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Original Research

Cytomorphological Study of Spectrum of Breast Lesions Diagnosed On FNAC and Their Categorisation Using A Standardized IAC (International Academy of Cytology) Reporting System: A Study of 120 Cases

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ABSTRACT:
AIM: The present study was undertaken to study the Cytomorphological spectrum of breast lesions and to categorize them using a standardized IAC (International Academy of Cytology) reporting system.
MATERIALS AND METHODS: The study was conducted in a tertiary care teaching hospital. A total of 120 cases were included in the study. All patients above 15 years of age presenting to the Department of Pathology for FNAC of palpable breast lesions were included in the study after taking informed consent. Smears were prepared and stained with Giemsa stain and PAP stain and examined for cytological diagnosis. IAC Yokohama system was used for the final reporting and categorization of lesions.
RESULTS: The patient's age group ranged from 17 years to 75 years. The commonest age group was 25-35 years comprising 38 cases (31.66%) with 15-25 years age group following it in the second position with 28 cases (23.3%). As per the IAC categories, C2 (Benign) had the maximum number of cases comprising 104 cases (86.66%) followed by C5 (malignant) amounting to 9 cases (7.5%).
CONCLUSION: FNAC procedure is safe, reliable, cost-effective and time saving and plays an important role in screening, diagnosis and guides the further treatment plan. International academy of cytology (IAC) has developed a comprehensive and a standardized approach to FNAC reporting by categorising various breast lesions in C1-C5 categories. A standardized and structured reporting can enhance reproducibility; bring uniformity and clarity of FNAC reports.
KEYWORDS: FNAC, IAC, Fibroadenoma, Carcinoma.

INTRODUCTION

Breast carcinoma is one of the most common cancers worldwide in females and is an important cause of mortality and morbidity.[1] It has overtaken cervical carcinoma to be the most common carcinoma in Indian females.[2] Benign as well as malignant breast lesions commonly occur in the Indian population.[3] The worldwide-accepted protocol for diagnosis of breast lumps is the triple assessment and is done for the investigation of the breast masses comprising of clinical examination, radiological imaging studies and fine needle aspiration cytology (FNAC). FNAC was introduced as a primary investigation in the screening and diagnosis of breast lesions. FNAC procedure is safe, reliable, cost-effective, time saving and plays an important role in screening, diagnosis and guides the further treatment plan based on whether the lesion is diagnosed as benign or malignant. FNAC has a good sensitivity and accuracy in the diagnosis of breast lumps which could be malignant or benign. Multiple sampling from different angles and by using ultrasound guidance in smaller lumps further helps to improve accuracy. Muddegowda et al studied the diagnostic accuracy of FNAC on breast lesions which showed a very high accuracy (97%), specificity and sensitivity.[4] International academy of cytology (IAC) has developed a comprehensive and a standardized approach to FNAC reporting. They have categorized various breast lesions in C1-C5 categories.[5].

- C1-insufficient material (smears which are too sparsely cellular or poorly smeared or fixed to allow a cytomorphological diagnosis).
- C2-benign (cases having unequivocal benign cytological features).
- C3-atypical (cases with presence of predominantly benign cytological features with some features that are uncommon in benign lesions and may occur in malignant lesions)
- C4-suspicious (cases with some cytomorphological features of malignancy lesions but insufficient to make a definitive diagnosis of malignancy).
- C5-malignant (cases having unequivocal malignant cytological features).

A structured reporting can enhance reproducibility and clarity of reports among pathologists and clinicians.[1] Various studies have been done like those by Sharif A et al and Panwar H et al on the spectrum of breast lesions on FNAC with reference to IAC standardized approach. [1,2]
The present study was undertaken to study the cytomorphological spectrum of various breast lesions diagnosed on FNAC and to categorize various breast lesions with special reference to International Academy of Cytology (IAC) standardized reporting system.

