Journal of Advanced Medical and Dental Sciences Research

@Society of Scientific Research and Studies

Journal home page: www.jamdsr.com doi: 10.21276/jamdsr ICV 2018= 82.06

(e) ISSN Online: 2321-9599; (p) ISSN Print: 2348-6805

Original Research

A Comparative study to determine the efficacy of FNAC and histopathology in breast lesions

Snigdha Mukharji[1], A. Pandit[2], Sudhamani S.[3]

[1]Assistant Professor, Department of Pathology, D.Y Patil School of Medicine, Navi Mumbai, Maharashtra;
[2]Professor, Department of Pathology, D.Y Patil School of medicine, Navi Mumbai, Maharashtra;
[3]Associate Professor, Department of Pathology, D.Y Patil School of Medicine, Navi Mumbai, Maharashtra

***ABSTRACT*:**
Background: Breast carcinoma has seen an increasing rise in incidence in India overtaking carcinoma cervix in the past decade. Major factors contributing to such steep rise are – late marriages followed by late motherhood and modernization which has yielded to a disease in the duration of breast feeding. FNAC is a simple, inexpensive, minimally invasive, patient friendly, easily accessible procedure with virtually no complications. Patient compliance is also better as it does not require any indoor admission and patient can go home immediately after the procedure. **Aim of the study:** To find out if FNAC could be used as a diagnostic tool in palpable breast lesions for patients to ensure better and early treatment. **Materials and methods:** The present study was conducted in the Department of General Pathology of Padmasree Dr. D Y Patil Hospital and Research Centre, Nerul, Navi Mumbai. This study was a retrospective and prospective kind of study. Female patients who were having palpable breast lump attending Padmasree Dr. D Y Patil Hospital and Research Centre, Nerul, Navi Mumbai were the subject of study. The period of study was between June 2008 to January 2013. Sample size was 105 patients (Cytology and Histopathology correlated samples). In cases of retrospective study, old records of histopathology section were studied from all breast lesions including biopsy and FNAC slides were examined. **Results:** Only those breast lesions which were neoplastic, formed the basis of this study. The following observations were made. The age of patients ranged from 14-85 years. The maximum number of lesions were seen in the age group of 21-30 years (27.61%) followed by 31-40 years (23.81%) followed by 41-50 years (20.95%) The least number of cases were seen in patients of age group of > 60 years (7.62%). Clinically, 74 cases were considered benign and 31 were considered malignant. Of the 74 cases which were clinically benign, 70 were benign on histopathology and 3 cases were histopathologically malignant. The case which was misinterpreted turned out to be IDC- NOS. Of the clinically diagnosed malignant cases, 6 were malignant on histopathology. All the misinterpreted cases were IDC- NOS. Cytology 1 case was inadequate for opinion, 73 were benign and 31 were malignant. **Conclusion**: Within the limitations of the present study, it can be concluded that benign neoplasms of the breast are more common than malignant ones. FNAC is a very effective diagnostic aid and is easy and safe to perform. In cases where FNAC is inconclusive or when the clinician has a suspicion of biopsy it is always advisable to go for a biopsy or mastectomy. A cytopathologist should always take utmost care while reporting and whenever in doubt a biopsy should be suggested to avoid false diagnosis.
Key words: Breast carcinoma, benign, malignant, FNAC.

Received: 25 October, 2019 Revised: 20 November, 2019 Accepted: 22 November, 2019

Corresponding Author: Dr. Snigdha Mukharji, Assistant Professor, Department of Pathology, D.Y Patil School of Medicine, Navi Mumbai, Maharashtra, India

This article may be cited as: Mukharji S, Pandit A, S Sudhamani. Comparative study to determine the efficacy of FNAC and histopathology in breast lesions. J Adv Med Dent Scie Res 2019;7(12):81-85.

INTRODUCTION:

Breast carcinoma has seen an increasing rise in incidence in India overtaking carcinoma cervix in the past decade. Major factors contributing to such steep rise are – late marriages followed by late motherhood and modernization which has yielded to a disease in the duration of breast feeding. [1,2] The development in patient education and screening programmes have also permitted a marked increase in the number of tumors detected. In India—it comprises about 25-35 % of all cancers in women. out of one lakh women are diagnosed with breast cancer. [3] FNAC is a simple, inexpensive, minimally invasive, patient friendly, easily accessible procedure with virtually no complications. Patient compliance is also better as it does not require any indoor admission and patient can go home immediately after the procedure. [4] Pain is also minimal both during and after the procedure. Turnover time foe reports is also minimal and treatment can be started early. The disadvantages of the FNAC procedure is that at times false negative reports are also seen with respect to malignant lesions. [5] Thus, many surgeons at times question the authenticity of FNAC and prefer to confirm it with an excision biopsy. However, the advantages overweigh the disadvantages and so palpable lesions can be accurately diagnosed by Triple Test FNAC, physical examination and mammography. [6] Another advantage of FNAC is that in case of confusion or inadequacy, the procedure can be repeated. Hence, the present study was planned to find out if FNAC could be used as a diagnostic tool in palpable breast lesions for patients to ensure better and early treatment.

