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Original Research

FNAC in diagnosis of breast lump- A Prospective Study

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ABSTRACT:
Background- A lump in the breast results in anxiety for the patient and her family whether it may be benign or malignant. Carcinoma of the breast is the most common non-skin malignancy in women and is second only to lung cancer as a cause of cancer deaths. The development in patient education and screening programs have permitted a marked increase in the number of tumours detection, thereby increasing the use of FNAC procedures. **Objective** - To assess the success rate, sensitivity and specificity of FNAC in the diagnosis of breast lump. Material and Method- A hospital based prospective study and was carried out in the Department of Surgery in collaboration with the Department of Pathology at MAMC Agroha, Hisar. A total of thirty cases of breast lump presenting to the Surgery OPD were included in the study by simple random sampling. **Results** - All thirty cases of breast lump were from female patients. Age of the patients ranged between 28 and 67 years. Both right and left side were equally involved. Out of a total of thirty cases, 5 were diagnosed as benign on FNAC of which 4 were confirmed as benign histologically further and one was diagnosed as malignant. The remaining 25 cases were diagnosed as malignant on FNAC Hence there were a total of 5 benign cases and 25 malignant cases. FNAC showed sensitivity of 96% and a specificity of 80%. **Conclusion** - FNAC is a well-accepted procedure in developing countries due to its low cost, safe and affordable with rapid results, pain is minimal. Whenever there is discrepancy between clinical findings, imaging studies, FNAC can be used as the next step in assessment before definitive treatment.
Key words: breast lump, FNAC, malignancy.

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INTRODUCTION

With growing awareness in the general population, especially about breast pathologies, a lady with a breast lump is one of the commonest presentations in outpatient departments. Clinical examination would be followed in most patients with a confirmatory diagnosis under the microscope.[1] Pathological diagnosis of the breast lump is established using fine needle aspiration cytology (FNAC), core needle biopsy or excision biopsy.[2] The development in patient education and screening programmes have permitted a marked increase in the number of tumours detected, thereby increasing the use of FNAC procedures.[3] FNAC is a simple and fast procedure but highly operator dependent requiring special training on the part of the pathologist.[4] Also, in case of ultrasound detected breast nodules, FNAC is a well established method for the diagnosis of breast lesions. It has the advantages of being highly accurate in experienced hands, cost effective, and useful for small lesions not eligible for core needle biopsy.[5]

The aim of the present study was to assess the success rate, sensitivity and specificity of FNAC in the diagnosis of breast lump.

MATERIALS AND METHOD-

Present study was a hospital based prospective study and was carried out in the Department of Surgery in collaboration with the Department of Pathology at MAMC Agroha, Hisar. A total of thirty cases of breast lump presenting to the Surgery OPD were included in the study by simple random sampling. 30 females who were above the age of 20 and had clinically palpable breast lump and gave their consent for the study were included. Females above 20 years of age with no clinically palpable breast lump and were not willing to give their consent for the study were excluded. A complete clinical profile of the patient including age, duration, size and site of lump, marital status and menstrual history was recorded. For FNAC equipments required: 10 ml disposable plastic syringe, 22 gauge disposable needles, 95% methanol, Coplin jar, 30 Spirit swabs, Glass slides. Under completely aseptic precautions, skin overlying the breast lump was cleaned using spirit swabs. A 10 ml disposable syringe along with 22 gauge disposable needle was introduced into the breast lump. Material was withdrawn by aspiration and spread on glass slides. Slides were fixed in 95% methanol in a coplin jar, prepared, stained with H& E and field's stain and examined under microscope for cytology.

STATISTICAL ANALYSIS:

The data was entered in Microsoft excel spreadsheet for analysis. The analysis was done using SPSS (Statistical Package for Social Sciences) version 20.0. Analysis of variance was used to assess relationship between the two variables. Student t-test and Fischer test was used to compare the categorical values.

OBSERVATION AND RESULTS

AGE (IN YEARS)	NO. OF CASES	PERCENTAGE (%)
28 -37	5	16.67
38-47	8	26.67
48-57	7	23.33
58-67	10	33.33
Total	30	100

Table 1- Distribution of cases according to age

Size of lump (area in $cm^{2)}$	No. of patients	Percentage
6-15	6	20
16-25	18	60
26-35	2	6.67
36-45	2	6.67
46-55	-	0
56-65	2	6.67
Total	30	100

Table 2- Distribution of breast lumps according to size of lesion

In total of 30 cases 6 patients had size of lump less than 15 cm^2 ,18 patients had size of 16-25 cm^2 , largest noted size was 56-65 square centimeters in 2 patients.

In total of 30 patients in whom FNAC was conducted 25 were found to be malignant and 5 were benign.

TEST RESULT (FNAC)	DISEASED (MALIGNANT)	NON DISEASED (BENIGN	TOTAL
Positive	24	1	25
Negative	1	4	5
Total	25	5	30

Table 3- The Predictive Value of FNAC For Breast Lump Sensitivity = True Positive/ True Positive + False negative

Sensitivity = 96%

Specificity = True Negative / true negative+ false positive Specificity = 80%

FNA		N	Mean	Std. Mean	Std. Error Mean
Size S	1	25	23.93	13.84504	2.76901
	2	5	9.4	5.81378	2.6000
Age	1	25	49.64	11.590	2.318
	2	5	52.00	7.583	3.391
Size L	1	25	3.06	.45448	.09090
	2	5	2.1009	.58288	.260266

Table 4 - Statistical Group T-test among the variables : size and age diagnosis with FNAC

DISCUSSION

The FNAC is a known non operative procedure used for diagnosis of breast lesions. It is a well established method which allows rapid diagnosis and is a cost effective outpatient procedure. However, FNAC has got many pitfalls as results depend on the representative aspirate, the quantity of the aspirate obtained and also on the experience of the reporting pathologist.[6]

In the present study majority of the females with malignant breast lump were in the age group 58 – 67 years, while those with benign lumps were in the age group 28 – 47 years. In the study done by Tonape et al[7] the incidence of benign breast diseases was the highest in the age group of 21 to 30 years. In a similar study conducted by Das et al[8], in which 45% of the cases belonged to the age group of 21 to 30 years. In our study this feature was incongruent due in part to the small sample size.