MATERIALS AND METHODS: Aim of the study was to study the cytomorphological spectrum of breast lesions diagnosed on Fine needle aspiration cytology (FNAC) and to categorize various breast lesions with special reference to International Academy of Cytology (IAC) standardized reporting system. A total of 120 cases were studied.
Inclusion Criteria: All patients above 15 years of age presenting to the Department of Pathology at Gian Sagar Medical College and Hospital for FNAC of palpable breast lesions were included in the study. Both radiologically guided as well as non-guided FNACs were included in the study.
Exclusion criteria: Patients not giving consent to undergo FNAC procedure and patients less than 15 years of age was not included in the study. Participant informed consent form: Informed written consent was obtained from patients in local language after explaining the procedure to the patients. Detail of Procedure: After informed consent and before performing FNAC, a detailed history, general physical and clinical examination of the breast lumps was carried out. The area was cleaned with antiseptic solution and spirit. The skin over the lump was stretched and passes at different angles were taken. The procedure was repeated twice or thrice in some cases depending upon the size and gross appearance of the palpable mass or nodule. FNAC was done by using 10 or 20 cc disposable syringe with 21G needle under aseptic precautions. The cellular component was aspirated into a syringe and spread onto the glass slides for smear preparation. Each slide was positioned on the table and a small- or medium-sized drop of aspirated material was placed on one end and was spread with the help of a glass spreader to prepare the smear of the aspirate. Air dried smears were stained with May Grunwald Giemsa (MGG) stain and wet fixed smears with Papanicolaou (PAP) stain. The stained slides were observed under the microscope and FNAC reporting was done with reference to IAC standardized reporting system. Cytologically, the lesions were categorized into five-tier reporting format for breast lesions laid down by The International Academy of Cytology (IAC) that is, C1: inadequate/ insufficient material, C2: benign, C3: atypical probably benign, C4: suspicious of malignancy, and C5: malignant. [1,2] Safety measures for proposed test: All universal safety precautions were undertaken.

RESULTS:
The patient's age group ranged from 17 years to 75 years. The commonest age group was 25-35 years comprising 38 cases (31.66%) with 15-25 years age group following it in the second position with 28 cases (23.3%).
There were 6 male patients and 114 female patients. [Table:2]
As per the IAC categories, C2 (Benign) had the maximum number of cases comprising 104 cases (86.66%) followed by C5 (malignant) amounting to 9 cases (7.5%). C1 category amounted to 6 cases and 1 case of category C3. [Table:1]
In C2 category, Fibroadenoma accounted for 46 cases, benign breast disease comprised of 26 cases, inflammatory lesions accounted for 12 cases, 10 cases of fibrocystic lesion, 4 cases of gynaecomastia, 4 cases of fat necrosis and 1 case of lipomatous lesion and 1 case of lactational changes. [Figure:1,2], [Table:3]
Maximum incidence of fibroadenoma was found in age group of 21-30 years and the maximum incidence of carcinoma was found in 55-65 years. [Figure:3]

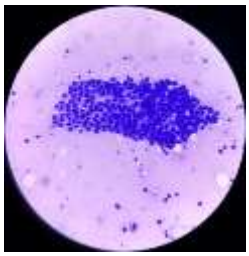

Figure 1: Microphotograph of a case of Fibroadenoma showing a tightly cohesive cluster of benign ductal epithelial cells with bare nuclei in background. [MGG 400X]

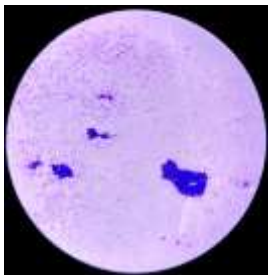

Figure 2: Microphotograph of a case of Gynaecomastia showing Tightly cohesive cluster of benign looking ductal epithelial cells in a fatty background. [MGG,100X]

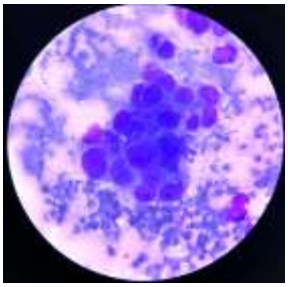

Figure 3: Microphotograph of a case of Carcinoma breast showing a loosely cohesive cluster of malignant cells exhibiting cellular atypia. [MGG,1000X]

