

Role of mammography and ultrasonography in the evaluation of suspected breast lesions in Rohilkhand Medical College and Hospital, Bareilly, Uttar Pradesh, India

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Introduction: Breast lesions are common presenting complaints in females in the surgical outpatient department. Breast lesions are broadly classified as benign or malignant. It generally affects the females of reproductive age group. Mammography is used as screening modality as well as an efficient technique in evaluation of clinically suspected breast lesions. **Aim:** The aim of the study was to assess the role of mammography and sonomammography followed by histopathological/cytological evaluation of the lesions in the assessment of breast lesions and to assign the Breast Imaging Reporting and Data System (BIRADS) category. The aim of our study was to determine the efficacy of mammography and sonomammography in the evaluation of women presenting with breast lesions. **Materials and Methods:** We conducted a prospective study on 72 females from January 2018 to May 2018 in the Department of Radiodiagnosis in Rohilkhand Medical College. Mammography and sonomammography characteristics of breast lesions which help to differentiate benign from malignant lesions were assessed. Fine-needle aspiration cytology (FNAC)/biopsy was carried out. **Results:** Mammographic and sonomammographic evaluation of 72 females was done. The lesions were classified according to BIRADS categories based on their mammographic and ultrasonographic (USG) findings. Patients were aged from 8 to 60 years with a mean age of 32 years. It was found that most benign lesions were seen in younger age group while malignant lesions were seen in older age group. The mean age of occurrence of breast lesions was about 20–40 years. The lesions were classified according to BIRADS. The FNAC showed the highest incidence of fibroadenoma (44%) followed by benign cysts (31%). **Conclusion:** Classification of lesions and assigning categories in accordance with BIRADS help to improve the management. Mammography is better in detection of microcalcifications and early occult malignancies. Sonomammography is better in detecting cystic lesions and has an added advantage in guiding FNAC and biopsies. Combination of mammographic and USG evaluation of breast masses was found to be more accurate than either method alone.

KEY WORDS: American College of Radiology, Breast Imaging Reporting and Data System, Breast masses, fine-needle aspiration cytology, malignant breast lesions, mammography, sonomammography

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INTRODUCTION

Breast density is influenced by stage of menstrual cycle, parity, obesity, age, and ethnicity. Breast cancer is one of the most common causes of cancer deaths today, coming fifth after lung, stomach, liver, and colon cancers.^[1] It is the most common cause of death in women.^[2]

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Harmonic imaging and real-time compounding have shown to improve image resolution and lesion characterization.^[3,4]

Young women tend to have dense breasts and their mammograms are there is difficulty interpretation. There is an inverse relationship between mammographic breast density and patient's age.^[5] The sensitivity of mammography in detection of breast cancer in the screening ranges from ~83 to 95%.^[6]

High-resolution sonography is a useful modality that helps to evaluate breast lesions additionally and also helps to characterize a mammographically non-detectable palpable abnormality in dense breast.^[7]

However, it is as low as 30–48% in patients with radiologically dense and glandular breast.^[8]

In our study, an attempt is made to evaluate breast masses using mammography and ultrasonomammography with histopathological/cytological correlation to describe various lesions and differentiate benign from malignant ones.

Indications for breast ultrasound are as follows:

- Differentiation of mammographic lesions Breast Imaging Reporting and Data System (BIRADS) 0–5;
- Palpable lesions: Differentiate between cystic/solid and benign/malignant;
- Pre-operative planning for breast conservation surgery or mastectomy: Tumor size, localization, multicentricity, and multifocality;
- Follow-up measurements of the lesion in patients under neoadjuvant chemotherapy;
- Guidance for interventions;
- Additional breast scanning in mammographically dense breasts (American College of Radiology category 3–4);
- Young women <40 years, in pregnant females, and lactating females;
- Screening in high-risk patients.^[9]

MATERIALS AND METHODS

We conducted a prospective study on 72 females from January 2018 to May 2018 in the Department of Radiodiagnosis in Rohilkhand Medical College. Characteristics of mammography and sonomammography of breast lesions which help to differentiate benign from malignant lesions were assessed.

