

Fine Needle Aspiration Cytology (FNAC): An Effective, Less Invasive Preoperative Diagnostic Technique for Breast Lesions

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Abstract

Background /Introduction: With the increasing incidence of breast cancer, the need for minimally invasive, prompt, cost effective and definitive preoperative assessment of breast lesions using fine needle aspiration cytology (FNAC) may be explored, especially in a developing country. The study was out to classify a broad spectrum of breast lesions diagnosed using FNAC, to determine the prevalence and highlight the efficacy of FNAC in breast lesion diagnosis. **Materials and Methods:** One hundred and thirty one (131) patients who presented to the Histopathology department of Chukwuemeka Odumegwu Ojukwu University Teaching Hospital, Awka, from 2014 to December 2019 were utilized for this study. Patients' data and investigation reports were retrieved from the hospital records and laboratory report register. Ethical approval for the study was obtained from the ethics committee of COOUTH, Awka (Ref number: COOUTH/CMAC/ETH.C/VOL 1/FN: 04/0063). **Results:** The study revealed that seven males (5.4%) and 124 (94.7%) females, with a mean age of 45years presented within the time frame. Benign and malignant lesions accounted for 41.2% (54) and 38.9% (51) respectively, of the total population while inflammatory lesions, ductal carcinoma, Lymphadenitis, chronic abscess and fibro-adenoma accounted for 16.72% (22). Four cases (3.1%) fell into the category of insufficient cells for cytological analysis (C1). Seventy four patients (56.5%) presented with right breast lumps, 48(36.6%) left breast, while 9 (6.9%) presented with lumps on both breasts. Patient with age range of 51-60 years had most frequent malignant cases. Besides, varying clinical presentation of the lumps was observed. **Conclusions and Recommendations:** Definite diagnosis of malignant breast lesions using FNAC could suggest efficacy, reliability and acceptability of the technique for definitive and early breast lesions diagnosis. Therefore, to enhance early and definitive diagnosis of breast lesions, which is a key factor in management and event free survival rate, FNAC; a less invasive, patients' acceptable diagnosis technique is advocated.

Keywords: FNAC- Breast- Lesions- Diagnosis

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Introduction

Accurate preoperative diagnosis of a breast tumour is essential for optimal treatment planning. To avoid unnecessary patient distress, it is important to achieve a definite diagnosis without delay and with minimal biopsies. Thus, cost-effective means of breast cancer diagnosis are crucial [1]. Breast cancer is the leading

female malignancy in the world and is now the most common cancer in Nigeria [2]. Breast lump is a very common problem in the surgical units of many hospitals and the major concern of the surgeon as well as the responsibility of the surgical pathologist lie in the ability to differentiate a benign lesion from a malignant lesion

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[3]. Although histopathological diagnosis is a universally accepted confirmatory mode of diagnosis and follows up, fine needle aspiration cytology (FNAC) of breast lumps is an important part of triple assessment of palpable breast lumps. Sometimes it is difficult to determine from simple clinical examination whether a suspicious lump is benign or malignant, therefore, a method of definitive diagnosis of patients who present with breast lumps at the outpatient clinic is needed [4]. FNAC is simple, easy to perform, reproducible, acceptable to the patient, can be carried out in a busy clinic setting, and does not require too much preparation or expensive equipment, cost effective, with minimal physical and psychological trauma and with little or no complications [5]. Although, open surgical biopsy is the 'gold standard' for diagnosis of palpable breast lesions, in resource poor settings like Nigeria with unique sociocultural and economic peculiarities, fine needle aspiration cytology (FNAC) comes readily useful for its obvious advantages. This study therefore aimed at assessing the effectiveness of FNAC in the diagnosis of benign and malignant breast diseases.

Materials and Methods

This was a 5-year retrospective analysis of all breast tumours diagnosed at the Pathology Department of Chukwuemeka Odumegwu Ojukwu University Teaching Hospital (COOUTH), Awka from January 1, 2014 to December 31, 2019. Ethical clearance was obtained from the ethics committee of the hospital before commencement of the study. Records of patients with breast tumours; both malignant and benign were retrieved from the pathology registers and request forms. Information such as age, sex, site of lump, clinical as well as diagnosis using FNAC was retrieved from the patient records. Data obtained from the study was analyzed using Microsoft Excel 2016. A total of one hundred and thirty one (131) data were successfully retrieved for the study.