IAC CATEGORY	NUMBER OF CASES	PERCENTAGE
C 1	6	5 %
C 2	104	86.66%
C 3	1	0.84%
C 4	0	0
C 5	9	7.5%

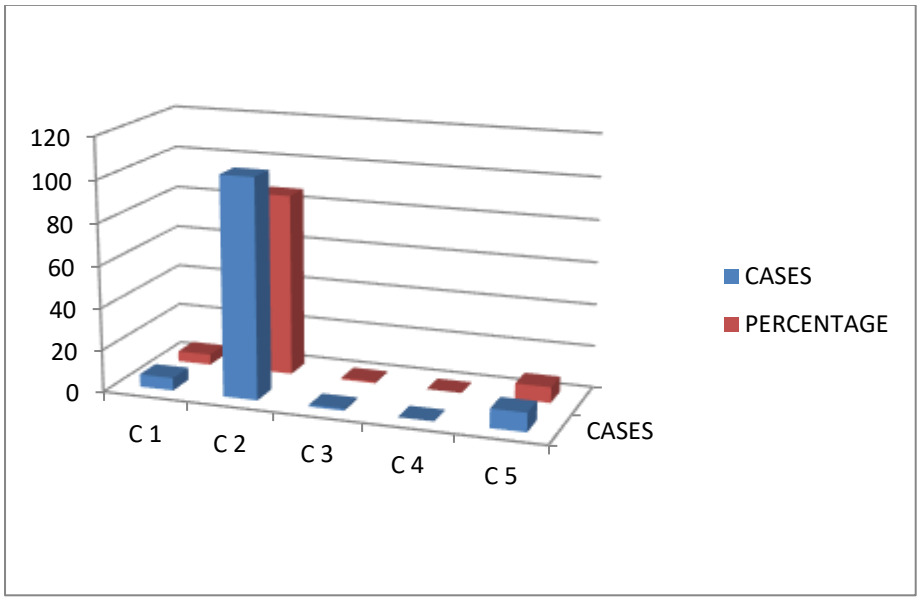

Table 1: Distribution of the cases as per IAC categorization

SEX	CASES
MALE	6
FEMALE	114

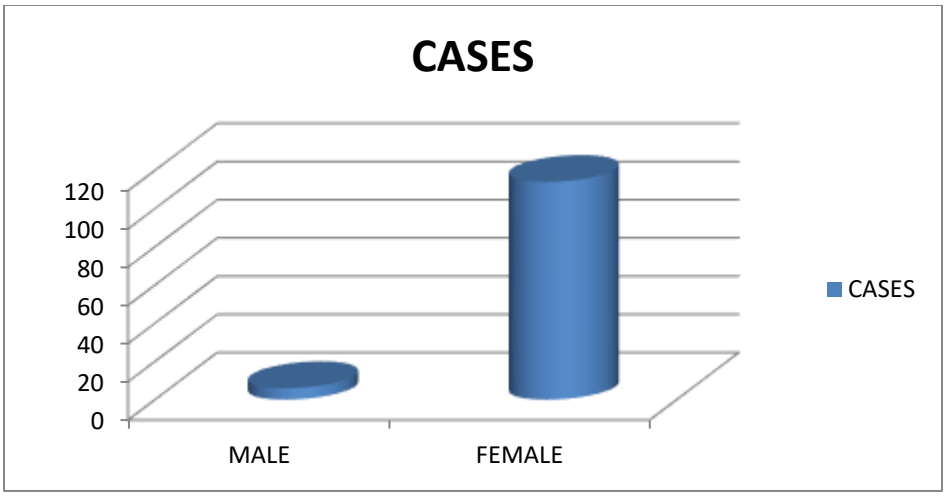

Table 2: Distribution of the cases as per sex of the patient

DIAGNOSIS (C2 CATEGORY)	NUMBER OF CASES (104)
Fibroadenoma	46
Benign breast disease	26
Inflammatory	12
Fibrocystic lesion	10
Gynaecomastia	4
Fat necrosis	4
Lipomatous lesion	1
Lactational changes	1

