

Original Article

Cytopathology practice in Lagos, Nigeria: our experience.

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ABSTRACT

Background: Fine Needle Aspiration (FNAC) is a simple cost effective and rapid diagnostic technique. It is used in addition with exfoliative/fluid cytology to help clinicians in the management of patients who present with abnormal masses in the body. This study is to present our experience of FNAC and non gynaecological cytology (NGC) in diagnostic cytopathology and highlight the varieties of samples for cytopathology analysis.

Materials and Methods: This is a six year retrospective study of all FNAC and NGC specimen seen in Lagos State University Teaching Hospital, Ikeja and Lag Path Consulting laboratory, Ikeja, Lagos State between January 2008 and December 2013. All cytopathology reports and records were retrieved and analyzed using the Statistical Package for the Social Sciences version 20. Test for statistical significance was set at $p < 0.05$.

Results: A total of 1855 patients were seen during this period with a male female ratio of 1:3 and a mean age of 40.61 ± 17.49 years. Breast FNAC was the most common request seen (37.4%) which was followed by fluid cytology (28%) and then thyroid (12.7%), soft tissues (10.2%) and lymph nodes (9.2%). FNAC breast, lymph node and soft tissues showed 29.5%, 22.2% and 8.9% malignancy rate respectively. Fluid cytology requests were seen more in extreme of ages.

Conclusion: FNAC of breast lumps, fluid/exfoliative cytology and thyroid enlargement are the most common specimens seen. Breast lump aspirates showed the highest malignant diagnosis. With continued use of this investigation, training and retraining of pathologists and clinicians in cytopathology is advocated for better result.

Keywords: Fine needle aspiration, exfoliative cytology, cytopathology.

INTRODUCTION

Fine needle aspiration cytology (FNAC) is a simple, cost effective and rapid diagnostic technique. Due to the early availability of results, its simplicity, minimal trauma and absence of complications, the aspiration cytology is now considered a valuable diagnostic aid especially in resource Low Countries like Nigeria. The cytomorphological features collaborate with histopathology and have qualities of a micro-biopsy especially in the hands of experienced cytopathologist.¹

The main goal is to help clinicians in the management of patients who present with abnormal masses. Knowing beforehand if a lesion is likely to be benign or malignant will aid in

planning for surgery or other therapies.²FNAC is cheap, minimally invasive and has no or fewer risks and complications. It has become one of the commonly requested procedures by clinicians.³A rapid diagnostic procedure like FNAC is important in our setting where most cases of patients with malignant tumour present in advanced stage and need not to join the long awaiting queue for biopsy. FNA is an important tool in the practice of clinical cytology all over the world and is increasingly in use as complementary/supplementary and even a substitute to histology. It is used extensively for the diagnosis of neoplastic and non neoplastic conditions of superficial organs, such as the breast,

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thyroid, salivary glands, and lymph nodes as well as deep seated space occupying lesions in the body cavities.⁴

Fluid (exfoliative) cytology on the other hand is equally important in diagnosing tumors especially when the tumour it bathes is not readily accessible.⁵ Fluid cytology includes both internal fluids like peritoneal, ascitic fluid and external fluids like urine and sputum. Benefits of fluid cytology in diagnosis of cancers cannot be overemphasized in the planning of the management of the patients.

Lagos State University Teaching Hospital (LASUTH),Ikeja is the only Lagos State owned tertiary health institution and it has one of the largest pathology laboratories in the State. Before 2008, FNACs were sparingly utilized for diagnosis of cancers in LASUTH and the few that were done, were performed by the surgeons with little or no experience in the performance aspiration for cytological diagnosis. This accounted in most of the aspirated materials unsatisfactory for cytopathology assessment and diagnosis resulting in unpopularity of FNAC procedure as an effective diagnostic technique-. However from 2008, FNAC was subsequently taken over by the Pathologists who manage the cytology clinic and perform aspirations. This had led to better tissue yield and satisfactory results, making FNAC a cost effective diagnostic procedure. This has led to its improved acceptability in the management of patients in the hospital

This study is to present our experience in the utility of FNA and NGC in diagnostic pathology, highlight the variety of samples for cytopathology analysis.