MATERIALS AND METHODS:

The present study was conducted in the Department of General Pathology of Padmasree Dr. D Y Patil Hospital and Research Centre, Nerul, Navi Mumbai. The ethical clearance for the study was approved from the ethical committee of the hospital. This study was a retrospective and prospective kind of study. Female patients who were having palpable breast lump attending Padmasree Dr. D Y Patil Hospital and Research Centre, Nerul, Navi Mumbai were the subject of study. The period of study was between June 2008 to January 2013. Sample size was 105 patients (Cytology and Histopathology correlated samples).

Inclusion Criteria

All the histopathological breast specimens that have been preceded with a FNAC procedure were studied.

Exclusion criteria

Inadequately fixed and autolysed specimens
Breast specimens for which FNAC was not done before histopathology
FNAC smears with inadequate cellularity

Data Collection

In outpatient department a detailed history and thorough physical examination of the patient having palpable breast lump was carried out and entered in the proforma. The patient was informed about the procedure and informed consent was obtained from the patient prior to the fine needle aspiration cytology of the patient. The standard procedure was followed making use of a 10 ml syringe bearing a 23-gauge needle.

The mass was located clinically and fixed in place with free hand. The skin over the puncture was sterilized with betadine or spirit. Once the tumor was fixed full vacuum was applied, while the needle was moved back and forth in the mass with short strokes. The syringe piston was slowly released and allowed to return to the neutral position. The needle was then withdrawn from the mass. The needle was temporarily removed from the apparatus and the syringe was filled with air by pulling back the plunger. The syringe was reattached. The specimen was expressed on a glass slide. It was then immersed in a fixative of 95% methyl alcohol. The slides were stained with Papanicolau or Geisma stain. The interpretation of the slide was made by the same cytopathologist.

The cytological diagnosis was based on the physical findings, age along with the microscopic examination of the aspirated cells. The final cytological diagnosis was made and informed to the patient. If the lumps on the cytological examination was reported as malignant, then mastectomy was carried out and specimen was sent for histopathological diagnosis.

In those cases which were reported as “suspicious of malignancy” they underwent biopsy before modified radical mastectomy for confirmation of malignancy.

Table 1: 5-scale reporting system for FNAC of breast lumps

Categories	Descriptor
C1	Acellular
C2	Benign
C3	Likely benign but with some atypia
C4	Suspicious of malignancy
C5	Malignant

In cases of retrospective study, old records of histopathology section were studied from all breast lesions including biopsy and FNAC slides were examined.

Data Entry and Analysis

Data entry and analysis were done using MS Excel 2007. Appropriate statistical tests were applied.

RESULTS:

The present study comprises of 105 cases of breast neoplasms which were evaluated by clinical examination and fine needle aspiration cytology (FNAC). The study was conducted from June 2008 – January 2013 in the Department of Pathology, Padmasree D Y Patil Hospital and Research Centre, Navi Mumbai. All the cases were subsequently evaluated histopathologically. Only those breast lesions which were neoplastic, formed the basis of this study. The following observations were made. The age of patients ranged from 14-85 years. The maximum number of lesions were seen in the age group of 21-30 years (27.61%) followed by 31-40 years (23.81%) followed by 41-50 years (20.95%) The least number of cases were seen in patients of age group of > 60 years (7.62%) **(Table 2, Fig 1)**. Clinically, 74 cases were considered benign and 31 were considered malignant. Of the 74 cases which were clinically benign, 70 were benign on histopathology and 3 cases were histopathologically malignant. The case which was misinterpreted turned out to be IDC- NOS. Of the clinically diagnosed malignant cases, 6 were malignant on histopathology. All the misinterpreted cases were IDC- NOS. Cytology 1 case was inadequate for opinion, 73 were benign and 31 were malignant. The case which was reported as inadequate for opinion was diagnosed as fibrocystic disease on histopathology. Among the 73 cases of cytologically benign lesions, histopathology confirmed the benign nature in 70 cases while in 3 cases turned out to be malignant. All other cases were diagnosed as IDC-NOS on histopathology. All the cytologically proven malignant lesions were confirmed by histopathology. **(Table 3, Fig 2)**

