PATTERN OF MAMMOGRAPHY AND SONOGRAPHY FINDINGS AMONG FEMALES REFERRED FOR SCREENING BREAST IMAGING AT TERTIARY CENTRE IN GUJARAT

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ABSTRACT

BACKGROUND

Screening is essential for accurate diagnosis of breast disease and early detection of breast cancer. Mammography and ultrasound are the first line of investigations for imaging the breast. The aim of the study is to evaluate pattern of breast lesions using mammography and ultrasonography among patients referred to radiology department for screening.

MATERIALS AND METHODS

Our study group consisted of 114 female patients with breast symptoms such as palpable lumps, pain in the breast and nipple discharge who were examined prospectively. All 114 patients were examined by both mammography and sonography independently. Fine needle aspiration cytology (FNAC) or core-cut biopsy was done according to the findings of mammography and sonography with the help of BIRADS grading.

RESULTS

In this study among the 114 patients 44% of the patients had a benign aetiology, 20% had a malignant aetiology and 34% were normal, 8% had benign lymphadenopathy and another 8% had malignant lymphadenopathy. The most common quadrant involved was right upper quadrant. In right breast, 47% patients were BIRADSI and 1.8% were BIRADSV. In left breast, 61% patients were BIRADSI and 0.9% were BIRADSV; 25% patients had calcification, while 75% did not have it; 6% patients had positive family history, while another 6% had skin changes. Nipple discharge was present in 13% patients. Pain was present in 42% patients. Lump was present in 41% patients.

CONCLUSION

The combination of mammography and sonographic screening of woman for breast lesions have significant effect on outcome, since earlier detection of breast carcinoma with no distal spread will be treated surgically with more cure rate. In our tertiary centre patients usually presented in late stage with distal spread, which were treated by surgery followed by chemoradiation and palliation with significant effect on lifestyle of the patient and socio-economic status of the family and on the community. Annual screening program and creating awareness in the community about the breast cancer will help early identification and cost-effective treatment.

KEYWORDS

Breast Masses, FNAC, Breast Cancer, Breast Imaging.

HOW TO CITE THIS ARTICLE: Suthar B, Mehta C, Abhishek S, et al. Pattern of mammography and sonography findings among females referred for screening breast imaging at tertiary centre in Gujarat. J. Evolution Med. Dent. Sci. 2017;6(88):6118-6122, DOI: 10.14260/jemds/2017/1329

BACKGROUND

Screening is essential for accurate diagnosis of breast disease and early detection of breast cancer. Mammography and ultrasound are the first line of investigations for imaging the breast. Mammography is the only screening modality, which has been proven to reduce mortality from breast cancer through early detection.¹

Mammography features of breast opacity (Fig. 1a, b), architectural distortion, suspicious calcification, skin thickening and nipple discharge may all be suggestive of breast disease. Cluster of microcalcification (Fig. 2a, b) may

be an early sign of breast cancer. This can also facilitate the discovery of an occult lesion on opposite breast. Asymmetric soft tissue density, calcification and well-circumscribed breast opacity (Fig. 3) are commonest mammography findings among symptomatic women.²

Sensitivity of mammography in detection of breast cancer in the screening setup ranges from 83% to 95%.³ However, it decreases to as low as 30% - 48% in patients with radiologically dense and glandular breast.⁴ Breast density is influenced by stage of menstrual cycle, parity, obesity, age and ethnicity. So young women tending to have dense breast and usually having mammograms that are difficult to interpret.⁵ There is an inverse relationship between patient's age and mammographic breast density. The breast density should be considered when evaluating the potential benefit of extended imaging breast cancer screening, especially in high-risk women.⁵

Adding a single screening ultrasound to mammography will yield an additional 1.1 to 7.2 cancers per 1000 high-risk women. So supplementary ultrasound screening is useful in

'Financial or Other Competing Interest': None.

Submission 05-09-2017, Peer Review 25-10-2017,

Acceptance 31-10-2017, Published 06-11-2017.

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DOI: 10.14260/jemds/2017/1329

detecting early stage mammographically detected and clinically occult breast cancers in Asian women with dense breasts.⁶

So documentation of mammography and ultrasound findings in symptomatic females will help in demonstrating relevance of these imaging in assessment of breast disease with view to create great awareness about breast imaging in clinician and patients.^{5,6}

MATERIALS AND METHODS

It is a cross-sectional study of 114 women who were having all or either of above common breast symptoms. This study was done in Radiology Department, SSG Hospital. All symptomatic women underwent bilateral breast sonography and mammography.

