ROLE OF FINE NEEDLE ASPIRATION CYTOLOGY IN BREAST LESIONS

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ABSTRACT

BACKGROUND

FNAC is a relatively simple procedure with good patient acceptance and low morbidity. It is an accurate, safe and repeatable procedure in the diagnosis of various breast lesions- both malignant and non-malignant.

Aims and Objectives:

1. To study the spectrum of both benign and malignant lesions of breast by FNAC.
2. To study the cytomorphological features of various breast lesions by FNAC.
3. To study the incidence of various breast lesions and categorisation of breast lesions on the basis of five tier system.

MATERIALS AND METHODS

The study was a descriptive cross-sectional study carried out from July 2016 to June 2017 in Department of Pathology, Saraswathi Institute of Medical Sciences, Anwarpur, Pilkhuwa, Hapur, U. P. The inclusion criterion included all the new cases of palpable breast mass sent for FNAC to the Pathology department including both males and females. Fine Needle Aspiration Cytology (FNAC) was performed on enrolled patients by the Pathologist. The staining methods used were- Giemsa Staining and Haematoxylin and Eosin Staining.

RESULTS

The most common affected age group was 21 to 40 years having 60% patients. FNAC results were divided according to the spectrum of lesions on cytomorphological interpretation and diagnosis into benign (61 cases), inflammatory (22 cases) and malignant (12 cases), atypical/ probably benign (3 cases) and no definite opinion (2 cases). In 12 malignant lesions, maximum cases that is 10 cases were of ductal carcinoma and only 2 were diagnosed as mucinous carcinoma. Categorisation of breast lesion on the basis of 5 tier system was done in which 2 cases were of C1, 65 cases of C2, 18 cases of C3, 3 cases of C4 and 12 cases of C5.

CONCLUSION

It can be concluded that FNA should be used as a routine diagnostic procedure for breast lumps due to its cost effectiveness, quick results and high accuracy.

KEY WORDS

FNAC, Breast, Benign, Malignant.

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BACKGROUND

Breast is a dynamic organ which undergoes cyclical changes under the influence of hormone and growth factors acting on the epithelial and stromal tissue throughout the reproductive life of a woman.¹ Various breast lesion are common in females with a wide range of variability from inflammatory lesions, benign and malignant breast lesions.² Breast lumps are common complaints of women visiting health organisation clinics, of which 80 to 85% are benign and rest are malignant.³⁻⁵ Breast cancer is the leading cause of morbidity and mortality in women.⁶ By 2020 breast cancer is set to overtake cervical cancer as the most common type of cancer among all women in India.⁷

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Fine needle aspiration cytology has become widely accepted as simple and cost effective diagnostic tool with high sensitivity and specificity.⁸

The sensitivity and specificity of Fine needle aspiration cytology (FNAC) as a diagnostic tool for palpable breast lumps are 65 - 99% and 96 - 100% respectively.⁹ Fine needle aspiration cytology (FNAC) is widely accepted as a reliable technique in the initial evaluation of palpable and non-palpable (guided biopsy) breast lumps. The procedure is simple, safe, cost effective, minimally invasive, rapid and as sensitive as biopsy.¹⁰ This study was conducted to study the spectrum of both benign and malignant lesions of breast, to study the cytomorphological features of various breast lesions by FNAC, to see the incidence and categorisation of lesion on basis of five tier system.

Aims and Objectives

1. To study the spectrum of both benign and malignant lesions of breast by FNAC.
2. To study the cytomorphological features of various breast lesions by FNAC.
3. To study the incidence of various breast lesions.

4. Categorisation of breast lesion on basis of five tier system.

MATERIALS AND METHODS

Study Design- A cross-sectional study.

Study Period - July 2016 to June 2017.

Study Place

Department of Pathology, Saraswathi Institute of Medical Sciences, Anwarpur, Pilkhuwa, Hapur, U. P.

Study Population

100 cases.

Inclusion Criteria

1. All the new cases of palpable breast mass sent for FNAC to the pathology department.
2. Includes both males and females.

Sample Size

Patients fulfilling all inclusion and exclusion criteria were enrolled in the study. A written informed consent was obtained from all the subjects before their enrolment in study.