Table 2: Age Distribution pattern in breast neoplasms:

Age group (years)	Number of Cases	Percentage
< or = 20	**11**	**10.48**
21-30	**29**	**27.61**
31-40	**25**	**23.81**
41-50	**22**	**20.95**
51-60	**10**	**09.52**
>60	**8**	**07.62**
Total	**105**	**100**

Figure 1: Age Distribution pattern in breast neoplasms

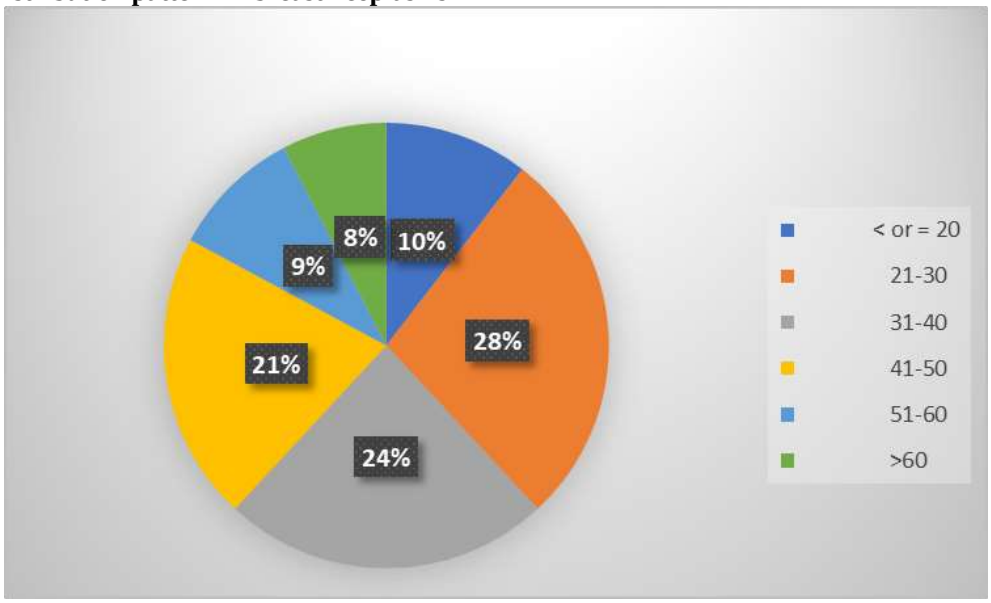

Table 3: Comparison of FNAC diagnosis with histopathology

	Histopathologic	Diagnosis	
FNAC Diagnosis	Benign	Malignant	Total
Benign	70	3	73
Malignant	0	31	31
Total	70	34	104

DISCUSSION:

The use of triple test which includes clinical examination, mammography and cytology is now being routinely used in the evaluation of breast lumps. The present study is of 105 cases of breast neoplasms, all of which were evaluated by clinical examination and fine needle aspiration cytology (FNAC). The age range in the present study was from 14-85 years. The maximum number of neoplasms were seen in the age group of 21-30 years (27.61%). Kocaay AF et al compared fine needle aspiration cytology (FNAC) with core biopsy in histopathologic diagnosis of palpable breast masses. Data were collected on 123 women who have suspicious palpable breast masses from 2007 to 2010. Of the 123 patients, core biopsies were performed on 64 patients (Group 1) and FNAC on 59 patients (Group 2). Malignancy was confirmed in 25 out of 32 clinically suspicious patients in Group 1 (78.1%), and 20 out of 21 participants in Group 2 (95.2%). Among the clinically suspicious patients, 81.8% of 33 patients in Group 1, and 90.3% of 31 patients in Group 2 were identified malignancy. Sensitivity was 100% for core biopsy and 95% for FNAC. Specificity was 100% in both procedures. False negativity rate in FNAC were 5%. They concluded that sensitivity and specificity showed that in the case of true histopathologic classification, core biopsy is superior to FNAC. Nevertheless, FNAC's role as a fast, simple and cheap diagnosis cannot be ignored. It is an effective diagnostic tool in most patients, in comparison to the correct and specific typing of core biopsies in benign lesions which protect patients from the open biopsy. Chandanwale SS et al studied to look the frequency distribution of various breast lesions on fine needle aspiration (FNA). The 902 patients who presented with palpable breast lump, irrespective of age and sex were included in the study. Frequency distribution of various breast lesions with respect to age and sex was studied. Cytology grading in breast carcinoma was correlated in 69 cases with histology grading. The majority (N = 871) of patients were females with maximum (N = 566) patients between second and third decade. The 773 patients had benign breast lesions and maximum (N = 341) patients were in the second decade. Fibroadenoma was the commonest benign lesion followed by fibrocystic change and mastitis. Out of 119 malignant breast lesions, 31.93% [N = 38] were between 41-50 years of age, 28.57% [N = 34] in 51-60 years and 22.68% [N = 27] in between 31-40 years of age. Out of 119 malignant breast lumps and majority were infiltrating ductal carcinoma (N = 108). Cytology grading correlated maximum with histology grade in Grade I followed by Grade II and Grade III. With experienced hands, FNA is safe, cost effective and a reliable technique for preoperative evaluation of palpable breast lumps. FNA features are more informative when combined with physical and radiology findings (Triple test). Fibroadenoma, fibrocystic change and mastitis form the major bulk of benign breast lesions. Epithelioid cells when seen in inflammatory breast FNA smears, tuberculosis must be ruled out. In India, breast carcinoma arises in younger patients as compared to western countries. Grading of breast carcinomas must be done on FNA smears for selecting neoadjuvent therapy. Clinical breast examination and mammography screening in females should be encouraged in developing countries from the third decade onwards for early detection of breast carcinoma. [7, 8]