The documented cytological diagnoses were categorized into one of five diagnostic categories in accordance with the recommendations of the United Kingdom National Health Services Breast Screening Programme (NHSBSP). The cases were reported using a modification of the NHB reporting criteria as reported by Ibikunle et al., [6] as follows:

- C 1 - Insufficient cells for cytological analysis, i.e. fewer than five epithelial cell groups
- C2 - Cells present all benign; no suspicious features
- C3 - Cells suspicious but probably benign
- C4 - Cells suspicious but probably malignant and
- C5 – Definitely malignant.

Results

Out of the 131 cases examined, seven (7) (5.3%) were males while 124 (94.7%) were females, giving a male to female ratio of 1:18. The ages of these patients ranged from 18-84 years old with the mean age of 45.4 years. The age range of male patients was 28-80 years while that of the females was 18-84 years with mean ages of 51 years

Table 1. Demographic Characteristics of the Subjects (n = 131)

Variable	Frequency	Percentage (%)	
Age Group	<21 years	6	4.6
	21-30 years	21	16
	31-40 years	30	22.9
	41-50 years	19	14.5
	51-60 years	26	19.8
	61-70 years	21	16
	>70 years	8	8.4
Gender	Male	7	5.3
	Female	124	94.7
Lump site	Right	74	56.5
	Left	48	36.6
	Both	9	6.9

and 45 years respectively. Most of the female patients were within the 3rd and 5th decades of life (31-40 and 51-60 years respectively). Seventy-four (56.5%) patients presented with lumps at the right breast, 48(36.6%) presented at the left breast while 9 (6.9%) presented with lumps at both the right and left breasts (Table 1).

A total of 51 (38.9%) and 54 (41.2%) were diagnosed with C5 (malignant) and C2 (benign) respectively, while inflammatory lesions, ductal carcinoma, Lymphadenitis, chronic abscess and fibro-adenoma accounted for 16.72% (22). Four cases (3.1%) fell into the category of insufficient cells for cytological analysis (C1). The age range 51-60 years had the most frequent malignant cases 14 (13.5%) (Table 2).

Clinical data showed that 28 (21.4%) of the patients reported with varied types of mass, ranging from firm, mobile, recurrent, painful, palpable mass. Out of the 28 patients who presented with varied forms of breast lumps, 17 occurred at the left breast while 11 was at the right side. Twenty two (78.57%) were diagnosed to be malignant lesions, 5 (17.86%) benign lesions and 1 (3.57%) as lymphadenitis. Eight patients reportedly presented at the hospital with some forms of breast discharge, with five being bloody discharge; 4 were diagnosed with a benign lesion (2 as C3 and 3 as C2) while the remaining were diagnosed as inflammatory lesions. Besides these, 19 (14.5%) presented with breast swelling (47.4% and 52.6%, on the right and left breasts respectively). Using FNAC, 15.7% and 57.9% of the patients with breast swelling were diagnosed of malignant and benign lesions respectively, while the rest were diagnosed were inflammation 15.7% and chronic abscess (5.3%).

Discussion

The higher frequency of females in the total records of breast diseases in this study shows that breast diseases are mostly diagnosed in females and occasionally in males, and this is in line with previous studies as recorded by Ssemmanda et al., [7]. The higher mean age of males compared to female subjects suggests that male breast

Table 2. Frequency of Classification of Breast Lesion in Relation to Age Group (n = 104)

Age-group (years)	NHB Classification (%)				
	C1	C2	C3	C4	C5
<21	1 (1.0)	4 (3.8)	1 (1.0)	0 (0)	0 (0)
21-30	0 (0)	7 (6.7)	3 (2.4)	0 (0)	5 (4.8)
31-40	0 (0)	14 (13.5)	1 (1.0)	1 (1.0)	7(6.7)
41-50	0 (0)	5 (4.8)	1 (1.0)	5 (4.8)	1 (1.0)
51-60	0 (0)	6 (5.8)	0 (0)	3 (2.4)	14 (13.5)
61-70	0 (0)	7 (6.7)	3 (2.4)	0 (0)	7 (6.7)
>70	0 (0)	3 (2.4)	0 (0)	3 (2.4)	5 (4.8)
Total	1 (1.0)	46 (44.2)	9 (8.7)	12 (11.5)	36 (34.6)

disease presents later in life and this is also in congruence with the findings of Anderson et al., [8]. Having the majority of the breast lesions presenting on the right breast is contrary to the findings of Elmadhoun et al., [4] who found more of the breast lesions occurring on the left breast but agrees with the findings of Dauda et al., [9]. This suggests that breast disease can equally present on either breast. These differences have been reported by different researchers and may not have any pathological significance.

