Clinical Breast Examination & Ultrasound Results for Women in Breast Examination Clinic /Al-Yarmouk Teaching Hospital: Comparative Study

Rasha Wasof Omar[1] Jamal M. Alkhudhairi [2]

1. **MBChB, FICMS (FM), Specialist in Family Medicine/ Al-Dora Primary Health Sector/ Al-Karkh Health Directorate/ Ministry of Health – Iraq.**
2. **PhD, MSC, MBChB, Professor / Al-Mustansiriyah University / College of Medicine - Family & Community Medicine Department**

Abstract:

Background: Breast cancer is responsible for third registered Iraqi female cancers. Early detection of breast cancer saves lives and preserves breasts. Screening tools include Clinical Breast Examination, breast self-exam, mammography, ultrasonography, magnetic resonance imaging, & fine needle biopsy. Low survival rates in Iraq, is attributed to lack of early detection programs, coupled with inadequate diagnostic and treatment facilities.

Objectives: To compare Ultrasound (U/S) with clinical breast examination results for breast disease, in order to improve breast examination outcomes by combining Ultrasound with clinical examination.

Patients and Methods: A random sample of 305 women $\geq$ 30 yrs. were included from attendants to breast examination clinic, in a cross-sectional hospital-based study, conducted in Al-Yarmouk teaching hospital – Baghdad from 1st January to 30th July 2015, under ethical approvals. After ensuring privacy, breast cap size was determined, followed by clinical breast examination. Any masses in clinical exam and ultrasound report were plotted on illustrative sketches. SPSS v.20 was used for statistical analysis, in addition to Cohen Kappa test for comparative evaluation of results.

Results: Mean age of attenants was 42±yrs. The most prevalent reason (58.4%) for visiting breast clinic was Mastalgia, and the least (2.6%) was feeling of abnormal axillary lymph nodes. In Breast exam, masses were revealed in 28.5% of sample, 6.2% women had palpable axillary lymph nodes. Ultrasonography showed abnormalities in 46% of women, 61.7% were benign and 20.6% malignant, the rest were dilated lactiferous ducts. Benign axillary lymph nodes were detected by ultrasound in 13.1% of the studied sample, while malignant nodes detected formed 3%. Breast abnormalities detected by clinical breast examination substantially agreed with ultrasound (k= 0.607, p<0.0001). There was no significant difference in breast abnormality's location detected by clinical exam and ultrasound. Finally, breast cup size did not associate significantly with breast mass criteria.

Conclusion: the ability of detecting breast abnormalities would be raised, when integrating clinical breast examination with breast ultrasound.

Key words: Ultrasound breast exam, clinical breast exam, breast examination clinic, breast cup

Introduction:

Breast cancer survival ranges from >80% in North America, to < 40% in low-income regions [1, 2]. Survival variation reflects awareness level differences, availability to early detection and treatment modalities [3]. The mean risk of developing breast cancer increases with age [4].

Breast cancer is responsible for third registered Iraqi female cancers, and quarter female deaths. It is often diagnosed at advanced stages, yielding high mortality incidence ratio [5, 6]. The goal of early detection is to find it before symptoms [7]. Screening tools include Clinical Breast Examination (CBE) performed by a trained health provider [8]. CBE sensitivity ranges 40-70%, and specificity 86-99%. Breast self-exam (BSE) is self-checking breasts for lumps. Alone, it was not found to help reduce breast cancer deaths [9]. Mammogram is an x-ray based procedure for early detection of breast cancer. It can reduce breast cancer deaths among women over age 50 [10]. While it has a relatively high sensitivity (56-95%), the specificity may be inadequate, causing increased use of ultrasonography and biopsies [9]. Ultrasonography is an imaging test that sends high frequency sound waves through breast, and converts them into images [11]. It is 83.3% sensitive, and 65.5% specific [12]. Ultrasonography can be used to differentiate between fluid filled cysts, and solid tumors [11,13]. Thus, it can help in differentiating between benign and malignant tumors, often without the need for a biopsy. It has become a valuable tool in assessing breast masses, being widely available, quick, non-invasive, and less expensive than other imaging modalities [14]. Breast magnetic resonance imaging (MRI) is

more likely to find cancer than mammography, but often misses some cancers that mammography easily detects [15]. Fine Needle Biopsy (FNB) being 87% sensitive, 99.5% specific [14], helps to distinguish inflammatory, reactive, or cystic lesions from neoplasms [16].

