

RESEARCH ARTICLE

Cytomorphologic Patterns of Breast Lesions in Sudanese Patients: Lessons Learned from Fine Needle Aspiration Cytology

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Abstract

Background: Cytology for breast lesions is a safe, rapid and cost-effective with a high specificity and sensitivity. **Objective:** To determine the cytomorphologic patterns of breast lesions identified among a group of Sudanese patients. **Materials and Methods:** This study included 759 patients undergoing either a fine needle aspiration FNA, nipple discharge (ND) smears or breast skin scraping (SS) at a cytology clinic in Khartoum. Clinical and demographic data were reviewed. Stained smears were categorized into: inadequate sample, normal breast, benign lesion, suspicious, or malignant neoplasm. **Results:** Of the 759 cases, 734 (96.71%) were FNA, 18 (2.37%) ND and 7 cases (0.92%) SS. For 28 cases, FNA was done under ultrasound guidance. Females were 720 (94.86%). Benign lesions were 423 (55.75%) and 248 (32.67%) were malignant and 77 (10.14%) of smears were normal without any detected abnormality. Ten (1.31%) cases were suspicious for malignancy, and only one case (0.13%) was reported as inadequate. Most lesions were observed among the age group 30 years and above. **Conclusions:** Most patients investigated have benign lesions, one third of cytological smears were malignant. FNAC is a useful tool for investigating breast lesions in limited-resource settings.

Keywords: Breast - cytomorphology - fine needle aspiration cytology - Sudan

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Introduction

Cytology can explore breast lesions in three distinct ways, Fine Needle aspiration cytology (FNAC), scraping of skin (SS), and smearing of nipple discharge (ND) (Cochrane et al., 1997). FNAC of breast lumps is an important part of triple assessment (the other two are clinical examination and mammography) of palpable breast lumps (Willems et al., 2012). It is an accurate, rapid, easy to perform, cost-effective and reproducible diagnostic tool (Ahmed et al., 2009; Saleh et al., 2012; Wang et al., 2012; Kochhar et al., 2013). FNAC has sensitivity ranging from 84% to 97.5% and specificity of 99% to 100% for breast lesions (Ogunniyi et al., 1989; Alatisse et al., 2006; Nggada et al., 2007; Ahmed et al., 2009; Abdel-Hadi et al., 2010).

The objective of the present study was to determine the cytomorphologic patterns of breast lesions which were diagnosed by FNAC of 759 Sudanese patients attending a cytology clinic in Khartoum from January

2009 to December 2010.

Materials and Methods

Smears from 759 patients, in addition to their clinical and demographic data were retrieved from the records. Diagnosis was established by two cytopathologists and the diagnostic categories were: inadequate, normal, benign, suspicious for malignancy and malignant.

The main cytomorphologic features used for categorization included: cellularity of smears, cohesiveness, nuclear to cytoplasmic ratio, intactness of cell membrane, size of the nuclei, pleomorphism, shape of the nuclei, condensation of chromatin and prominence of nucleoli. In addition to that, the presence or absence of each of the following was also considered: bare nuclei, myoepithelial cells, inflammatory cells, necrotic material and tumor diathesis,

Data were analyzed by using a computer based Statistical Package and Data Analysis (STATA) program

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SE10. Pearson Chi Square Test were used to test association between variables. Ethical considerations: ethical approval was obtained from ethics committee at University of Medical Science and Technology (UMIST). Both written and verbal consent were obtained from each individuals enrolled on this study.

Results

A total of 759 cases of breast lesions were diagnosed using the following cytological techniques; FNAC for 706 (93.02%) cases, guided FNAC for 28 (3.69%), ND for 18 (2.37%) and SS for 7 (0.92%). Patients consisted of 39 (5.14%) males and 720 (94.86%) females, with an age range of 7 to 86 years, and a mean age of 41.01 years. The diagnostic categories were as follow: 423 (55.86%) were benign lesions, 248 (32.67%) were malignant neoplasms, and 76 (10.01%) proved to be normal breast tissue as detailed in Table 1. The benign lesions constituted the largest number of cases; of them 133 (31.44%) were subcategorized as neoplastic and 289 (68.32%) were non neoplastic lesions. Of the benign neoplastic lesions, 115 (86.46%) cases were fibroadenomas, 7 (5.26%) lipomas, 6 (4.51%) benign phylloides tumor and 5 (3.76%) were papillomas.

Regarding the 289 non neoplastic lesions, 67 (23.18%) were fibroadenosis, 62 (21.45%) acute mastitis, 48 (16.60%) simple benign cyst, 30 (10.38%) Gynecomastia,

26 (9.06%) fibrocystic changes, 21 (7.26%) galactocele, 9 (3.11%) negative nipple discharge for hormonal evaluation, 8 (2.76%) fat necrosis, 6 (2.07%) lactational changes, 3 (1.03%) cases for each of the following: ductectasia, ectopic lymph node and benign ulcer, 2 (0.70%) cases were granulomatous mastitis and only one case (0.34%) was diagnosed as an organized hematoma.