The exclusion criteria were incomplete diagnostic assessment, the lesions in which pathology evaluation was not performed, and lack of follow-up.^[5]

- BIRADS 0: Further imaging is required. Special mammographic views (compression and magnification), ultrasound
- BIRADS I: Negative
- BIRADS II: Benign findings (cyst, fibroadenoma, lipoma, and secretory calcifications)

- BIRADS III: Probably benign, short-interval follow-up suggested (6 months)
- BIRADS IV: Suspicious abnormality
- BIRADS IVa: Low level of suspicion for malignancy
- BIRADS IVb: Intermediate suspicion for malignancy
- BIRADS IVc: Moderate suspicion for malignancy
- BIRADS V: Mammographic appearance highly suggestive of malignancy (spiculated margins, pleomorphic calcification, etc.)
- BIRADS VI: Known biopsy-proven malignancy.

RESULTS

Mammographic and sonomammographic evaluation of 72 females was done. The lesions were classified according to BIRADS categories [Table 1]. Patients were aged from 8 to 60 years with a mean age of 32 years. It was found that most benign lesions were seen in younger age group, while malignant lesions were seen in older age group.^[10] The mean age of occurrence of breast lesions was about 20–40 years [Figure 1]. The lesions were classified according to BIRADS. The FNAC of the lesions was done and it was found that the incidence of fibroadenoma was highest (44%) among all the breast lesions followed by benign cysts (31%) [Graph 1].

DISCUSSION

In the present study, the youngest patient with malignancy was 30 years of age, whereas the oldest patient with benign lesion was of 53 years. The sensitivity of mammography is low in case of benign lesion, especially in dense breasts and for very small lesions. Sensitivity and specificity of mammography for malignant lesions were found to be high because microcalcifications were better detected.^[11] Sonography was found to be more helpful for characterization and differentiation of cystic from solid lesions. The specificity of USG in detecting malignant lesions was less because microcalcifications were not well seen on USG. These observations are similar to those of Prasad and Houserkova^[12] and Texidor and Kazam.^[13]

Irregular shape, high density, spiculated/indistinct margins, and microcalcifications were features of malignancy on mammography; heterogeneously hypoechoic echotexture, microlobulations, taller than wider lesions, internal vascularity,