Low survival rates in Iraq, is attributed to lack of early detection programs, coupled with inadequate diagnostic and treatment facilities [17] as mammography machines, ultrasounds, well-trained radiologists, and quality control [18].

This research aims to compare Ultrasound (U/S) with clinical breast examination results for breast disease, and to determine the degree of agreement between them in order to improve breast examination outcomes by combining Ultrasound with clinical examination.

Patients & Methods:

This cross sectional hospital based study was conducted in Al-Yarmouk teaching hospital – Baghdad from 1st January to 30th July 2015, under ethical approvals from MOH and Iraqi board.

A random sample of 305 women was included from attendants to breast examination clinic, who have undergone ultrasound breast exam, aged $\geq$ 30 yrs. pregnant women were excluded. During a short interview, ensuring privacy & confidentiality, each woman was given full right to participate or not. The female researcher first determined the cup size (reflecting breast size) by subtracting the measure around the chest just below the breast, from the measure around the fullest part of breast (using a tape measure). Differences in 1, 2, 3, 4 inches gives cup sizes of A, B, C, D respectively [19].

Clinical Breast Examination was then performed. Mean size of breast mass achieved by clinical examination were assessed by the researcher to the nearest 0.5 cm. Breast mass location got from BSE results & U/S reports were plotted on sketches (fig 1).

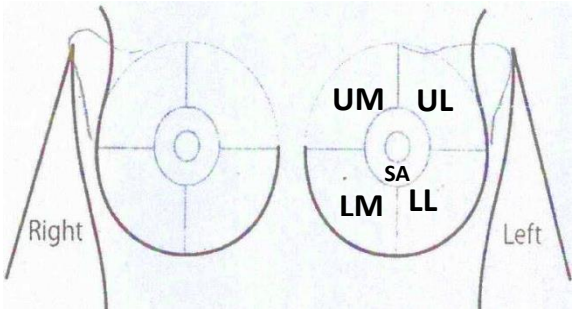

Figure 1: Sketch of Breasts Quarters (upper medial, lower medial, upper lateral, lower lateral quarters, and sub areolar space)

Statistical analyses were done using spss v.20. P-Values of 0. 05 were cut offs for significancy. Cohen Kappa test[20] was used for comparative evaluation of CBE results, with U/S findings in detecting breast abnormalities:

$$k = \frac{Probability\ (observed) - Probability\ (expected)}{[1 - \ Probability\ (expected)]}$$

Results

The current study included 305 women with mean age (42 ±11) years ranging from 39 to 89 years. The most prevalent reason (58.4%) for visiting breast clinic was breast pain (Mastalgia), and the least (2.6%) was feeling of abnormal axillary lymph nodes. Nevertheless, there were other complaints like feeling of breast mass, nipple discharge, and disfigurement (not tabulated).

According to clinical breast examination for 305 participant women: Breast mass was revealed in 87 (28.5%) of them. Small masses were in 68 (78.2%), medium in 17 (19.5%), and large sized in 2 (2.3%) of women. Clinical examination of study group showed 19 (6.2%) of them had palpable axillary lymph nodes (table 1).

