



ORIGINAL RESEARCH PAPER
 Breast Surgery

A STUDY TO CLASSIFY THE FINE NEEDLE ASPIRATES OF BREAST LUMPS AS PER THE IAC YOKOHAMA SYSTEM FOR REPORTING BREAST PATHOLOGY IN THANJAVUR MEDICAL COLLEGE
KEY WORDS: Fine Needle Aspiration, Breast Lumps, IAC Yokohama System, Breast Pathology, Cytology Classification, Diagnostic Accuracy, Breast Cancer.

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ABSTRACT	Background: Fine Needle Aspiration (FNA) is a widely used, minimally invasive diagnostic procedure for the evaluation of breast lumps. Accurate classification of FNA cytology is crucial for determining the appropriate clinical management. The IAC Yokohama System, developed by the International Academy of Cytology (IAC), provides a standardized framework for reporting breast pathology, aiming to improve diagnostic accuracy and consistency across different healthcare settings. Objective: This study aims to classify breast lump fine needle aspirates using the IAC Yokohama System and evaluate its effectiveness in distinguishing benign, malignant, and indeterminate lesions. Methods: A retrospective analysis was conducted on a series of breast lump FNAs performed at THANJAVUR MEDICAL COLLEGE. The cytology slides were classified according to the IAC Yokohama System, which includes categories such as benign, suspicious, malignant, and non-diagnostic. The histopathological correlation was established where available, and the sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) of the system were calculated. Results: A total of 569 breast FNAs were analysed. The majority of cases were classified as 68.5% benign, 18.2% malignant, and (6.6%) atypical. The sensitivity and specificity of the IAC Yokohama System in predicting malignant lesions were found to be 95.16% and 100%, respectively. The system demonstrated a high concordance with histopathological findings, suggesting its reliability in clinical practice. Conclusion: The IAC Yokohama System provides a valuable framework for the classification of breast lump FNAs, facilitating consistent and accurate reporting. Its application enhances diagnostic precision, which is critical for patient management. The study supports the integration of the IAC Yokohama System into routine breast pathology practice for better clinical outcomes. Further prospective studies are recommended to refine its diagnostic utility across diverse populations and healthcare settings .
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INTRODUCTION Breast cancer is one of the leading causes of morbidity and mortality among women . Early detection and accurate diagnosis are essential in improving patient conditions, particularly in terms of treatment selection and prognosis. One of the primary diagnostic tools used in the evaluation of breast lesions is Fine Needle Aspiration (FNA) cytology, a minimally invasive procedure that allows for the collection of cellular material from breast lumps for diagnosis. FNA offers several advantages, including rapid results, minimal pain and cost-effectiveness, making it an essential tool in clinical practice^{1,8} However, inspite of its widespread use, the interpretation of FNA samples can be challenging due to the overlap in cytological features between benign, malignant, and atypical lesions. To address these challenges, various standardized systems have been formulated to distinguish and report the cytological findings in a structured and orderly manner. One such system is the IAC Yokohama System for Reporting Breast Pathology, which provides a comprehensive framework for the classification of breast cytology specimens based on their malignancy risk, diagnostic accuracy, and histopathological correlation.⁸ The IAC Yokohama System offers a orderly approach to categorize breast lesions into various groups, allowing communication among surgeon, pathologists, and patients. It is formulated to improve the reproducibility of diagnoses, guide treatment decisions, and finally contribute to better surgical outcomes. Inspite of its advantages, the adoption of this system has not been universally widespread, and its effectiveness and reliability in the context of breast FNA	cytology remain subjects of ongoing evaluation.⁷ This study aims to classify Fine Needle Aspirates of breast lumps according to the IAC Yokohama System and evaluate its diagnostic performance in a clinical setting. The research seeks to assess the practical applicability of this system in routine diagnostics , explore potential areas of improvement, and provide insights into its role in improving the accuracy of breast cancer diagnosis. The results of this study will contribute to the growing body of knowledge surrounding the use of standardized reporting systems in breast pathology and provide important information for surgeons and pathologists in the treatment of breast lumps.^{3,9} The Objectives OfThe Study Include: 1. To classify breast lumps based on Fine Needle Aspiration cytology using the IAC Yokohama System.^{1,3,11} 2. To assess the diagnostic accuracy, sensitivity, and specificity of the system in identifying malignant lumps.^{6,9} 3. To evaluate the concordance between cytological diagnoses and histopathological reports. 4. To discuss the advantages and limitations of the IAC Yokohama System in routine clinical practice.^{7,10} Through this research, it is hoped that the role of structured reporting in FNA cytology will be better understood, and that it will help in the development of more reliable diagnostic tools for breast cancer detection. Reporting Of Breast Cytology Using Iac Yokohama System^{4,9,10}
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S. No.	Cytological categories	Explanation
1.	C1	Inadequate/Insufficient
2.	C2	Benign
3.	C3	Atypical
4.	C4	Suspicious of malignancy
5.	C5	Malignant

Aim

The main aim and objectives of our study were to classify breast fine needle aspirates according to the IAC Yokohama system and assess the risk of malignancy, sensitivity, specificity, positive predictive value, negative predictive value, and accuracy.