A detailed clinical history was taken with special reference to menstrual age at marriage, age at first delivery, parity and habit of breast feeding, pain in breast and discharge from nipple. An inquiry was made regarding the use of oral contraceptive, dietary history, history of injury and radiation to the breast region and family history of tumours. A complete local and general examination including size of the breast and size of the lump. Consistency of lump, tenderness, fluctuation in the lump, fixity of the lump to skin or chest wall, any previous operative mark, any ulcerated area over the skin of breast and the presence of axillary lymph nodes was carried out in all 100 patients.

Fine needle aspiration cytology (FNAC) was performed on enrolled patients by the Pathologist. The staining methods used were Giemsa Stain, Haematoxylin and Eosin stain.

Statistical Analysis

All data was collected and verified. Collected data was subjected to SPSS (version 20) for analysis. Results were statistically evaluated by applying Chi-square test. P value of 0.05 was considered significant.

RESULTS

The most common affected age group was 21 to 40 years having 60% patients. FNAC results were divided according to the spectrum of lesions on cytomorphological interpretation and diagnosis into benign (61 cases), inflammatory (22 cases) and malignant (12 cases), atypical/ probably benign (3 cases) and no definite opinion (2 cases). In 12 malignant lesions maximum cases, that is 10 cases were of ductal carcinoma and only 2 were diagnosed as mucinous carcinoma. Categorisation of breast lesion on the basis of 5 tier system was done in which 2 cases were of C1, 65 cases of C2, 18 cases of C3, 3 cases of C4 and 12 cases of C5.

Gender	Frequency	Percent
Female	91	91.0
Male	9	9.0
Total	100	100.0

Table 1. Gender distribution of Patients

Out of 100 patients, 9 were males and 91 were females.

Type of Lesions	Frequency	%
Benign epithelial hyperplasia	17	17.0
Benign fibroadenoma	31	31.0
Benign fibrocystic lesion	9	9.0
Benign gynaecomastia	4	4.0
Inflammatory acute mastitis/abscess	10	10.0
Inflammatory granulomatous mastitis	4	4.0
Inflammatory fat necrosis	2	2.0
Inflammatory tubercular mastitis	6	6.0
Malignant- ductal	10	10.0
Malignant- mucinous	2	2.0
No definite opinion	2	2.0
Suspicious for benign/ atypical	3	3.0
Total	100	100.0

Table 2. Spectrum of various Breast Lesions

Benign fibroadenoma was most commonly seen (in 31 patients) followed by benign epithelial hyperplasia (17 patients), inflammatory acute mastitis (10 patients), malignant- ductal (10 cases), benign fibrocystic lesion (9 cases).

Cytological 5 Tier Grading System	Frequency	Percent
C1	2	2.0
C2	65	65.0
C3	18	18.0
C4	3	3.0
C5	12	12.0

Table 3. Categorisation of Breast Lesion on the basis of Five Tier System

Categorisation of breast lesion on the basis of 5 tier system was done in which 2 cases were of C1, 65 cases of C2, 18 cases of C3, 3 cases of C4 and 12 cases of C5.

Benign	Frequency	Percent (%)
Epithelial hyperplasia	17	27.87
Fibroadenoma	31	50.82
Fibrocystic lesion	9	14.75
Gynaecomastia	4	6.56
Total	61	100.0

Table 4. Cytomorphological Features of Benign Breast Lesion

Fibroadenoma is the commonest condition in the benign category followed by benign epithelial hyperplasia.

Inflammatory	Frequency	Percent (%)
Acute mastitis/ abscess	10	45.45
Granulomatous mastitis	4	18.18
Fat necrosis	2	9.09
Tubercular mastitis	6	27.27
Total	22	100.0

Table 5. Cytomorphological Features of Inflammatory Breast Lesion

Acute mastitis/ abscess is most common in inflammatory category followed by tubercular mastitis.

Malignant	Frequency	Percent (%)
Ductal	10	83.33
Mucinous	2	16.67
Total	12	100.0

Table 6. Cytomorphological Features of Malignant Breast Lesion

Type of Lesions	Age Group (in Years)				Total	Chi-Square Value	P Value
	0-20	21-40	41-60	>60			
Benign	16	36	9	0	61	32.59	0.001
Inflammatory	2	17	3	0	22		
Malignant	0	3	8	1	12		
No definite opinion	0	2	0	0	2		
Suspicious for benign/atypical	1	2	0	0	3		
Total	19	60	20	1	100		

Table 7. Association of Age with Breast Lesions

Statistically significant association is seen between age and breast lesions (p value less than 0.05).