MATERIALS AND METHODS

This is a six year retrospective study of all FNA and fluid cytologic specimens received in Lagos State Teaching Hospital, Ikeja and Lag Path Consulting laboratories (a private medical diagnostic laboratory located in Ikeja) between

January 2008 and December 2013. The pathology laboratory in LASUTH serves the teaching hospital and over thirty General Hospitals serving a population of over 15million people in Lagos State. The laboratory also serves as a referral centre to patients from the contiguous states. Lag Path Consulting serves mainly the private hospitals in the area and its immediate environs. The FNA samples were taken directly by the Pathologists in these laboratories. The FNAC to be performed by the Pathologists was initially discussed with the clinicians to allay their fears and seek their approval and cooperation for this very important investigation. A meeting was also held with the members of the Association of General and Private Medical Practitioners of Nigeria during their monthly meeting.

The FNAC clinic was initially planned to be moved to the consulting rooms, but because of the number of Pathologists on ground, it was agreed that the FNAC clinic be located in the pathology department. The clinic days were fixed for Tuesdays and Thursdays between 9:00am and 1:00pm. LagPath Consulting, the private laboratory fixed its own FNAC clinic on weekdays between 4:00pm and 6:00pm. The aspiration was done by the Pathologists in the laboratory while those with inadequate sample were re-aspirated. Fluid/exfoliative cytology specimens on the other hand were received in these two laboratories as soon as they were taken; it was advised that the sample should get to the laboratory within two hours of collection. This is because there is a possibility of quality loss of specimens, if it was left unattended for a period of time. The laboratory scientist on the other hand ensured the smears are made within 10 minutes of receiving such sample.

A 23 or 25G needle was used to aspirate masses felt after macroscopic description. Two sets of slides were made from the aspirate taken on every occasion, the first set was fixed in absolute alcohol and the second set Air dried. The fluid cytology specimens which were always advised to get to the laboratories within one hour of collection of the specimen were also made into these two sets of

slides. The alcohol fixed slides were stained in Papanicolaou stain and the air dried slides were stained with MGG stains. The few intra-abdominal masses aspirated were done under ultrasound scan within the Radiology department in LASUTH. All the slides were read by the pathologists and the diagnoses were based on the internationally accepted classed diagnosis. The records of all non-gynaecological cytologic smears were retrieved and the slides were re-evaluated. Clinical details including the age, gender, type of cytologic specimen were retrieved from the request forms.

RESULTS

A total of 1,855 patients were seen during the period under review comprising of 462 (24.9%) males and 1,393 (75.1%) females giving a male to female ratio of 1: 3. The mean age of the patients was 40.61 ± 17.49 years with the median of 40 years, with ages range from 0 -100 years. The peak age group was 31-40 years with prevalence value of 447 (24.1%) followed by 41-50 years 360 (19.4%) while the least groups were 0-10 and above 70 years with 4% each. (Table i).

Breast FNAC 693 (37.4%) was the most common cytology requests seen during the period of the study This was followed by fluid cytology 519 (28%). FNAC of Thyroid and Soft tissue constituted 235 (12.7%) and 190 (10.2%) of the requests respectively. Whilst Salivary/Parotid glands were the least recorded values in proportions of 37 (2.0%) (Table i)

Table 1: Demographic profile

Variable	Number	(percentage)
Gender		
Male	462	(24.9%)
Female	1,393	(75.1%)
Age category		
0-10	74	(4.0)
11-20	140	(7.5)
21-30	309	(16.7)
31-40	447	(24.1)
41-50	360	(19.4)
51-60	206	(11.1)
61-70	207	(11.2)
Above 70	74	(4.0)
Not Stated	38	(2.0)
Specimen sites		
Breast	693	(37.4)
Fluid cytology	519	(28.0)
Lymph node	171	(9.2)
Parotid	37	(2.0)
Soft tissue	190	(10.2)
Thyroid	235	(12.7)
Others	10	(0.5)

