Accuracy of Fine Needle Aspiration Biopsy (F.N.A.B) in Diagnosis of Breast Lump

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ABSTRACT

Background: Breast cancer is the first one among Iraqi females. Most of them present later for diagnosis. Early detection center in tertiary hospital practice uses FNAB for early diagnosis. Publications on accuracy of this detection are scarce.
Objective: To test the accuracy of FNAB in breast lump diagnosis.
Methods: Diagnostic test accuracy study, on 204 women with breast lump, attending the oncology department in 2017.
Results: Fine-needle aspiration biopsy diagnosis of histologically malignant cases were, malignant in 89 (87.3%), suspicious of malignancy in 5 (4.9%), and benign in 4 (3.9%). Complete sensitivity was 87.3%, and specificity was 100%, with 12.7% false negative results and no false positive cases. The accuracy was 94%.

Conclusion: The study confirmed the high figures of accuracy of FNAB.

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INTRODUCTION

Breast cancer is commonest cancer among women, comprising about 23% of the newly diagnosed cancers among females, and 6 % of all deaths worldwide [1,2].

In Iraq, female incidence rate was 23.01 per 100,000, accounting about 34% of all reported cancer among females [3]. Breast cancer survival rates tend to be poor in developing countries, most likely because of a combination of late diagnosis and limited access to timely and appropriate treatment [4]. Iraqi patients presented at stage II,III, IV.[5] It was explained by low index of the suspicion and use of traditional methods [6].

Breast fine-needle aspiration biopsy (FNAB) of the breast is a minimally invasive diagnostic method, often obviating an open biopsy. [6] Ultrasound guided FNAB has been widely used for non-palpable breast lumps.[7,8] Although core biopsy is preferred to FNAB in most developed countries, its procedure is more expensive and time consuming as compared to FNAB [9].

The clinical use of FNAB has been questioned because of the variation in results [10].

A population based breast cancer screening program is not established in Iraq and only early detection centers, and clinics, were established at tertiary hospitals [12].

Publishing data on the accuracy of FNAB in Iraq is scarce. The situation of screening was the impetus to carry out this study, it is objectives to evaluate the sensitivity, and specificity of FNAB.

Materials and methods

A total of 204 female patients were included in the study. They were recruited from women health centre in Al-Elwyiaa Maternity Teaching Hospital for the period Jan. 2017 – Nov. 2017. All selected women were subjected for FNAB. Histological examination was done after excisional biopsy or mastectomy.

FNAB techniques was carried out according to the suggested Iraqi guidelines [13].

Accuracy of FNAB was done by sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV). The sensitivity and specificity is the proportion of individuals that correctly diagnosed as diseased and non –diseased, respectively. The performance of the FNAB was tested by the PPV, NPV, Sensitivity, and Specificity [14].

RESULTS

Out of the total, 102 (50%) malignant cases, were diagnosed. The age of malignant and benign cases was 50.7(±12.2), and 33.7(±12.4), respectively. There was a significant difference in age between

malignant and benign cases (t=9.834, df=202, P=0.001).

Eighty-nine (87.3%), 5(4.9%), 4(3.9%), were diagnosed as malignant, suspicious of malignancy and benign, respectively (table 1). Out of those benign cases, there were 6 (5.9%), 11(10.8%), and 85(83.3%) as suspicious of malignancy, Atypical probably benign and benign, respectively.

Table 1: The histological (reference) and FNAB (index) tests result presentation

FNA	Histology result Malignant Benign		Total
Malignant	89 (87.3%)	0 (0%)	88 (43.1%)
Suspicious of malignancy	5 (4.9%)	6 (5.9%)	11(5.4%)
Atypical probably	4 (3.9%)	11(10.8%)	16(7.8%)
benign	4(5.6)		89 (43.6%)
Total	120	102	204
X2=166.1, df=3, P= 0.00			

Sensitivity, specificity, PPV and NPV were 87.3%, 100%, 100% and 88.7%, respectively, as shown in table 2.

Table 2: The complete sensitivity and specifity of FNA

FNAB	Histological examination		Total
	Positive	Negative	
Positive	89	0	89
Negative	13	102	115
Total	102	102	204

Sensitivity = 87.3%, Specificity = 100%, PPV = 100%, NPV = 88.7%, Accuracy=94% FP = 0%, FN=12.7%,

DISCUSSION

For a good therapeutic management, there is a need for rapid, inexpensive, and non-invasive test. FNAB is the test of choice for this purpose because of the finer needle size and is easier/safer in certain lesions, such as very small lesions, lesions just under the skin or very close to the chest wall compared with true cut biopsy. In addition, FNAB maintains tactile sensitivity, allows multidirectional passes allowing a broader sampling of the lesion and immediate reporting where necessary. However, FNAB is less reliable at differentiating invasive cancer from DCIS, may be limited in some cases in the assessment of tumor grade and prognostic.[15]

The age of cases with malignant lesions was 50.7 ±12.2 year. It is consistent with that reported in Iraq (49.4 ± 11.66) years [16].

This study showed that sensitivity of FNAB was 87.3%. It is lower than that reported in literature (92.7%) in Meta-analysis study.[17] In the recent years automated core needle biopsy, and various suction assisted devices of increasing core diameter, with mounting numbers of tissue pieces collected from each lesion, have replaced FNAB as the 1st line of diagnosis. The accuracy of FNAB depends on the experience of cytopathologist and the physician performing the procedure. High figures of accuracy reported in the world e.g. sensitivity (92%) [18], (99.4%) [19] and specificity (97%) [18](100%) [19].

The observed figure of sensitivity (87.3%) is within the reported sensitivity range in United Kingdom (84%-93%). The calculation of observed figure was complete one i.e. considering all abnormal results in one category. However, result of FNAB in UK used distinguished classification and results. The finding was outcome of the screening established in 1987 [20]. In Iraq, there are an early detection services rather than screening program[12].

In early years of breast screening program, FNAB was used, then Core biopsy (CB) was introduced and recently, wide bore vacuum biopsy. CB has been improved and considered the standard, completely in UK.[21] Unfortunately in Iraq research still is digging in FNAB. The positive and negative predictive values of FNAB were 100%, and 88.7% respectively. Similar finding were reported in literature [22, 23, 24] .The FNAB is a good test for pre-operative decision, but true

cut always provides a better histological diagnosis and is more accurate and more trusted.

The suspicious diagnosis was found among 17 (13.2%) of the study subjects. This was lower than reported in Pakistan, (20%) [22] and higher than that reported in Nigeria (12.4%).[19] These variation might reflect the difficulties in the developing world, facing diagnosis of malignancy.

FNAB findings influenced by the maneuver (number of times inside the lump). It was practiced as 10 times maneuver to get harvests cells for examination[25, 26].

CONCLUSION

The study confirmed the high figures of accuracy of FNAB.

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