

Research Article**Efficacy and reliability of FNAC in cases of Palpable Breast Lumps****¹Fatima Rehman,²Nayab Amir****and ³Saima Nasir**¹Ex-House Officer, Lahore General Hospital, Lahore²Demonstrator, Department of Pharmacology
Avicenna medical college Lahore³Woman Medical Officer, RHC MidhRanjha Sargodha**ABSTRACT:**

Objective: To evaluate the diagnostic accuracy of fine needle aspiration cytology in patients with breast lump using histopathology as gold standard.

Material and methods: This cross sectional study was conducted at Department of Surgery, Lahore General Hospital, Lahore from September 2016 to March 2017. Total 200 patients with lump in breast were included in the study.

Results: Total 200 patients with breast lump were included in this study. Mean age of the patients was 35.45 ± 8.57 . All the patients were divided into different age groups. Ninety (45%) patients were in age group 20-30 years, 47 (23.5%) in age group 31-40 years, 32 (16%) were in age group 41-50 years, 29 (14.5%) were in age group 51-60 years and 2 (1%) patients were in age group >60 years. Gender distribution was done and found 7 (3.5%) male patients and 193 (96.5%) female patients. Histopathological diagnosis of breast lesions show 53 (26.5%) malignant and 147 (73.5%) benign cases. Table 3 shows result of FNAC taking histopathology as gold standard. True positive (TP) were recorded as 49 (24.5%), 16 (8%) false positive (FP), 8 (4%) false negative (FN) and 127 (63.5%) as true negative (TN), sensitivity was 85.96 %, specificity was 88.81 %, positive predictive value (PPV) was 75.38% and negative predictive value (NPV) was 94.07%.

Conclusion: The evaluation of diagnostic accuracy of fine needle aspiration cytology in a breast lump using histopathology as gold standard shows a greater sensitivity and specificity, less invasive and cost effective procedure for the diagnosis.

Keywords: Breast lump, diagnostic accuracy, fine needle aspiration cytology

INTRODUCTION

Breast cancer is the most common cancer in women both in the developed and developing countries of the world. It is the leading cause of death in developing countries. In 2012, it was diagnosed 1.7 millions of cases worldwide and half of cases and deaths occur in developing countries. Breast lumps are one of the most prevalent presenting complaints in an outpatient department (OPD) in Pakistan. Most of the cases are benign (about 90%) and have no serious consequences, but malignancy contributes a significant percentage of palpable lumps¹. Early diagnosis of breast abnormalities are associated

with improved outcome. A confident diagnosis can be established in more than 95% of cases utilizing triple assessment (examination, imaging and histological studies). Fine needle aspiration cytology appears currently to have most valuable test for palpable breast lesion and essential part of triple assessment. Fine needle aspiration cytology (FNAC) is a relatively simple, reliable, and economical and less complicated technique for the evaluation of mass lesions². It can be easily repeated if an adequate sample is not obtained. It is documented in different studies that FNAC

have 80% to 98% sensitivity and more than 99% specificity³.

This study was conducted to determine the sensitivity and specificity of fine needle aspiration cytology (FNAC), by comparing the results with histopathology.

MATERIAL AND METHODS

Total 200 patients from September 2016 to March 2017 presented at OPD with lump in breast diagnosed clinically, age from 20 to 60 years either male or female were included in this study. Patients with cellulites of breast, breast abscess and breast cysts were excluded from the study. An informed consent was taken from every patient. After taking the history and examination fine needle aspiration cytology was performed under aseptic conditions by principle investigators having 3 years experience. Smear was sent to laboratory for cytology. Excision biopsy was done for small tumors or lump found benign on fine needle aspiration cytology and histopathology of mastectomy. Specimen will be included as tissue diagnosis. All the relevant information was filled on Performa.

All the data was entered in SPSS version 16 and analyzed. Mean ± S.D. was presented for age of the patients. Frequencies and percentages were

presented for gender distribution. A 2x2 table was used to determine the sensitivity, specificity, accuracy, positive and negative predictive value for fine needle aspiration cytology taking histopathology as gold standard.

RESULTS

Total 200 patients with breast lump were included in this study. Mean age of the patients was 35.45±8.57. All the patients were divided into different age groups. Ninety (45%) patients were in age group 20-30 years, 47 (23.5%) in age group 31-40 years, 32 (16%) were in age group 41-50 years, 29 (14.5%) were in age group 51-60 years and 2 (1%) patients were in age group >60 years. Gender distribution was done and found 7 (3.5%) male patients and 193 (96.5%) female patients. Histopathological diagnosis of breast lesions show 53 (26.5%) malignant and 147 (73.5%) as benign. Table 3 shows result of FNAC taking histopathology as gold standard. True positive (TP) were recorded as 49 (24.5%), 16(8%) false positive (FP), 8(4%) false negative (FN) and 127(63.5%) as true negative (TN), sensitivity was 85.96 %, specificity was 88.81 %, positive predictive value (PPV) was 75.38% and negative predictive value (NPV) was 94.07%.