Bukhari MH et al designed study to see the role of fine needle aspiration cytology (FNAC) in palpable breast lumps. Four hundred and twenty five (425) patients came to the Department of Pathology King Edward Medical University, Lahore in four years for FNAC of their palpable breast masses from June 2006 to June 2010. FNAC diagnosis was compared with histological diagnosis to see the accuracy of fine needle aspiration cytology for neoplastic lesions. There were 271/425 benign, 120/425 malignant, and 32/425 suspicious smears. Inadequate samples were repeated twice or thrice, and the degree of success was improved with consecutive repeating approaches. The frequency of inadequacy declined from 86 to 18, and 2 for first, second and third attempts, respectively. The number of repeats increased the diagnostic accuracy of aspirates which is statistically significant. Invasive ductal carcinoma was the most commonly reported lesion with maximum incidence in the 4th, 5th, and 6th decades followed by invasive lobular carcinoma and other malignant lesions. The sensitivity, specificity, accuracy, negative predictive value, and the positive predictive value of FNAC was 98%, 100%, 98%, 100%, and 97%, respectively. They concluded that FNAC serves as a rapid, economical, and reliable tool for the diagnosis of palpable breast lesions because the cytopathological examination of these lesions before operation or treatment serves as an important diagnostic modality.

Saha A et al compared between Fine Needle Aspiration Cytology (FNAC) and Core Needle Biopsy (CNB) in the diagnosis of breast carcinoma with final histological diagnosis from excision specimen as it is gold standard. A prospective study was done on 50 cases. Patients undergoing all three procedures (Fine Needle Aspiration Cytology and Core Needle Biopsy done at Department of Pathology; subsequent excision surgeries done at Department of General Surgery) were selected. May Grunwald Giemsa (MGG) and Papaniculou (PAP) staining were performed on cytology smears. Haematoxylin and Eosin (H&E) staining was done on both the CNB and tissue specimens obtained from subsequent excision surgeries to see the histological features. FNAC showed sensitivity, specificity, positive predictive value, negative predictive value, and diagnostic accuracy were 69%, 100%, 100%, 38.1%, and 74% respectively in diagnosing carcinoma. CNB had sensitivity, specificity, positive predictive value, negative predictive value, and diagnostic accuracy of 88.3%, 100%, 100%, 53.3% and 86%. Both FNAC and CNB showed statistically significant correlation with confirmatory HPE of excision specimen (p-value <0.05) in the diagnosis of breast carcinoma. It was concluded that fine needle aspiration cytology (FNAC) is a rapid, less complicated, economical, reliable and relevant method for the preoperative pathological diagnosis of breast carcinoma in a developing nation like ours. If the initial FNAC is inadequate, core needle biopsy (CNB) can be a useful second line method of pathological diagnosis in order to minimize the chance of missed diagnosis of breast cancer.[9, 10]

CONCLUSION:

Within the limitations of the present study, it can be concluded that benign neoplasms of the breast are more common than malignant ones. FNAC is a very effective diagnostic aid and is easy and safe to perform. In cases where FNAC is inconclusive or when the clinician has a suspicion of biopsy it is always advisable to go for a biopsy or mastectomy. A cytopathologist should always take utmost care while reporting and whenever in doubt a biopsy should be suggested to avoid false diagnosis.

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