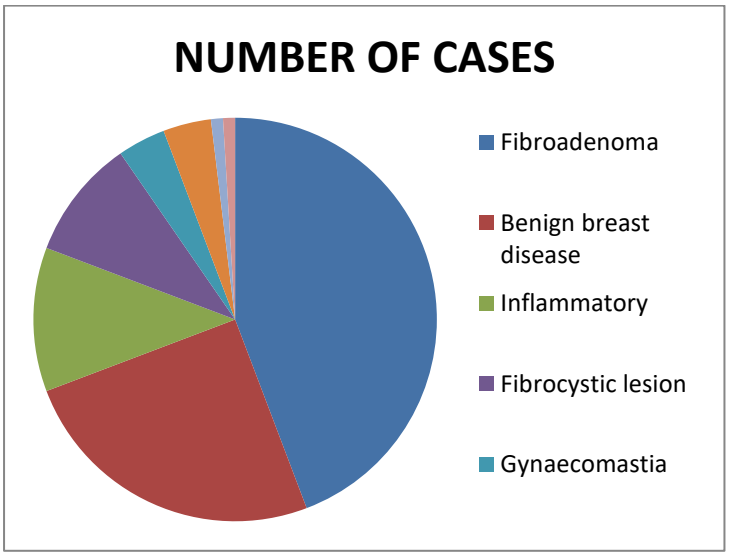

Table 3: Distribution of various cases in the C2 category

DISCUSSION

The protocol for diagnosis of patients presenting with breast lumps is the triple assessment comprising of clinical examination, radiological imaging studies and fine needle aspiration cytology (FNAC). FNAC is one of the important primary investigations in the screening and diagnosis of breast lesions. FNAC procedure is safe, reliable, cost-effective and time saving. It acts as a screening tool to find out whether a breast lump is benign or malignant and can aid in relieving patient's stress or fear of malignancy and also guide the clinician to decide the further plan of treatment depending upon whether the lesion is benign or malignant. FNAC has a good sensitivity and accuracy

in the diagnosis of breast lumps. Muddegowda et al studied the diagnostic accuracy of FNAC on breast lesions which showed a very high accuracy (97%), specificity and sensitivity.[4] IAC has established a comprehensive and standardized approach to categorize FNAC of breast lesions into C1 to C5. Adopting a structured reporting pattern like IAC can help pathologists across the globe to improve the quality, clarity, and reproducibility of reports and eventually contribute positively to diagnosis and further management of patients and hence improve health care and even facilitate further research in this field. [2] The present study comprised of 120 cases of patients above 15 years of age presenting to the Department of Pathology at Gian Sagar Medical College and Hospital for FNAC of palpable breast lesions. The patients ranged from 17 years to 75 years of age. The commonest age group was 25-35 years comprising 38 cases (31.66%) followed by 15-25 years age group with 28 cases (23.3%). Studies done by Panwar H et al and Qadri S et al had similar results.[2,6] Out of 120 cases, there were 6 male patients and 114 female patients.
Amongst the category of lesions, IAC category C2 (Benign) had the maximum number of cases comprising 104 cases (86.66%) followed by C5 (malignant) amounting to 9 cases (7.5%). A similar study done by Panwar et al reported 186 (82.6%) cases of C2 and 19 (8.4%) cases of C5 category and a study done by Verma D et al reported 65.7% cases of C2 followed by 20.8% cases of C5.[2,7] These results are consistent with the results of our study. C 1 category amounted to 6 cases where material was inadequate for interpretation and repeated aspiration yielded only fatty or blood mixed aspirate. 1 case was reported in the C3 category. Among the C2 category lesions, majority of the cases were of fibro adenoma comprising of 46 cases (44.2%), followed by benign breast disease comprising of 26 cases (25%). The inflammatory lesions accounted for 12 cases and 10 cases of fibrocystic lesion, 4 cases of gynaecomastia, 4 cases of fat necrosis and 1 case each of lipomatous lesion and lactational changes breast were reported. Similar results of fibroadenoma constituting the maximum cases in the benign category were reported by Sankaye S et al (46.56%), Qadri S et al and Embaye KS et al (39.01%).[3.6,8] Maximum incidence of fibroadenoma was found in age group of 21-30 years. Similar results were found in studies done by Madan M et al. [9] All the malignant cases reported in C5 malignant category were ductal carcinomas. This is in concordance to the results obtained by studies done by Panwar H et al and Qadri S et al.[2,6] In our study, maximum incidence of carcinoma was found in 55-65 years. Similar results of malignant lesions being more common in females above 50 years were reported in a study done by Aarthi KB et al.[10]

CONCLUSION:

FNAC procedure is safe, reliable, cost-effective and time saving and plays an important role in screening, diagnosis and guides the further treatment plan. FNAC has a good sensitivity and accuracy in the primary categorization and diagnosis of breast lumps. International academy of cytology (IAC) has developed a comprehensive and a standardized approach to FNAC reporting by categorising various breast lesions in C1-C5 categories. A standardized and structured reporting can enhance reproducibility; bring uniformity and clarity of FNAC reports.

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