Type of Lesions	Site			Total	Chi-Square Value	P Value
	Bilateral Breasts	Left Breast	Right Breast			
Benign	3	36	22	61	18.81	0.016
Inflammatory	0	7	15	22		
Malignant	0	2	10	12		
No definite opinion	0	2	0	2		
Suspicious for benign/atypical	0	0	3	3		
Total	3	47	50	100		

Table 8. Association of Site with Breast Lesions

Here, $p < .05$ statistically significant association was found between type of lesions vs. site.

DISCUSSION

The primary goal of FNA is to separate benign and malignant lesions, so that early diagnosis helps in management and reduces morbidity and mortality. Breast diseases are more common in women because oestrogen cyclically stimulates breast during their reproductive life.¹¹

The most common affected age group was 21 to 40 years, having 60% patients followed by 41 to 60 years having 20% patients. Similar age groups were observed by Chandanwale et al,¹² Likhar et al,¹³ Farkhanda et al and Godwins E et al.¹⁴ Haque et al¹⁵ have reported 30 - 40 years' age group as the most common age group in their study.

In our study, majority 55% of the patients with benign breast disease were in the age group of 21 - 40 and these findings are consistent with those of similar studies from Karki et al,¹⁶ Guray et al,¹⁷ Houssami et al,¹⁸ Dahri et al and Naveen et al.¹⁹

FNAC results were divided according to the spectrum of lesions on cytomorphological interpretation and diagnosis into benign (61 cases), inflammatory (22 cases) and malignant (12 cases), atypical/ probably benign (3 cases) and no definite opinion (2 cases). In our study, benign lesions were maximum. They were 7 times more common than malignant lesions. Kumar et al²⁰ also reported the same. Adesunkanmi et al²¹ have reported 87.2% of benign lesions and Chandanwale et al¹² have reported 80% of benign lesions.

The most common lesion in this study was fibroadenoma constituting 31% of the total cases. In the present study maximum cases of fibroadenoma were in the age group of 21-

30 years, which is similar to results shown by Kochhar et al,²² Khanzada et al,²³ Iyer et al,²⁴ Akhator et al,²⁵ Irabor et al²⁶ and Naveen et al.¹⁹

The number of malignant lesions in the present study were found to be twelve, which is in concordance with Park et al,²⁷ Rocha et al²⁸ and Domínguez et al.²⁹ Maximum number of malignant cases were found in 41 to 60 years of age group, which is similar to the results by Khan et al. In the 12 malignant lesions, maximum cases that is 10 cases were of ductal carcinoma and only 2 were diagnosed as mucinous carcinoma. Singh et al³⁰ reported that ductal carcinoma is the most common breast malignancy and was found in the age group of 41 - 60 years. The present study showed similar results. Mayun et al³¹ reported 40% cases of malignancy in their study. In our study, malignancy was found to be less as we cater rural population. Mortality and incidence is relatively lower in developing countries and other parts of globe in comparison to western population. Khan et al³² and Yeole et al³³ in an epidemiological study compared the breast cancer incidence of various countries and found that incidence rates were very high in developed countries. The incidence of breast cancer increases with age, more common in urban population and in women of higher socioeconomic group. They also suggested that apart from genetic causes, change in lifestyle is responsible for increase in incidence of malignant breast lesions.

CONCLUSION

FNAC is a relatively simple procedure with good patient acceptance and low morbidity. It is an accurate, safe and repeatable procedure in the diagnosis of various breast lesions- both malignant and non-malignant. Our study showed benign breast lesions are commoner than malignant lesions. Fibroadenoma is the commonest condition in the benign category followed by benign epithelial hyperplasia, whereas ductal carcinoma accounts for the highest number of malignant lesions.

The most common affected age group was 21 to 40 years having 60% patients. FNAC results were divided according to the spectrum of lesions on cytomorphological interpretation and diagnosis into benign (61 cases), inflammatory (22 cases) and malignant (12 cases), atypical/ probably benign (3 cases) and no definite opinion (2 cases). In 12 malignant lesions, maximum cases that is 10 cases were of ductal carcinoma and only 2 were diagnosed as mucinous carcinoma. There is statistically significant association seen between age and breast lesions and also between site and breast lesions. Categorisation of breast lesion on the basis of 5 tier system was done in which 2 cases were of C1, 65 cases of C2, 18 cases of C3, 3 cases of C4 and 12 cases of C5.

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