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Research Article

COMBINED ROLE OF MAMMOGRAPHY AND ULTRASONOGRAPHY IN THE DETECTION OF BREAST LUMP

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Abstract:

Purpose: Purpose of this study is to find out the combined role of mammography and ultrasonography in the detection of breast lumps.

Study Design: Cross-sectional Study Design.

Material and Method: It was a time-based study of three months. Total 127 symptomatic patients with age range 25yrs to 80yrs were referred for mammography and ultrasonography as well. Imaging was performed at GE medical System mammography machine and Nemio, 20 Toshiba ultrasound machine. Data was analyzed using SPSS Version 20.0.

Results: Out of 127 patients 78% presented with pain, 63% with palpable mass, 47% with tenderness and 30% were with positive family history. On mammogram 78.7% were having normal density whereas increased density was noted in 21.3% cases. Individual %age mass detected on USG and mammography were 55.1% & 8.7% respectively, on combining 7.1% were further detected. On the basis of BI-RADS Classification 16% to 14% patients were categorized as CAT 4 & 5. Sensitivity and specificity of USG for mass detection, calcification and Lymphadenopathy was 0.81, 0.5, 0.71, 0.47, 0.84, and 0.80 respectively.

Conclusion: Undiagnosed Breast mass/lump may lead to Breast cancer and it is the most common cause of death from malignancies that affect the female gender. Combining of ultrasonography with mammography can reduce the %age of undiagnosed cases.

Key words: Breast Mass, Ultrasonography, Mammography, Sensitivity, Specificity. BI-RADS.

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INTRODUCTION:

Breast cancer is by far the most common cancer in women. In 2011 there were 50,285 new cases in the UK and, of those, 349 cases were in men. This gives a male: female ratio of 1:144. Within the UK, rates are approximately similar for all countries. Scotland has a slightly higher incidence rate in women and Northern Ireland has a slightly lower rate. The lifetime risk of (females) developing breast cancer in the UK is 1 in 8. The European age-standardized incidence rate across the UK in 2011 was 118.4-130.2 per 100,000 women. (Nice, 2013) . Breast is a secondary sexual characteristic in females. A source of nutrition for the neonate. It is also present in a rudimentary form in males. Any aberration leads to the susceptibility to a spectrum of pathologies like, various benign breast lesions including fibroadenoma, simple cyst, breast abscess, galactocele, ductal ectasia, enlarged lymph nodes and different malignancies are common. Breast cancer is most common cause of cancer death in women and overall fifth common cause of cancer deaths in the world. Delay in the detection causes, malignancy to progress in advanced stage. (Houserková, 2007).

In developing countries like Pakistan and India females are unaware of breast pathologies and are hesitant to reveal. Hence they are detected usually in advanced stages. It can be controlled if detection and diagnosis are made in the earliest stages i.e., in the pre-invasive and clinically nonpalpable stage. The ideal protocol for imaging the breast in a young woman is controversial. Mammography, Ultrasound, MRI, Ductography, Scintimammography and FNAC are modalities used for diagnosis. Mammography is used as a screening method for early detection of breast cancer in women after 40, in some countries after 50 years of life, while breast ultrasound is the imaging of choice in women under 40 years. With an appropriate combination of ultrasound and mammography, the number of undetected breast cancers can be reduced to a minimum. (Mujagić, 2011)

The incidence of breast lesions especially the benign lesions begins to rise during the second decade of life and peak fourth and fifth decades. All women irrespective of their ethnic origin or heritage are at risk of developing breast cancer. Leading factors among those that affect breast carcinoma development, are the roles of genetics and environment, the reproductive

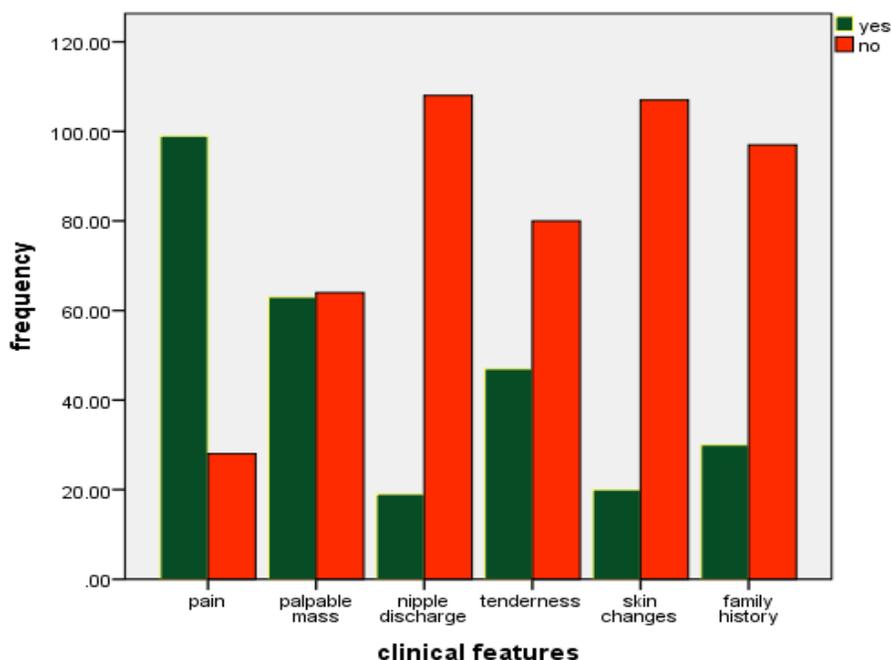
experience, the effect of endogenous and exogenous hormones in females, the change in immune status and the biologic determinants of breast carcinoma.

