

Original Article

AGE DISTRIBUTION OF BREAST LESIONS ON FINE-NEEDLE ASPIRATION CYTOLOGY (FNAC) IN A TERTIARY CARE HOSPITAL

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Objects: To find the distribution and frequency of breast lesions on Fine-needle aspiration cytology.

Material and Methods: It was a descriptive study conducted in the Department of Histopathology; Services Institute of Medical Sciences and Services Hospital Lahore. The study included 464 patients with breast lump undergoing fine-needle aspiration cytology during a period of three years from January 2006 to December 2008.

Results: A total of 400 out of 464 (64 excluded due to poor yield) aspirates of patients with breast lump were included. Benign epithelial breast lesions were the most common lesions 234 (58.5%) with a mean age of 26.36(± 12), followed by Infiltrating Ductal Carcinoma 88 (22%) with a mean age 47.1(± 14).

Conclusion: Majority of the patients in our study belonged to third, fourth and fifth decade of life. Benign epithelial breast lesions were the most common followed by Infiltrating Ductal Carcinoma. Fine-needle aspiration cytology is the quickest, safest and cost effective method of diagnosing breast lump pathology in various age groups.

Keywords: Fine-needle aspiration cytology, Benign Breast lesion, Infiltrating Ductal Carcinoma

Introduction

Carcinoma of breast is the most common type of malignancy in women and the second leading cause of cancer death worldwide.^{1,2} The significant increase in incidence is due to an increase in screening programmes for breast cancer. Attempts should be made to take the necessary measures to consider optimal approaches to breast health care for everyone regardless of age, race, ethnicity or social status.³ The pioneers of fine-needle aspiration cytology (FNAC) were Martin and Ellis at Memorial Hospital, New York in early 1920s.⁴ Later in 1950 the interest in cytological diagnosis was renewed in Scandinavian countries, its accuracy, safety and simplicity have made it a very cost effective one stop clinical setting procedure.^{5,6} FNAC has been proved to be a dependable, relatively atraumatic method and quick tool for making early diagnosis of breast diseases as compared to biopsy studies.^{4,7}

The fine-needle aspiration cytology is extremely important because it gives the necessary information for the management regarding invasive diagnostic methods or surgical treatment.⁸ Majority of the European countries adopt similar reporting system for breast FNAC (C1-C5), in keeping with European guidelines for quality assurance in breast cancer screening and diagnosis.⁹

FNAC still plays a major role in diagnosis of (a) benign palpable breast lumps (b) staging of breast

carcinoma and (c) diagnosing metastatic disease.¹⁰

The results of FNAC may be influenced by incidence of a breast disease in a population, difference in procedure technique, operator expertise and interpretation of the results.¹¹ The aspiration cytology is most accurate when experienced cytologists are available and when

immediate assessment by professionals is performed for evaluation of material adequacy and repeated procedures if needed.¹² The adequacy of the fine-needle aspiration material from a palpable breast lesion is based upon certain facts like confidence of needle placement, cell preservation and correlation with clinical and mammographic findings (the triple test),¹³ however periodic follow up is necessary since benign triple test do not exclude the possibility of carcinoma.¹⁴

Positive fine needle aspiration cytology is useful for preoperative counseling as well as serving as a diagnostic procedure for clinically suspicious lesions before performing open biopsy.¹⁵ Fine-needle aspiration cytology of palpable breast lesions is a more sensitive method for the detection of carcinoma regardless of tumor size, type or differentiation.¹⁶

The accuracy of fine-needle aspiration cytology for non-palpable breast lesions is relatively low, and

Depends upon the skill of the aspirator, cytoscreener and cytopathologists¹⁷. If fine-needle aspiration cytology, physical examination and mammography are in agreement for a benign disease, a period of close observation with repetition of FNAC may be carefully entertained¹⁸. It is, however, pertinent to say that for clinically suspicious cases a negative fine-needle aspirate should not deter an open surgical biopsy¹⁹, even though physical examination, radiological studies and FNAC have been recognized to give a definite diagnosis in palpable breast lesions²⁰.

Keeping in view the fact that fine-needle aspiration is an excellent diagnostic tool in assessing clinically palpable breast masses²¹. Our study was conducted to aim at frequency and distribution of different breast lesions in palpable masses in a tertiary care teaching hospital like Services Hospital Lahore.

Objectives

The purpose of the study was to evaluate :-

- 1) Our experience with fine-needle aspiration cytology in palpable breast lesions in different age groups.
- 2) To find out the frequency of different breast lesions on FNAC in a tertiary care hospital like services hospital Lahore.

Material and Methods

This was a descriptive study conducted at the Department of Histopathology, Services Institute of Medical Sciences (SIMS) and Services Hospital, Lahore which is a tertiary care hospital providing diagnostic facilities to a wide range of population.

The study was conducted from January 2006 to December 2008. A total of 464 patients coming to out patient department were included with following inclusion criteria:-

- 1) Male and female patients of any age.
- 2) Patients with palpable breast masses.