Table 2: Specimen site with Age Category

Specimen	Age category (years)									Total
	0-10	11 - 20	21 - 30	31 - 40	41 - 50	51 - 60	61 - 70	Above 70	Not Stated	
Breast	2	46	151	195	154	65	55	12	13	693
% Age	2.7%	32.9%	48.9%	43.6%	42.8%	31.6%	26.6%	16.2%	34.2%	37.4%
Fluid cytology	27	34	69	105	85	64	83	33	19	519
% Age	36.5%	24.3%	22.3%	23.5%	23.6%	31.1%	40.1%	44.6%	50.0%	28.0%
Lymph node	24	19	36	29	22	15	17	7	2	171
% Age	34.4%	13.6%	11.7%	6.5%	6.1%	7.3%	8.2%	9.5%	5.3%	9.2%
Parotid	1	4	8	9	7	4	3	1	-	37
% Age	1.4%	2.9%	2.6%	2.0%	1.9%	1.9%	1.4%	1.4%	-	2.0%
Soft tissue	13	28	24	44	36	16	14	12	3	190
% Age	17.6%	20.0%	7.8%	9.8%	10.0%	7.8%	6.8%	16.2%	7.9%	10.2%
Thyroid	5	8	20	64	55	41	32	9	1	235
% Age	6.8%	5.7%	6.5%	14.3%	15.3%	19.9%	15.5%	12.2%	2.6%	12.7%
Others	2	1	1	1	1	1	3	-	-	10
% Age	2.7%	0.7%	0.3%	0.2%	0.3%	0.5%	1.4%	-	-	0.5%
Total	74	140	309	447	360	206	207	74	38	1855
% Age	(100%)	(100%)	(100%)	(100%)	(100%)	(100%)	(100%)	(100%)	(100%)	(100%)

P = 0.025

Table 2 shows fluid cytology and lymph node FNAC making the most common indication for cytology in the age group 0-10 years representing 36.5% and 34.4% respectively. Breast cytology recorded the highest request for cytology between the 11 and 60 year age groups ranging from 48.9% to 31.6% within each decade. For groups 61-70 year, above 70 and the group with unknown age, fluid cytology recorded the highest request for cytology with a frequency of 40.1%, 44.6% and 50.0% respectively.

Almost all requests have their peaks at 31-40 years indicating the peak of cytologic investigation use.

Fluid cytology is the most common indication for cytology among males followed by soft tissue cytology. Among females, breast cytology recorded the highest value followed by fluid cytology. We also found out a female preponderance in the cytology of the breast, thyroid and fluid cytology accounting for 97.1%, 76.6% and 64.7% respectively. For other types of cytology, lymph nodes, parotid glands and soft tissue samples, there were no significant gender differences.

The benign diagnoses range between 50.5% and 92.3% from the different samples while the unsatisfactory result was between 3.4% and 18.1%.

Figure 1: Graph of cytology frequency in relation with age group

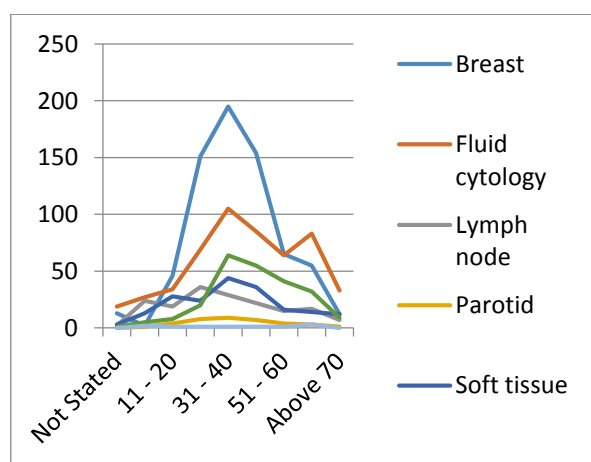


Table 3: Specimen site in comparison with gender

Specimen site	Gender		
	Male	Female	Total
Breast	20 (2.9%)	673 (97.1%)	693 (100%)
Fluid cytology	183 (35.3%)	336 (64.7%)	519 (100%)
Lymph node	85 (49.7%)	86 (50.3%)	171 (100%)
Parotid	17 (45.9%)	20 (54.1%)	37 (100%)
Soft tissue	96 (50.5%)	94 (49.5%)	190 (100%)
Thyroid	55 (23.4%)	180 (76.6%)	235 (100%)
Others	6 (60%)	4 (40%)	10 (100%)
Total	462 (24.9%)	1393 (75.1%)	1855 (100.0%)

P < 0.001

Table 4: Results of the different samples

	Breast	Lymph Node	Fluid cytology	Soft Tissue	Thyroid gland
Benign	359(50.5%)	117 (68.4%)	368 (70.9%)	150(78.9%)	217 (92.3%)
Malignant	205(29.5%)	38 (22.2%)	38 (7.3%)	17(8.9%)	4 (1.7%)
Suspicious	60(8.6%)	7 (4.1%)	19 (3.7%)	14(7.4%)	6 (2.6%)
Unsatisfactory	71(10.4%)	9 (5.3%)	91 (18.1%)	9 (4.7%)	8 (3.4%)