The exclusion criteria were incomplete diagnostic reports, impossibility of pathology evaluation of the specimen and lack of followup. Questionnaires were filled by details such as age, family history, past history and breast symptoms. Mammography was performed in two mediolateral and craniocaudal views of each breast for these cases. Ultrasonography also was performed by a radiologist in supine position. His or her reports also were divided into normal, benign, suspected and malignant. Radiological findings were classified according to BIRADS grading.⁷

Statistics

Sonomammography screening study of 114 patients were screened with age distribution and maximum number of patients were between the age group of 41 - 50 years.

Age Range	Number	Percentage
<30	02	01.78%
31-40	44	39.28%
41-50	45	40.17%
51-60	12	10.71%
61-70	09	08.03%
Total	112	100%

Table 1. Age Group Distribution

In symptomatology distribution, major complaint was breast pain followed by breast lump and other complaints are tabulated in table below.

Complaints	Numbers	Percentage
Breast lump	46	41.1%
Breast pain	47	42.0%
Nipple discharge	15	13.4%
Skin changes	07	6.30%
Family history	07	6.30%
Total	112	100%

Table 2. Patient's Symptomatology

In the mammography study large number of patients had normal glandular appearance, other abnormal findings were noted in 43 patients with their frequency of abnormality are tabulated below as follows.

MAMO-RT	Frequency	Percent	Cum Percent
Isodense lesions	7	6.3%	6.3%
High density well-defined lesions	12	10.7%	17.0%
High density	8	7.1%	24.1%

speculated margins			
Low density lesions	1	0.9%	25.0%
Asymmetric density lesions	11	9.8%	34.8%
Dense glandular	4	3.6%	38.4%
Normal	69	61.6%	100.0%
Total	112	100.0%	100.0%

Table 3. Mammographic Findings

MAMO-LT1	Frequency	Percent	Cum Percent
Isodense lesions	8	7.1%	7.1%
High density well-defined lesions	9	8.0%	15.2%
High density speculated margins	10	8.9%	24.1%
Low density lesions	10	8.9%	33.0%
Asymmetric density lesions	5	4.5%	37.5%

Table 4

Dense glandular	5	4.5%	37.5%
Normal	70	62.5%	100.0%
Calcification	25	17.3-34.1	

Table 5. Pattern of Fibroglandular Breast Tissue

The most prevalent sonographic breast pattern was the normal fibroglandular. Sonographic findings include iso or hypoechoic lesion with ill-defined border and internal vascularity representing malignant lesions (Fig. 7a to d) or well-defined border without showing vascularity within representing benign lesions (Fig. 6a) and some were having anechoic cystic lesions representing cysts or dilated ducts (Fig. 5a, 5b) and (8a, 8b) and some of the patients had axillary lymphadenopathy.

USG RT	Anechoic	7.1	3.1 - 13.6
	Hypoechoic	17.9	11.3 - 26.2
	Isoechoic	3.6	1.0 - 8.9
	Mixed echogenicity	5.4	2.0 - 11.3
	Other	8.0	3.7 - 14.7
	Normal	58.0	48.3 - 67.3
USG LT	Anechoic	10.7	5.7 - 18.0
	Hypoechoic	15.2	9.1 - 23.2
	Isoechoic	3.6	1.0 - 8.9
	Mixed echogenicity	8.9	4.4 - 15.8
	Other	61.6	51.9 - 70.6
	Normal		

Table 6. Sonographic Findings

LNE	Benign	8.0	3.7 - 14.7
	Malignant	8.0	3.7 - 14.7
	No Lymphadenopathy	83.9	75.8 - 90.2

Table 7. Lymph Node Findings

DUCTAL ECTASIA	Right	4.5	1.5 - 10.1
	Left	3.6	1.0 - 8.9
	Bilateral	7.1	3.1 - 13.6
	Normal	84.8	76 - 90

Table 8. Mammary Duct Findings

BIRADS RT	1	47.3	37.8 - 57.0
	2	32.1	23.6 - 41.6
	3	11.6	6.3 - 19.0
	4	7.1	3.1 - 13.6
	5	1.8	0.2 - 6.3
BIRADS LT	1	61.6	51.9 - 70.6
	2	28.6	20.4 - 37.9
	3	5.4	2.0 - 11.3
	4	3.6	1.0 - 8.9
	5	0.9	0.0 - 4.9
Table 9. BIRADS Grading of both Breast Lesions			

PROV DIAGNOSIS	Benign	44.6	35.2 - 54.3
	Malignant	20.5	13.5 - 29.2
	Normal	34.8	26.1 - 44.4
Table 10. Provisional Diagnosis			

RESULTS

In this study among 114 patients 44% of the patients had a benign aetiology, 20% had a malignant aetiology and 34% were normal, 8% had benign lymphadenopathy and another 8% had malignant lymphadenopathy. The most common quadrant involved was right upper quadrant.