Following patients were excluded on the basis of:-

- 1) Patients already diagnosed to have carcinoma breast.
- 2) Low yield or inadequate aspirates.

The fine-needle aspiration was done in the Department of Histopathology, Services Institute of Medical Sciences (SIMS) and Services Hospital, Lahore. The physical examination was done, the tumor size was noted, aspiration was done using

10cc. syringe having 22gauge hypodermic needle with application of vacuum, three to four passes were made as already described¹¹. The smears were prepared and fixed in absolute alcohol for haematoxylin and eosin and papaniculoe stains, and air dried for giemsa stain. Each smear was numbered, labeled properly, mounted and examined under the microscope.

Statistical Analysis

Data was analyzed descriptively and analytically. In analytical section mean age and (\pm) SD of the patients in various breast lesions was calculated and compared by t-test at 5% level of significance, while Chi-square test was applied to compare the distribution of different categories of breast lesions in older and younger age groups.

Results

The study included 464 patients presenting with breast lump, ranging in age from 9-90 years. The maximum number of cases were in third, fourth and fifth decade (**Table 1**).

Out of 464 fine-needle aspirates 64(13.8%) were poor in yield and were found to be inadequate for reporting. Out of the rest of 400 aspirates 69(17.2%) were diagnosed a inflammatory lesions, 60(15%) fibrocystic disease, 165(41.2%) fibro adenoma, 7(1.7%) gynecomastia, 2(0.5%) intraductal papilloma, 88(22%) infiltrating ductal carcinoma, 6(1.5%) phylloides tumor and 3(0.7%) malignant stromal tumor(**Table 2, Fig; 1**).

Chi-square test was applied to compare the distribution of different categories of breast lesions in older and younger age groups. Significantly higher number of patients ($p < 0.000$) with infiltrating ductal carcinoma were more than 40 years of age as compared with those having inflammatory lesions, whereas benign epithelial lesions were significantly found ($p < 0.000$) in patients below 40 years of age (**Table 3**).

In order to compare the mean ages of different lesions students t-test was applied. The mean (\pm SD) age of various breast lesions ranged from 22.4(\pm 8.8) years to 47.5(\pm 10.6) years, with significantly higher ($p < 0.0001$) mean age for infiltrating ductal carcinoma (47.1 \pm 14.4) years as compared to inflammatory and benign epithelial lesion (**Table 4**).

Comparison between the mean ages of epithelial benign and malignant lesions after application of student's t-test showed highly significant ($p < 0.000$) number of cases with mean age (26.36 \pm 12.) years

Table-1: Number of Patients with Breast Lump in Different Age Groups.

Age group in years	Numbers	Percentage
0-9	5	2.34
10-19	02	0.43%
20-29	89	19.18%
30-39	138	29.74%
40-49	94	20.25%
50-59	76	16.37%
60-69	24	6.20%
70 above	12	2.58%
Total	464	100%

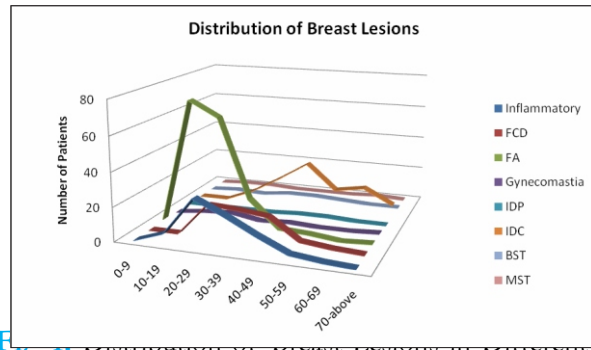


Fig-1: Distribution of Breast Lesions in Different Age Groups

FCD= Fibrocystic Disease, FA= Fibro adenoma, IDP= Intra Ductal Papilloma, IDC= Infiltrating Ductal Carcinoma, BST= Benign Stromal Tumor, MST= Malignant Stromal Tumor.

Table-2: Distributions of Breast Lesions by cause and age groups.

Age Groups (yr)	Inflammatory	FCD	FA	Gynecomastia	IDP	IDC	BST	MST
0-9 n=1(0.25)	0	0	1 (0.25)	0	0	0	0	0
10-19 n=84(21)	6 (1.5)	0	74 (18.5)	2.(0.5)	0	0	1 (0.25)	1 (0.25)
20-29 n=123(30.75)	28 (7)	19 (4.8)	65 (16.2)	3 (0.75)	0	7 (1.75)	0	1 (0.2)
30-39 =76(119)	20 (5)	19 (4.5)	19 (4.8)	0	0	17 (4.2)	2 (0.5)	0
40-49 n=62(15.5)	11 (2.75)	16 (4)	3 (0.75)	1 (0.25)	1 (0.25)	28 (7)	2 (0.5)	0
50-59 n=24(6)	3 (0.75)	4 (1)	2 (0.5)	0	1 (0.25)	13 (3.25)	0	0
60-69 n=20(5)	1 (0.25)	2 (0.5)	0	0	0	16 (4)	0	1 (0.25)
70-above n=10(2.5)	0	1 (0.25)	1(0.25)	1 (0.25)	0	7 (1.75)	0	0
Total n=400 (100)	69 (17.25)	60 (115)	165 (41.25)	7 (1.75)	2 (0.5)	88 (22)	6 (1.5)	3 (0.75)

FCD= Fibrocystic Disease, FA= Fibro adenoma, IDP= Intra Ductal Papilloma, IDC= Infiltrating Ductal Carcinoma, BST= Benign Stromal Tumor, MST= Malignant Stromal Tumor. Figures in parenthesis indicate percentages

Table-3: Distributions of Breast Lesions by cause and age groups.