MATERIALS AND METHODS

- Study Design:**Retrospective study
- Study Period :** Jan 2023 to dec 2023
- Study Place:**Thanjavur medical college

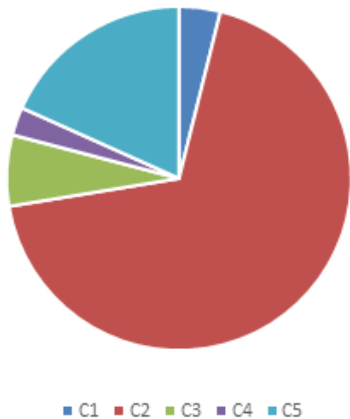
All breast FNAs done in the above period were retrieved and classified into five categories according to the Yokohama system. Histopathological diagnosis was also retrieved.

Using a histopathological diagnosis as the gold standard, sensitivity, specificity, PPV,NPV, and diagnostic accuracy were calculated. For each of the five categories, the risk of malignancy was also assessed

RESULTS

Totally 569 FINE NEEDLE ASPIRATES were done during period of 1 year. Age group of patients is between 15 years to 79 years. The 569 breast FNAs were categorized according to the IAC Yokohama System as follows:

- C1.Insufficient- 22 cases (3.8%)
 C2.Benign- 390 cases (68.5%)
 C3.Atypical- 38 cases (6.6%)
 C4.Suspicious of malignancy- 15 cases (2.6%)
 C5.Malignant- 104cases (18.2%).



Postoperative Histopathological correlation was available in 251 cases (44.1%). out of remaining 318 patients, 108 patients were medically managed with evening primrose oil and vitamin E and 210 patients are in regular followup .Even C1 category patients were subjected to excision biopsy and histopathological correlation done. The histopathological diagnoses for the breast lesions in different cytological categories were evaluated and are summarized with cytohistological correlation

- In above distribution, and histological correlation done on 251 cases
- True positive cases-59
 - True negative cases-132
 - False positive cases-0
 - False negative cases-3

	Insufficient	Benign	Atypical	Suspicious of Malignancy	Malignant
Histological Benign diagnosis	18 (Fibrocystic disease-7, Inflammatory lesion-2, Gynaecomastia-2, Benign phyllodes-3, Fibroadenoma- 4)	132(Fibroadenoma- 88, Abscess - 12, Galactocele - 6, Granulomatous mastitis- 2, Fibrocystic disease- 15, Fat necrosis- 2, Gynaecomastia-7)	21 (Cellular FA- 6, Benign phyllodes-7, Benign papillary lesion- 4, Fibroadenoma with usual ductal hyperplasia- 4)	3 (Cellular FA- 3)	0
Histological Malignant diagnosis	1 (Invasive ductal carcinoma - 1)	3 (DCIS-2, Invasive ductal carcinoma- 1)	5 (Invasive ductal carcinoma-3, Papillary DCIS- 2)	9 (Invasive ductal carcinoma- 7, DCIS- 2)	59 (DCIS-2, Invasive ductal carcinoma- 50, Invasive lobular carcinoma- 7)
Risk of Malignancy	5.2%	2.2%	19.2%	75%	100%
		HPE BENIGN	HPE MALIGNANT	TOTAL	
INSUFFICIENT C1		18	1	19	
BENIGN C2		132	3	135	
ATYPICAL C3		21	5	26	
SUSPICIOUS OF MALIGNANCY C4		3	9	12	
MALIGNANCY C5		0	59	59	
TOTAL		174	77	251	
Sensitivity			TP/(TP+FN)	95.16	
Specificity			TN/(FP+TN)	100	
False Positive Rate			FP/(FP+TN)	0	
False Negative Rate			FN/(FN+TP)	4.83	
Positive Predictive Value (PPV)			TP/(TP+FP)	100	
Negative Predictive Value (NPV)			TN/(TN+FN)	97.77	
Overall Diagnostic Accuracy			TP+TN/(TP+TN+FP+FN)	98.44	

CONCLUSION

- Breast FNAC is the reliable test to diagnose breast lesions, especially malignant breast lesions.
- Sensitivity, specificity, negative predictive value, positive predictive value, and diagnostic accuracy were all statistically significant in this investigation ^{2,4,5}
- Utilizing the IAC Yokohama breast cytology reporting system then aids in standardizing reporting across numerous institutes and stratifying cases according to the risk of malignancy for appropriate follow-up management

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