In right breast, 47% patients were BIRADSI and 1.8% were BIRADSV. In left breast, 61% patients were BIRADSI and 0.9% were BIRADSV. 25% patients had calcification, while 75% did not have it. 6% patients had positive family history, while another 6% had skin changes. Nipple discharge was present in 13% patients. Pain was present in 42% patients. Lump was present in 41% patients.

Figure 1a, 1b. Mammography Image showing Abnormal Ill-Defined Breast Opacity suggesting Carcinoma

Figure 2. Mammography Image showing Abnormal Microcalcifications

Figure 3. Abnormal Large Radio-opacity of Breast in a Patient with Hard Lump of Right Breast Turned out to be Mammary Cell Carcinoma on Excisional Biopsy

Figure 4a, 4b. Abnormal Ill-Defined Radio-opacity with Speculated Margins and Adjacent Similar Lesion with Microcalcifications seen in Upper Outer Quadrant of Right Breast. Excisional Biopsy of Lesion showed Infiltrating Lobular Carcinoma

Figure 5a. Sonography Images of Anechoic Simple Cyst. 5b. Few Cystic Lesions with Echogenic Stroma in a Patient with Fibrocystic Disease

Figure 6a. Well-Defined Oval-Shaped Hypoechoic Fibroadenoma of Breast

Figure (7a-d). Ultrasonography Images of Malignant Breast Lesion

Figure 8a, 8b. Shows Hypoechoic Lesion in the Dilated Duct in a Patient with History of Bleeding per Nipple turned out to be Ductal Papilloma

DISCUSSION

This is an evidence-based study that evaluates the current status of imaging reports for detecting breast cancer. These indices varied in different studies (Malur et al, 2000; Akbari et al, 2010).⁸ Different factors affect the mammography reports as follows⁴- 1. Evaluation of dense breasts is difficult and often inadequate; 2. Mastitis in tuberculosis and abscess can mimic the cancer; 3. Overlap structures can limit visibility of the masses; 4. Fibrocystic mastitis can disappear the border of a mass, so it may look as a cancer; 5. Breast in young patients contains fibroglandular parenchyma; 6. The number of gravidity and duration of breast feeding; 7. Out of date or uncalibrated mammography setting; 8. Technical difficulties and man power incompetence. Using standard reporting system in mammography BIRADS (Breast Imaging Reporting and Data System) presented by ACR (American College of Radiology) can help the clinicians to understand unique concept from the different radiologist's mammographic reports.⁷ Factors that affect the ultrasonography reports are: 1. Expertise of man power (human power dependent); 2. Small and isoechoic masses are usually undetectable; 3. Microcalcification may not reveal; 4. It is difficult to distinguish masses in fatty breasts; 5. Multicentric cancer may not be detected.

These factors can be classified into three groups: 1. Manpower; 2. Patients; 3. Setting of instruments. Detection of breast cancer in the early stages is the main aim of breast imaging and man power has important role in this detection. Parity and breastfeeding may lead to differentiation of the mammary cells and contribute to stratification of breast tissue, particularly during the first full-term pregnancy.⁸ Moreover, parity and breast feeding possibly reduce ovulatory cycle with oestrogen secretion and increased prolactin production which might decrease women's cumulative exposure to oestrogen as a proliferative hormone in breast tissue (Akbari et al, 2010).⁸ Dense breasts also are another

important factor that decrease the sensitivity of mammography. It causes almost 4% - 12% of false negative in mammography reports in the International studies⁴ (Malur et al, 2001). Health managers in developing countries such as India must pay attention to quality of setting and man power more than current status. Government must standardise the quality of machines (setting) and human power to improve screening and detection of the breast cancer. Also, the medical staff should pay more attention for selecting the cases based on the age, gravidity, breast feeding and soon.

CONCLUSION

The combination of mammography and sonographic screening of woman for breast lesions have significant effect on outcome, since earlier detection of breast carcinoma with no distal spread will be treated surgically with more cure rate. In our tertiary centre patients usually presented in late stage with distal spread, which were treated by surgery followed by chemoradiation and palliation with significant effect on lifestyle of the patient and socio-economic status of the family and on the community.

Annual screening programme and creating awareness in the community about the breast cancer will help early identification and cost-effective treatment.

Limitations

Patients presenting to tertiary centres will present in terminal stage or with widespread disease, as the primary health centres are not provided with the required infrastructure. Also in tertiary centres, they lack good ultrasound and mammographic units with erroneous false-negative interpretations have occurred. These lead to failure of early detection and patients had presented in late stage.

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