Incidence rates vary greatly worldwide from 19.3 per 100,000 women in Eastern Africa to 89.7 per 100,000 women in Western Europe. In most of the developing regions the incidence rates are below 40 per 100,000. The lowest incidence rates are found in most African countries but here breast cancer incidence rates are also increasing (Globocan, 2008). According to a study carried out at Gujranwala Institute of Nuclear Medicine and Radiotherapy, Gujranwala (GINUM). Approximately one in every nine Pakistani women is likely to suffer from breast cancer. This is one of the highest incidence rates in Asia. Pakistani women show an incidence rate of 50/100,000 and in the neighboring country India, with similar socio-cultural background the incidence rate is 19/100,000. The pattern of rapid premenopausal increases in breast cancer is also seen in Pakistan, but breast cancer risk is higher after the age of 45 years. The South Karachi Cancer Registry suggests that the age-standardized annual rate of breast cancer in Pakistan is 69.1 per 100,000, a figure equivalent to European and North American rates. In fact, Pakistan's population boasts the highest rate of breast cancer amongst all Asian countries (excluding Jews in Israel) as, and over 90,000 women suffer from breast cancer annually (Rasheed, 2013).

MATERIAL AND METHOD:

A Cross-sectional study was conducted in the Department of Radiology INMOL Hospital, Lahore. The duration of this study was 3 months (October 2020 - December 2020). A total of 127 patients were studied who came for mammography as well as ultrasonography during three months. The data is collected through Performa By using consecutive sampling technique. Symptomatic females undergoing for both mammography and ultrasonography with an age limit from 25yrs to 80yr were selected. The required data was collected after completion of both scan. Appropriate statistical data analysis technique by using SPSS version 20.0 (Statistical Package for Social Sciences) was applied. Quantitative results were expressed as descriptive statistics and qualitative were in frequency and its percentage.

RESULTS:



Graphical representation of clinical features of breast lumps

Table 1 showing lumps detected on mammography and ultrasonography

Shape Of Mass	Mammography (Alone)	Ultrasound (Alone)	Combined
Not Detected	116 (91.3%)	57 (44.9%)	55(43.3%)
Round	4(3.1%)	19(15.0%)	3(2.4%)
Irregular	7(5.5%)	42(33.1%)	4(3.1%)
Ovule	0	9(7.1%)	0

Table 2 showing Mass, lymphadenopathy & calcification noted on ultrasonography and Mammography

Features	Mammography		Ultrasound(usg)		Usg +ve Mamo-ve	Usg-ve Mamo+ve	Both +ve	Both-ve
	+ve	-ve	+ve	-ve				
Mass Detected	11 (8.7%)	116 (91.3%)	70 (55.1%)	57 (44.9%)	61 (48.0%)	2 (1.6%)	9 (7.1%)	55 (43.3%)
Lymphadenopathy detected	28 (22.0%)	99 (78.0%)	39 (30.7%)	88 (69.3%)	19 (15.0%)	8 (6.3%)	20 (15.7%)	80 (63.0%)
Calcification noted	16 (12.6%)	111 (87.4%)	16 (12.6%)	111 (87.4%)	8 (6.3%)	8 (6.3%)	8 (6.3%)	103 (81.1%)

DISCUSSION:

127 female patients with the suspension of breast lump were enrolled for the study because they underwent for both mammography as well as ultrasonography. While taking the history from the patient the sign and symptoms revealed that maximum patients with the suspension of breast lump were presenting with pain and a palpable mass in the breast and few of among them were with the history of tenderness and positive family history too. Positive family history is an important risk factor regarding breast cancer in early age. Mammography of symptomatic patients showed normal breast density of 100 patients whereas 27 were with altered breast density with respect to their age which may lead towards false negative results here ultrasonography played an important role by detecting pathologies in Mammographically dense breast. (Mujagić *et al*, 2011) showed the higher accuracy of ultrasound than mammography in symptomatic women with highly dense breast and below 45 years as well. Chairat *et al*, (2013) studied the diagnostic value of ultrasonography and mammography in the detection of breast cancer in areas where health resources were limited. Comparing between the two imaging modalities, ultrasonography had higher cancer prediction and utility than mammography. Mammography may have some limitations in diagnosing dense breast while ultrasonography may have more advantages in diagnosing specially in the differentiation of breast cyst. The study indicates that breast imaging was valuable in diagnosing cancer in patients presenting with breast lump. In health restricted areas, performing both imaging modalities may be unnecessary. However, a better prediction may be gained by a combination of different modalities ultrasonography followed by mammography vice versa.

CONCLUSION:

It is concluded that ultrasound plays an essential role in the evaluation of the breast. It has progressed from its former limited role of determining whether a mass is cystic or solid into a method to assist in the differentiation of a benign from a malignant lesion. It is particularly useful in dense breast tissue. The ability to correlate a benign ultrasound mass with a mammographic mass eliminates the need for further intervention.

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