Table 1: Comparative findings of Clinical breast examination and sonographic examination, among studied women (N=305):

	Clinical Breast Exam	Ultrasound
Mass Size Range	(5-50) mm	(3-65) mm
Mass size	**N (%)**	**N (%)**
Small (<2 cm)	68 (78.2)	84 (72.4)
Medium (2-5 cm)	17 (19.5)	28 (24.1)
Large (>5 cm)	2 (2.3)	4 (3.4)
Subtotal	**87 (28.5)**	**116 (38.03))**
Mass Criteria		
Benign	-	87 (61.7)
Malignant	-	29 (20.6)
Dilated lactiferous ducts*	-	25 (17.7)
Vascularity		
Avascular	-	110 (78.0)
Vascular	-	31 (22.0)
Subtotal	**87 (28.5)**	**141 (46.2)**
Axillary lymph nodes	19 (6.2)	49 (16.06)
Benign	-	40(13.1)
Malignant	-	9(3.0)
No Detected nodes	286 (93.8)	256 (83.9)
Total	**305 (100)**	**305 (100)**

* Dilated lactiferous ducts are vascular abnormality (not masses).

Ultrasound examination was done by radiologist in the breast clinic for all 305 included women. It showed abnormalities in 141 (46%). The other 164 (54%) were apparently normal on U/S exam.

The ultrasound criteria of breast abnormalities revealed masses with benign changes in 87 (61.7%), and malignant criteria in 29 (20.6%) of cases, while, dilated lactiferous ducts were found in 25 (17.7%) of cases.

Out of the diagnosed 116 breast masses by ultrasound, 84 (72.4%) of the masses were small, 28 (24.1%) were medium, and only 4 (3.4%) of them were of large size. The breast abnormalities shown to be avascular in more than three fourths (78%) of the cases, while it was vascular in 31 (22%) of the cases.

Axillary lymph nodes with benign criteria were detected by ultrasound in 40 (13.1%) out of 305 included women, while it showed a malignant criterion in 9 (3%) of the study participants; on the other hand no abnormalities were shown in the axillary lymph nodes of the rest (table 1).

Breast abnormalities detected by clinical breast examination substantially agreed with that detected by ultrasound ($k= 0.607$, $p<0.0001$). (Table2)

Table 2: CBE and Ultrasound agreement for presence of breast abnormalities:

Clinical Breast Exam	Breast U/S: Abnormality	Breast U/S: No Abnormality	Total
Abnormality	85	2	**87**
No abnormality	56	162	**218**
Total	**141**	**164**	**305**

Cohen's kappa= 0.607, p<0.0001(Substantial significant agreement)

In comparison, between the location of breast abnormalities by clinical and ultrasound, there was no significant differences between them. (Table 3)

Table 3: Comparison between U/S and clinical examination of included women (N=305), regarding the location of breast abnormalities.

Abnormality	**CBE**	**U/S**	
Location	**No. (%)**	**No. (%)**	**χ^2= 2.56**
UM	22 (25.3)	26 (18.4)	**df= 4**
LM	5 (5.7)	7 (5.0)	**p= 0.634**
LL	15 (17.2)	21 (14.9)	
UL	22 (25.3)	39 (27.7)	
SA	23 (26.4)	48 (34.0)	
Total	**87 (100)**	**141 (100)**	

The most frequent breast cup size in the studied sample was B which is the measure of 168 (55%) of them, followed by A size in 81 (27%) then C and D in 50 (16%) and 6 (2%) respectively. Breast cup size did not associate significantly with breast mass criteria. (Tables 4)

Table 4: Relation between breast cup size with breast mass criteria detected by sonography in women from the study sample (N=305).

Cup size	**U/S Mass criteria* No. (%)**			**p-value**
	Benign	Malignant	Total	**0.241**
A (27%)	34 (79.1)	9 (20.9)	43 (100)	
B (55%)	43 (76.8)	13 (23.2)	56 (100)	
C+D (18%)	10 (58.8)	7 (41.2)	17 (100)	
Total	**87 (75)**	**29 (25)**	**116 (100)**	

* Dilated lactiferous ducts weren't included with masses.

Discussion

Early detection of breast cancer saves lives and preserves breasts. Early detection has two components, namely breast awareness and breast screening. In low-income countries the greatest obstacle to mass mammographic screening is equipment cost and running the programs.

When data of the current study was revised, there were 305 women consulting breast clinic, mostly younger than 50 years, reflecting shift of breast problems to younger age. This trend for disease to affect younger generations has been comprehensively illustrated in Iraqi Cancer Registry, and other reports from neighboring countries. [21-23]. This also agrees with other study in Iraq showing incidence of breast cancer affecting younger age women compared to their developed countries counterparts [24].