Mean age in our study was 50 years. In the study by Rahman et al[9] the population ranged from 14-86 years with a mean age of 33.6 years. Ahmed et al[10] from Sudan reported 15-85 years of age range with a mean of 37 years. Kumar et al[11] reported 6-72 years and Tiwari et al[12] 17-56 years in Nepal with a mean age of 34 and 32 years respectively and 18-92 years with a mean age of 59.3 years were 57 reported by Dennison et al[13] in the United Kingdom. The higher age range of this study as compared from Nepal may be explained by the increased life expectancy rates in the UK than those countries. Again the lower age range from the study of the UK is also may be due to lower life expectancy rate of Bangladesh compared to the UK.

In our study out of a total of thirty cases, 5 were diagnosed as benign on FNAC of which 4 were confirmed as benign on histopathology and one was diagnosed as malignant. The remaining 25 cases were diagnosed as malignant FNAC out of which one was benign on histopathology and the remaining 24 malignant. Hence there were a total of 5 benign cases and 25 malignant cases. The sensitivity and positive predictive value for FNAC were both 96% while the specificity and negative predictive value for FNAC were 80% each. The diagnostic accuracy or the success rate of FNAC for diagnosing benign lesions was 80%, whereas that for malignant lesions was 96%. The sensitivity, specificity, positive predictive value, negative predictive value, diagnostic accuracy and success rate were 100% each for histopathology.

The sensitivity of FNAC for detecting breast lesions was very high according to the study by Venugopal et al[14] for benign lesions it was 94.59%, 90.47% for malignant lesions and 100% for inflammatory lesions. An attempt to correlate the results of cytology and histopathology showed that FNAC is equally specific in the diagnosis of breast lesions especially malignancy. The Specificity for benign lesion was 93.1% and 95.55% for malignancy. This study reaffirmed that FNAC is a very effective adjunct to the clinical evaluation of breast lesions and has a definitive role in the diagnosis and early treatment of palpable breast lumps.

Study done by Gobbi et al[15] has shown that FNAC and Core Needle Biopsy (CNB) do equally well in negative predictive value and false negative rate. Although characteristics of the lesion and sampling errors may have contributed to the false- negative diagnoses seen with FNAC. Sampling errors were the only cause of false- negative diagnoses with CNB. For lesions smaller than 1cm, FNAC, CNB, and combined biopsy were equivalent in diagnostic accuracy. For 22 lesions smaller than 1 cm, 19 were non palpable. The rate of sampling errors using FNAC and CNB for non palpable lesions smaller than 1 cm can be attributed to a deeper localization of the lesions. As reported by other authors, it was realized that with FNAC the lesions are easier to sample because of the multidirectional passes and tactile sensitivity compared to CNB. The operator can feel the needle penetrate the lesion with FNAC but not during CNB. However, for lesions smaller than 1 cm FNAC was equal to CNB. Combined biopsy failed to increase the diagnostic accuracy. For the lesions between 1 and 2 cm FNAC and CNB were equal in diagnostic accuracy. Westened et al[16] showed that combined biopsy results in an increase in absolute sensitivity compared to FNAC alone and an increase in absolute and complete sensitivity and a decrease in inadequacy rate compared to CNB alone. For lesions between 2 and 5 cm the results of CNB are better than FNAC. For those lesions, the combined biopsy showed

better results than FNAC or CNB alone. For lesions greater than 5cm, FNAC and CNB were equivalent for all parameters. The combined biopsy only showed higher absolute sensitivity when compared with FNAC alone. We can realize that it is easier to perform FNAC and CNB in big lesions. There is a lower risk of missing the target. The main reason for a false negative and inadequate material depends on the characteristics of the lesion and may occur by aspiration of surrounded thick inflammatory or desmoplastic reaction. When FNAC is performed in tumors greater than 5 cm with large areas of necrosis the smears contain blood and are devoid of cells. For this reason, combined biopsy can result in a decrease in the inadequacy rate when compared with the results of FNAC and Core Needle Biopsy evaluated separately.

There are some difficulties and limitations that need to be mentioned about FNAC. Both false-negative and false-positive results can occur. The most significant difficulty in making a diagnosis is the overlapping features of different lesions. Dysplasia also has a role in the false negative results. Small size of the tumour cells in certain histological types may contribute to false negative results. Fine Needle Aspiration Cytology has been said to be able to give a definitive one stop assessment of a breast lump in about 90% of cases. In cases where after a repeat sampling, one still gets acellular aspiration or suspicious/atypical cells, then a core needle biopsy is advised which in most instances will resolve the problem.[17]

CONCLUSION

FNAC is a well-accepted procedure in developing countries due to its low cost, safe and affordable with rapid results, pain is minimal and no further care is needed. This requires an excellent aspirator to obtain satisfactory material and breast cytopathologic expertise in interpreting breast aspirates. Many studies confirmed the usefulness of a systematic use of core biopsy for diagnosis of breast cancer, even when good quality clinical, radiological, and histological examinations together are undertaken.

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