The peak age group for breast lesions was 30 to 39 years comprising 194 (25.56%) of the total, followed by the age group 40 to 49, 169 (22.26%) patients, and those aged 20 to 29, 142 (18.70%) patients. It is clear that the risk of cancer increased with age, as 3 (100%) of those aged 80 years and above were malignant, compared to 105 (51.4%) of patients in the age group 50-59 years (p<0.01) (Table 1). The association between sex, residence and the pattern of breast lesions is displayed in Tables 2 and 3.

Discussion

There has been an increasing use of cytology techniques as diagnostic tools in the preoperative assessment of patients with breast lesions. This is due to high level of awareness among the clinicians of the role of cytology techniques, as a useful diagnostic tool and necessary adjunct to clinical examination. The advantages of these techniques include its low cost, early detection of sinister breast lesions, accuracy and simplicity of the technique (Oluwole et al.,1987). Furthermore, these techniques are well tolerated by patients, and meet their expectations in a timely response to their concerns. The benign lesions of the breast are the most common lesions in the young adults and middle age groups and this reflects the increase in awareness of patients and their desire for early detection and medical care.

Breast cancer is the most common malignancy encountered among women worldwide and in Sudan (Hamad, 2006; Kumle, 2008; Slaoui et al., 1014). In this study, breast cancer represents about one third of all breast lesions investigated, and this finding is consistent with previous cytology reports (Ahmed et al., 2010). Interestingly, malignant breast lesions were seen predominantly seen at the 4th and 5th decade of life and this is in agreement with previous reports (Hemminki et al., 2011; Jack et al., 2012).

This study, endorse the previous observations that there is strong association between breast cancer and both female sex and older age. The increased incidence of malignant lesions noticed in patients coming from outside Khartoum may be explained in part by the referral process of those patients following strong clinical suspicion of malignancy, while benign lesions are dealt with in peripheral centers in district hospitals. Interestingly, patients aged 30 years and older are more likely to be diagnosed as malignant as they represented (96.78%) of the total malignant cases. The incidence of breast cancer in male is estimated to be low and the rate of malignant breast aspirates among males was similar to that reported from India (Kadhel and Multigner, 2014) and higher than that reported from Morocco (Slaoui et al.,1014).

Our study have highlighted several potential benefits of FNA. The most important is that FNA is a simple, safe

Table 1. Distribution of the Diagnostic Category of Breast Cytology According to Age Group (n=759)

Age group	Inadequate	Normal	Benign	Malignant	Suspicious	Total
0-9	-	1	3	-	-	4
10-19	-	1	36	-	-	37
20-29	-	15	118	8	1	142
30-39	-	20	115	57	2	194
40-49	-	25	79	62	3	169
50-59	1	11	39	54	-	105
60-69	-	2	24	38	1	64
70-79	-	1	10	24	3	36
80-89	-	-	-	5	-	3
Total	1	76	424	248	10	759

Table 2. The Relationship between the Diagnosis and Sex of Patient (n=759)

Sex	Cytology report		Total
	Malignant	Non malignant	
Female	243 (33.75%)	477 (66.25%)	720 (100%)
Male	5 (12.82%)	34 (87.18%)	39 (100%)

*p=0.007

Table 3. The Relationship between the Diagnosis and Residence (n=759).

Cytology report	Residence	
	Khartoum	Other States
Malignant	122 (26.58%)	126 (42%)
Non malignant	337 (73.42%)	174 (58%)
Total	459 (60.47%)	300 (39.53%)

*p less than 0.001

and cost effective method as a first line of investigation of palpable breast lumps, particularly in low resource settings. Furthermore, the diagnosis of benign lesions is two folds that of malignant ones, this is an indicator of increased awareness in the community as well as clinicians recognizing the practicability of FNA. Interestingly, 10% of cases being diagnosed as normal breast without any specific pathology may point to “cancer phobia” among our community, an anticipated consequence of raising awareness about breast disease and self-examination.

This study has limitations. The inter-observer subjectivity that exists during interpretation of smears was always considered, and this was reduced by agreement of the cytopathologists on diagnostic cytomorphologic criteria. Recently many authors recommended the use of Core needle biopsy (CNB) as it is considered of significant diagnostic accuracy, correct histology typing, and tumor grading, especially in lesions that are not definitively benign or malignant, non-palpable and/or calcified lesions (Garg et al., 2003; Hukkinen et al., 2008). Therefore, the use of CNB was recommended in the evaluation of breast lumps instead of FNAC (Brancato, 2012). However in low resource setting country like Sudan CNB is not routinely and widely used. Taking all these factors, FNAC usually provides an optimum cellular material to establish diagnosis in addition to the advantages of the lower cost and short turnaround time of results.

In conclusion, this study supports the usefulness of cytomorphological diagnostic techniques in the workout of breast lesions, confirms the predominance of benign breast lesions in the young and the increased malignancy in the 4th decade and above.

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