DISCUSSION

The FNAC clinic was established in LASUTH in 2008 after a period of trial by some interested surgeons with the acceptability and report outcome from the pre 2008 results which were not encouraging. In a Benin study by Obaseki, reported that many surgeons show initial apathy to FNAC especially on the basis of on doubts about the reliability of the test result.⁶Gomez-Macias et al recommended that FNAB be performed preferably by Pathologists who have received training in this technique.⁷Carson et al reported a significant difference in the percentage of inadequate material for interpretation of cases between clinicians (14%) and Pathologists (3%)⁸; a view corroborated by Al Marzooq et al who showed Surgeons (29.5%) as against Pathologists (4.6%).⁹

The male to female ratio in this study was 1:3 which showed that more females undertake this investigation. This is believed to be as a result of female breast cancer being the most common cancer in this part of the country¹⁰ and early management which includes the use of FNAC has now been embraced by clinicians, because of the cost effectiveness of FNAC in its management. Up to 97% of cases of breast FNAC were done in females. We also believed that increased awareness of breast self-examination campaign across the country might have added to the improvement in the utility of FNAC.

Among the specimen sites, breast FNAC is the most common site, followed by fluid cytology and then thyroid and soft tissue FNACs. In many research papers in cytopathology, fluid cytology was not included on papers on FNACs, and the first four common specimen sites amongst FNAC in this study are FNAC breast, thyroid, soft tissues and lymph nodes in that order. Thomas et al in Ibadan showed the highest sites for FNACs as including breasts(39.2%), lymph nodes (24.3%) and thyroid glands(19.0%).¹¹In Benin, the frequent sites being breast lumps, superficial lymph nodes, thyroid glands and salivary glands.⁶

In a Cameroonian Missionary Hospital, the most frequently reported sites in cytological investigation are the head and neck regions, breast, intra-abdominal mass, lymph nodes and exfoliative cytology¹² while in a study in Mexico the organ sites with the greatest FNAB include breast followed by lymph nodes, soft tissues, thyroid glands and deep organs.⁷The difference in the frequency from country to country might largely be due to variation in the availability of ancillary equipment to access deeper regions rather than difference in organ distribution of tumour. Amongst the children in the first decade of life, the most common request for cytologic investigation was fluid cytology, followed by lymph node enlargement and then soft tissue tumours. Breast FNAC was the most common indication for

cytology request from the 2nd to the 6th decade of life.

Fluid (exfoliative) cytology was the most frequent request of this investigation in the 7th decade and above. The peak age group use for cytology is the 31-40year age group for all specimens for FNAC and exfoliative cytology.

The female patients were the most prevalent in the breast and fluid cytology cases as well as thyroid enlargement, and this reflect the female preponderance for tumours in breast and thyroid organs^{13,14}.

Thyroid glands FNAC recorded the lowest malignant diagnosis which reflects the low level of malignancy seen in thyroid in our environment.¹⁴ Breast lumps showed about 30% of the patients diagnosed as malignant. The few cases that had histologic confirmation done showed good concordance, but the little number of cases with histology diagnosis is a limitation to determining the specificity and sensitivity of diagnoses made. The high rate of unsatisfactory and suspicious result we believe will improve with further training of pathologists and clinicians in the aspiration and reporting of the samples. Duduyemi et al in their study concluded that poor requests from referring clinicians, varied sampling techniques by pathologists and biomedical scientists may account for the high rate of non-diagnostic cases and that histology and cytopathology correlation may be necessary to reduce the high rate of non-diagnostic cases and to ascertain unclear cases.¹⁵

The specimens classified as others include few intra-abdominal cytology that was done for renal, ovarian and liver tumours, and these were done under ultrasound guidance with the Radiologists. The yield was adequate and diagnoses were made with some of them having histological concurrence.

CONCLUSION

FNAC of the breast, fluid/exfoliative cytology and thyroid enlargement were the major specimens seen

in our practice. Cytological investigations are more utilized by females especially in their reproductive age group. Breast lump aspirates showed the highest malignant diagnosis. There is need for regular training and retraining of pathologists and clinicians for improved results. It is believed with the proper use of this procedure will ensure prompt treatment and thus reduce attendant morbidity and mortality of many diseases.

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