Table 1: BIRADS categories

BIRADS	Number of lesions
0	2
I	2
II	42
III	12
IV	10
V	2
VI	2

BIRADS: Breast imaging reporting and data system

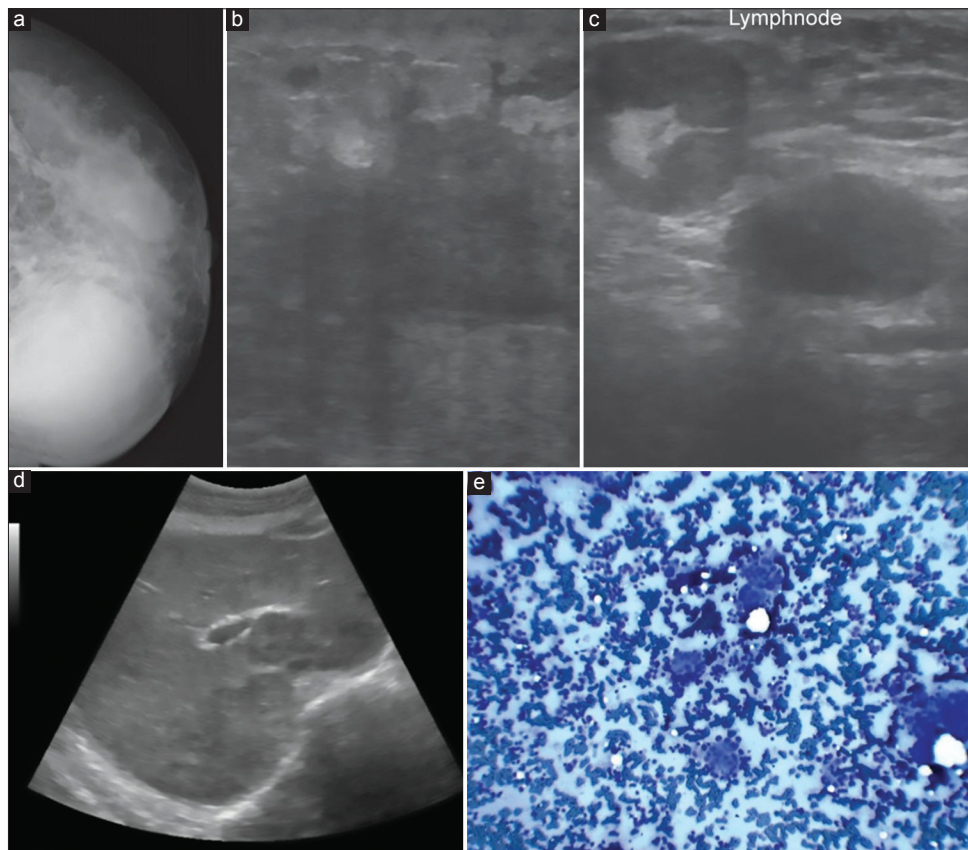
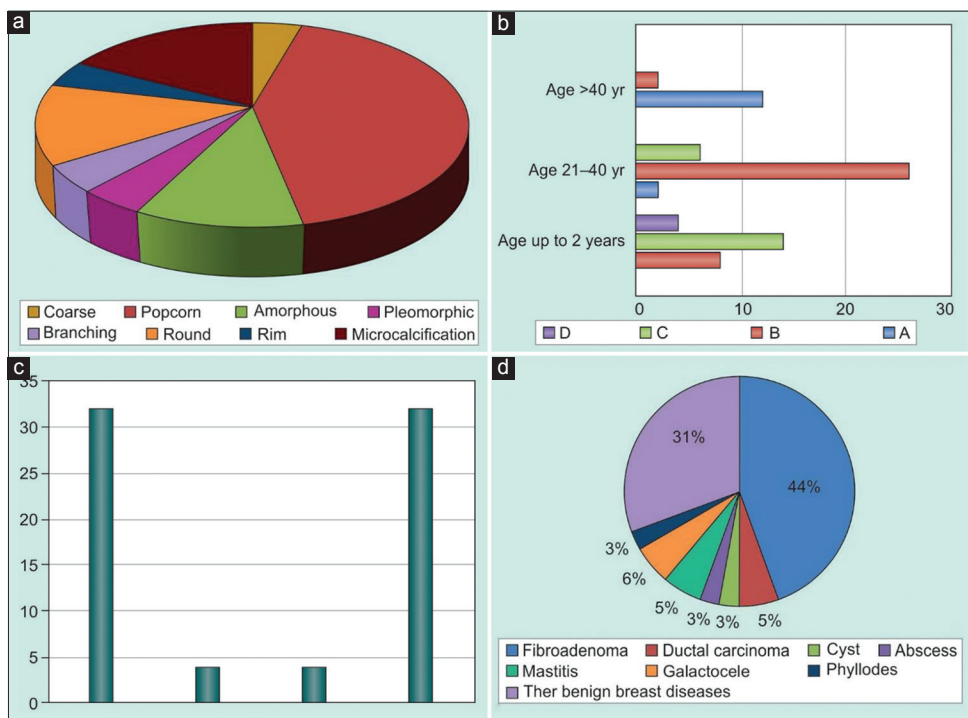


Figure 1: (a-e) Middle-aged female presented with lump in the left breast. The above images depict malignant lesions (from left to right). (a) Mammogram right breast mediolateral oblique view showing two high-density mass-like lesions, one of them is large round to oval lobulated, well-defined margins and another one shows ill-defined lesion with obscured margins associated with nipple retraction and skin thickening. (b) USG high-frequency image showing irregular-shaped hypoechoic lesion with indistinct margins with posterior shadowing. Focal calcification is seen separately. (c) Enlarged lymph nodes with fatty hila. (d) Few hypoechoic lesions in the right lobe of liver suggestive of metastasis. (e) Histopathology report—intraductal carcinoma



Graph 1: (a) Pie chart depicting the morphology of calcification. (b) Bar graph showing the pattern of fibroglandular breast tissue according to age groups. (c) Bar graph illustrating margin of lesions. (d) Pie chart depicting histopathological diagnosis

and features such as skin retraction and nipple thickening were seen in malignant lesions on sonography. Oval shape, wider than tall lesion, and anechoic or homogeneously hypoechoic lesion favor benign nature on sonography. Characteristic shapes of benign and malignant lesions were similar to the description by Sickles.^[14] The calcification features are similar to many of the similar studies.^[12,14]

CONCLUSION

Combination of mammography and USG in the evaluation of breast masses was more accurate than either modality alone. Sonomammography is better in detecting purely cystic lesions. The added advantages of USG include wide availability, lack of ionizing radiation, and assessment of vascularity in the lesion. Mammography is better in detecting microcalcifications and detecting early occult malignancies.^[11] The sensitivity of mammography is less in case of denser breasts. The disadvantages of ultrasound include operator dependence. Self-breast examination and breast screening must be advised for the early detection of breast lesions and for further management.^[15]

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