In Iraq, as a low middle income country, the resources for establishing a fully equipped nationwide early detection system for target population at risk are limited. There is inadequate number of well-trained health providers at primary health care level regarding the importance of clinical breast examination in early detection of breast cancer. Mammography machines, as main screening tools for breast cancer, are available only in major hospitals of each Iraqi province, yet those are mainly used for diagnostic purposes in patients who present with palpable breast lumps. Obviously, due to cost effective measures, lack of resources and economic challenges that Iraq is facing, it is not expected that health authorities could provide mammography devices across every health care center in the country to be used for screening of all Iraqi women.

The leading complaint for breast clinic visiting in the current study was mastalgia which agrees with study conducted in turkey 2010 [25]. Mastalgia being the most frequent reason for presenting to an outpatient clinic in relation to breast may be because it disrupts the quality of life, especially due to the worry of having cancer. On the other hand this disagrees with other studies which showed that leading complain differ; as in a retrospective study of over 300 referrals in Sheffield revealing (66%) of women presented with a lump or mass[26]

This reflects the weak practice of breast self-examination of Iraqi women who come only when mastalgia start, which is in line with an Iraqi study in 2011 showing only 48.3% practiced BSE; the most common reason for not doing so was lack of knowledge of how to perform the technique correctly [27].

Breast physical examination (CBE) of the studied group showed (28.5%) of them had palpable mass. Moderate size breast mass (2-5) cm represented one fifth of them. The range of breast mass size in current study, measured by different methods (clinical, and ultrasound), did not show evident differences, and they were approximately convergent in their mean size. That surely reflect the late presentation of those women, and the weak practice of clinical breast examination at the primary health care level.

BSE is one of the screening tools in our country known to be important for women who do not receive regular mammograms, either because mammography is not recommended (i.e., women aged 40 and younger) or because some women do not receive screening mammography consistent with recommended guidelines. Specifically, CBE presents an opportunity for health care providers to educate women about breast cancer, its symptoms, risk factors, and advances in its early detection, as well as normal breast composition and variability. It also lets clinicians discuss the benefits and limits of breast self-examination (BSE) and demonstrate BSE for women who elect to do it [28].

Breast abnormalities detected by clinical breast examination in the current study substantially agreed (Kappa 60%) with that detected by ultrasound. This agrees with a cross-sectional comparative study [29] involving antenatal clinic attendees at the Federal Teaching Hospital, Nigeria, 2014 which indicates that although more lesions were detected with breast ultrasonography than by CBE, there was no statistically significant difference between them.

There were no significant differences, between the locations of breast abnormalities detected by clinical, and ultrasound, denoting agreement about abnormality site and support the precision of ultrasound to localize the suspicious area.

The most common site for breast abnormalities which was detected by the clinical, ultrasound, was sub areolar area followed by upper lateral quadrant. This disagrees with the fact which revealed the upper lateral quadrant is the most common site of origin of breast cancer, followed by the central area [30].

We can increase the chance of early detection of breast abnormalities by performing clinical breast examination alongside with ultrasound method, thus by combination of both, extra cases can be referred to be evaluated by the other imaging tests.

Our study results showed that ultrasound adds more to the CBE. It detected wider range masses; discovered more frequent masses in all sizes. U/S also distinguished mass criteria of malignancy, and revealed mass vascularity. In addition, more axillary nodes were found by U/S, and their malignant criteria were specified.

It can be concluded that ability of detecting breast abnormalities would be raised, when integrating clinical breast examination with breast ultrasound, as the latter is handy user friendly, not invasive, can be portable device. U/S might be a useful alternative to mammogram in conjugate with CBE in young premenopausal women who are not candidate for the screening programs, and in those who refuse mammography. At the Primary Health Care level, addition of breast ultrasound as an adjuvant tool to clinical breast examination, and public health awareness campaigns led by family doctors, should be endorsed by policy makers to encourage every Iraqi woman for BSE and to seek medical advice promptly.

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