Table 1: Age Distribution

Age (yrs)	No. of Patients	%age
20-30	90	45
31-40	47	23.5
41-50	32	16
51-60	29	14.5
>60	02	01
Total	200	100

Fig. 1: GENDER DISTRIBUTION

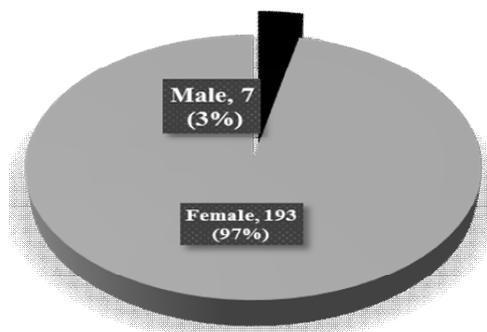


TABLE 2: Findings of breast lesions on histopathology

Breast Lesion	No. of patients	% age
Malignant	53	26.5
Benign	147	73.5
Total	200	100

Table 4: RESULTS OF FNAC(HISTOPATHOLOGY AS GOLD STANDARD)

Results of FNAC	Results of histopathology		Total
	Positive (%)	Negative (%)	
Positive	True positive(a) 49 (24.5%)	False positive (b) 16(8%)	a + b 65(32.5%)
Negative	False negative(c) 8(4%)	True negative (d) 127(63.5%)	c + d 135(67.5%)
Total	A + c 57(28.5%)	b + d 143(71.5%)	n 200

Sensitivity = $a / (a + c) \times 100 = 85.96 \%$

Specificity = $d / (d + b) \times 100 = 88.81 \%$

Positive predictive value = $a / (a + b) \times 100 = 75.38\%$

Negative predictive value = $d / (d + c) \times 100 = 94.07\%$

DISCUSSION:

FNAC of the breast is an excellent, safe and cost-effective diagnostic procedure. The cost of FNAC is minimal, equipment is inexpensive and the technique is simple⁴. Breast aspiration can be done anywhere, at the patient bed, at physician office or at clinic. The most significant advantage of FNAC is the high degree of accuracy, rapid results, and a less invasive procedure than a tissue biopsy. FNAC of the breast can reduce the number of open breast biopsies.⁵

Histopathological diagnosis of breast lesions in this study showed 53 (26.5%) malignant lesions and 147 (73.5%) as benign. Table 3 shows result of FNAC taking histopathology as gold standard. True positive (TP) were recorded as 49 (24.5%), 16(8%) false positive (FP), 8(4%) false negative (FN) and 127(63.5%) as true negative (TN), sensitivity was 85.96 %, specificity was 88.81 %, positive predictive value (PPV) was 75.38% and negative predictive value (NPV) was 94.07%.

Different studies have shown false positive results, ranging from 0-2% and false negative ranging from 7-22%.^{6,7} The different reasons given are usually the sampling errors, microscopy errors and the interpretative errors by the cytologists.⁸ In the literature the suspicious

results range from 3-18%.⁹ In the study of Kamal F et al, the suspicious results were 3.39%.¹⁰ Thirty two cases were found benign both on FNAC and biopsy, and 1 case diagnosed as fibrocystic disease on FNAC turned out to be malignant on biopsy. The sensitivity and specificity of fine needle aspiration cytology in this study for malignant lumps was 91.66% and 96.96% respectively, while in the study of Ch TH et al¹¹, it was 85.13% and 88.46%, in the study of Hebbar et al⁷ it was 93.10% and 100%, while in other studies it was 93% and 96.8%¹² and 96.42% and 100%.¹³ In the literature, the sensitivity ranges from 80 to 98% and the specificity may be up to 100%.¹⁴

Dysplasia also has a role in the false negative results.¹⁵ Small size of the tumors and certain histological types (lobular carcinoma, mucinous, tubular or medullary carcinoma) may contribute to false negative results.¹⁶ Fine needle aspiration cytology is the simplest method to evaluate breast lesions, the results of this procedure are mostly dependent on the size of the lump, experience of the individual performing the procedure and the experience of the cytologist. FNAC has proven to be an effective diagnostic

procedure in the evaluation of human breast lesions, and have a high degree of accuracy.¹⁷

CONCLUSION

The sensitivity and specificity of fine needle aspiration cytology in this study was 85.96% and 88.81%. FNAC is recommended for the diagnosis of breast lumps, however before going for definitive treatment, tissue diagnosis is necessary as there have been cases of false negative results for FNAC.

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