In this study, the prevalence of malignant breast lesions diagnosed by FNAC is on the increase compared to previous studies as reported by Elmadhoun et al., [4]. This increase may be explained by increased urbanization and lifestyle changes. Majority of patients with malignant breast lesions were between the age ranges of 31-60 years with mean age of 53. It was found that they were older than that reported in other countries like 48 years in Saudi Arabia [10] and 49 years in Israel [11]. The older age at presentation of malignant breast disease in this study may be explained by poor breast cancer awareness and screening programs.

The varied presentations of the various breast lesions in this study which includes firm, mobile, recurrent, painful, palpable mass, nipple discharge, and breast swelling were not suggestive of the eventual diagnosis of the lesion.

Owing to the increase in diagnosis of malignant breast lesions using FNAC and late presentation of patients with malignant breast lesions to the hospital, FNAC is therefore a useful tool which can be used in a resource poor setting for quick diagnosis of breast lesions in a busy hospital clinic to enhance timely intervention.

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References

- Siddique R, Sinha A, Adhikary M, Phukan JP. Comparative Study of Fine-Needle Aspiration Cytology and Needle Core Biopsy in the Diagnosis of Breast Lumps with Histopathological Correlation. *Journal of the Scientific Society*. 2022 04;49(1):70. https://doi.org/10.4103/jss.jss_81_21
- Azubuikwe SO, Muirhead C, Hayes L, McNally R. Rising global burden of breast cancer: the case of sub-Saharan Africa (with emphasis on Nigeria) and implications for regional development: a review. *World Journal of Surgical Oncology*. 2018 03 22;16(1):63. <https://doi.org/10.1186/s12957-018-1345-2>
- Egwuonwu OA, Anyanwu SNC, Chianakwana GU, Ihekwoaba EC. Breast Lumps in NAUTH, Nnewi :A 5 year Review. *Nigerian Journal of Surgery*. 2009;15(1-2):6-9. <https://doi.org/10.4314/njs.v15i1-2.70777>
- Elmadhoun WM, Almobarak AO, Ibrahim AM, Bushara S, Noor SK, Husain NEOS, Ahmed MH. Cytomorphology of palpable breast lesions: Diagnostic utility of FNAC in a developing country. *Diagnostic Cytopathology*. 2015 Oct;43(10):825-829. <https://doi.org/10.1002/dc.23320>
- Ogbuanya AU, C Anyanwu SN, Nwigwe GC, Iyare FE. Diagnostic accuracy of fine needle aspiration cytology for palpable breast lumps in a Nigerian teaching hospital. *Nigerian Journal of Clinical Practice*. 2021 01;24(1):69-74. https://doi.org/10.4103/njcp.njcp_540_19
- Ibikunle DE, Omotayo JA, Ariyibi OO. Fine needle aspiration cytology of breast lumps with histopathologic correlation in Owo, Ondo State, Nigeria: a five-year review. *Ghana Medical Journal*. 2017 03;51(1):1-5. <https://doi.org/10.4314/gmj.v51i1.1>
- Ssemmanda S, Katagirya E, Bukirwa P, Alele D, Lukande R, Kalungi S. Breast diseases histologically diagnosed at a tertiary facility in Uganda (2005-2014). *BMC cancer*. 2018 Dec 22;18(1):1285. <https://doi.org/10.1186/s12885-018-5208-6>
- Anderson WF, Jatoi I, Tse J, Rosenberg PS. Male breast cancer: a population-based comparison with female breast cancer. *Journal of Clinical Oncology: Official Journal of the American Society of Clinical Oncology*. 2010 01 10;28(2):232-239. <https://doi.org/10.1200/JCO.2009.23.8162>
- Dauda AM, Misauno MA, Ojo EO. Histopathological types of breast cancer in Gombe, North Eastern Nigeria: a seven-year review. *African Journal of Reproductive Health*. 2011 03;15(1):109-111.
- Jamal AA. Pattern of breast diseases in a teaching hospital in Jeddah, Saudi Arabia. *Saudi Medical Journal*. 2001 02;22(2):110-113.

11. Aghassi-Ippen M, Green MS, Shohat T. Familial risk factors for breast cancer among Arab women in Israel. *European journal of cancer prevention: the official journal of the European Cancer Prevention Organisation (ECP)*. 2002 08;11(4):327-331. <https://doi.org/10.1097/00008469-200208000-00003>



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