Age Groups (yr)	Inflammatory	Benign epithelial lesion	Malignant epithelial lesion	Benign stomal tumors	Malignant stomal tumors
<40 n=284 (71)	54* (13.5)	201 (50.25)	24 (6)	3 (0.75)	2 (0.5)
>40 n=116 (29)	15 (3.75)	33 (8.25)	64 (16)	3.(0.75)	1 (0.25)
Total 400 (100)	69 (17.25)	234 (58.5)	**88 (22)	6 (1.5)	3 (0.75)

* $p < 0.000$ significant number of young patients had inflammatory lesions as compared to patients with malignant epithelial lesions.

** $p < 0.0000$ significant number of old patients had malignant epithelial lesions as compared to those with benign epithelial lesions

Figures in parenthesis indicate percentages

Table-4: Distribution of Range and Mean Age in Breast Lesions

Lesions patients	No of Patients	Range	Age (Years)	Meant SD
Inflammatory	69	10 - 64		30.9 ± 10.3
Fibrocystic disease	60	20 - 70		35.9 ± 10.9

Gynecomastia	07	20 - 90	34.2 ± 10.7
Fibro adenoma	165*	20 - 70	22.4 ± 8.8
Intraductal	02	40 - 55	47.5 ± 10.6
Infiltrating ductal carcinoma	88**	20 - 80	47.1 ± 14.4
Benign stromal tumor	06	17 - 50	35 ± 11.2
Malignant stromal tumors	03	19 - 70	34 ± 22.1

* $P < 0.0001$ significantly younger mean age as compared to inflammatory lesions

** $p < 0.0001$ significantly older mean age as compared to fibro adenoma and fibrocystic disease

Table-5: Range and Mean Age of Benign and Malignant

Proliferative lesions of Breast		Range	Age (Years)	Meant SD
Lesions patients	No of Patients			
Benign epithelial lesions	*234 (17.25)	90 - 90		26.36 ± 12.00
Benign stromal lesions	06 (1.5)	17 - 50		35 ± 11.2
Malignant epithelial lesion	88 (22)	20 - 80		47.1 ± 14.4
Malignant stromal lesions	03 (0.75)	19 - 60		34.6 ± 22.1

* $P < 0.0001$ significantly younger mean age as compared to malignant epithelial lesion

Discussion

The role of fine-needle aspiration cytology (FNAC) in establishing the diagnosis of breast disease has been clearly demonstrated¹⁰. Our study was focused at finding the frequency and distribution of different breast lesions and comparing the findings with similar studies. In this study 64(13.8%) aspirates were found to be poor in yield and inadequate, a finding comparable with a study where inadequacy was due to scarce material and suspected collagenous lesions¹¹.

In our study patients younger than 40 years 24 out of 400 (6%) were not found to have malignant epithelial lesions, whereas patients older than 40 years 64 out of 400 (16%) were significantly found to have malignant epithelial lesions. These findings are comparable with a local study, where 12 out of 30 (40%) of patients with breast carcinoma were more than 40 years of age¹. In another study incidence of malignancy in patients presenting with clinically palpable breast mass was (51%) in patients aged 40 years and younger and (74%) in patients aged 41 years and older²⁰.

Fibro adenoma (41.2%) and fibrocystic disease (15%) were the most common benign epithelial lesions, these findings are comparable to a study conducted at Armed Forces Institute of pathology (AFIP) Pakistan²¹. In our study the age range of

carcinoma of breast is 20-80 years with a mean age of 47 (± 14.4). These findings show a wider age range as compared to a study conducted at PNS Shifa Karachi⁵. The wider age range in our study could be due to trends in the general public to seeking medical advice at a later stage, and the results of FNAC may be influenced by incidence of a breast disease in a population at variable age.

During a period of three years 464 patients with breast lumps (including 8 males) were included in the study. The age range of our patients was between 9 to 90 years. This study highlights that breast lump is the most common presenting complain in adolescence and old age ,as it is highlighted in another study².

Conclusion

Majority of the patients in our study belonged to third, fourth and fifth decade of life. Benign epithelial breast lesions were the most common followed by Infiltrating Ductal Carcinoma. Fine-needle aspiration cytology is the quickest, safest and cost effective method of diagnosing breast lump pathology in various age groups.

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