude cancer. A single-modality test is not accurate enough to make the correct diagnosis for a breast lesion.

The present study tries to evaluate the accuracy of multimodality tests, that is, clinical breast examination, mammogram, and fine needle aspiration cytology together, keeping Histopathology of breast lump(s) as the reference standard. In the present series, among 74 patients, in 30 (40.54%) patients a lump was detected in the upper outer quadrant of the breast, followed by 24 (32.44%) in the upper inner quadrant and the remaining 20 (27.02%) in other quadrants of the breast. Similar observations were made by Khemka et al and Hussain et al, in whose studies the majority of breast lumps were found in the upper outer quadrant. The relative higher occurrence of a breast lump in the upper outer quadrant of the breast compared to the other quadrants is because much of the epithelial tissue of the breast is present in this quadrant.

Present study, review of studies showed that triple assessment is consistently more sensitive than any single test alone, capable of picking up 95% to 100% of cancers when at least one component is positive. When all three components of the triple test are concordant, the diagnostic accuracy is 100%. This obviates the need for open biopsy and patients could directly undergo definitive treatment.

Table 10: Comparison of concordant cases with other studies.

	TTS results	No. of cases	HPE results	
			Benign	Malignant
Present study	Concordant benign	52	52	0
	Concordant malignant	12	0	12
Gaikwad et al[7]	Concordant benign	88	88	0
	Concordant malignant	27	0	27
Morris et al[8]	Concordant benign	152	152	0
	Concordant malignant	88	0	88
Ghimire et al[9]	Concordant benign	20	20	0
	Concordant malignant	29	0	29
Katti et al[10]	Concordant benign	55	55	0
	Concordant malignant	44	0	44

CONCLUSION

In present study patients having breast mass, we came to the following conclusions:

Triple test assessment was a breakthrough in the direction of management of palpable breast lump but if it is discordant among the component of the triple test then what should be next step in the management plan is questioned to be answered there is where triple test score showed us the path. To make diagnosis a breast lump, the triple test score is easy to use, minimally invasive, reliable, and very cheap diagnostic tool with accuracy up to 100%. By use of triple test score and its interpretation, definitive treatment can be initiated which would reduce the need for unnecessary biopsy and its ability to predict benign lump thus avoid major surgery.

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