Original Article

Prevalence of breast imaging reporting and data system (BIRADS) categories and breast consistencies in Central India –A cross-sectional survey

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Abstract

Background: For recognizing the initial stages of breast cancer, mammography is regarded as one of the best modalities and plays a crucial part to lessen morbidity and mortality. For collaborative studies and planning of preventive strategies, it is significant to have baseline data. Thus, in this survey, the frequency distribution of breast imaging reporting and data system (BIRADS) classification and breast consistencies was investigated during the mammographic screening program in the Gwalior region, India. **Material and Methods:** A descriptive, cross-sectional survey was conducted in the Gwalior region, India, in which 1,838 patients were screened with the aid of mammography. The mammography films were evaluated by a single radiologist who determined the BIRADS score, breast composition, and any other abnormal findings. After tabulating the data into MS Excel (MS Office version 2007 developed by Microsoft, Redmond, WA), descriptive analysis and Chi-square test were performed to determine the association between the BIRADS score and breast consistency and setting significance level at (below) 0.05. **Results:** The most commonly found BIRADS score was score 1 (53.4%), followed by score 2 (20.4%), and score 5 was of the least frequency (1.3%). Similarly, the most common consistency found was fatty (48.2%) and the least common was heterogeneously dense (3.97%). The most BIRADS category of 0 was seen in heterogeneously dense (n = 22; 26%) followed by dense breast compositions (n = 18; 25%). The most common consistency found with known breast malignancy (BIRADS 6) patients was the extremely dense breast (n = 11; 40.7%). **Conclusion:** In this study, it was observed that about 57.3% of all the cases were categorized as BIRADS 1 and 20.8% as BIRADS 2.

Keywords: Breast imaging, breast consistency, mammograph

Introduction

In females, breast cancer persists to be one of the foremost public health crises encompassing 22.9% of all the cancers in them in developing as well as developed nations.[1-3] Progressively growing occurrence of this condition is reported in India also. Recently in the country, in many regions, breast cancer occurrence has surpassed that of cervical cancer.[4] The age-standardized incidence rate for this disease in the country is one-third compared to that of the western countries whereas the rates of mortality are excessively more.[5,6] Within the country, the incidence is thrice in the urban areas to that of the rural localities.[7]

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Primary prevention of the disease is extremely difficult as the precise causes of most breast cancers are not identified, and therefore, to attain early detection along with timely and effective treatment, considerable efforts are taken.[8] Previous studies in the western countries have explored the epidemiologic factors and stated multiple major risk factors like family history, aging, lower parity, early menarche, late menopause, and consumption of alcohol.[9,10] The frequency of breast carcinomas and their associated risk factors vary across nations and ethnicities.[11] Earlier researches have revealed the age of onset in Asian females is less in contrast to the western population.[12,13]

A patient diagnosed with breast cancer faces a series of physical and psychological (such as elevated anxiety and depressed mood) challenges forced by major stressors and the burden of surgery, radiation, chemotherapy, and hormonal treatments.[8,14] Therefore, early-stage diagnosis and screening techniques of breast cancer have a crucial part to lessen morbidity and mortality. For the early recognition of breast cancer, mammography is regarded as one of the best modalities, since it can demonstrate breast changes up to 2 years ahead of a physician or patient can detect. Literature shows that yearly mammograms have resulted in early identification of breast cancers while they are generally curable with the possible breast-conservation therapies.[8]

Mammography is recommended every 1–2 years by the World Health Organization (WHO) for women belonging to age 50–69 years.[15] The occurrence of breast carcinoma peaks prior to 50 years of age in India, and that is why it can be believed that in this younger age group mammographic screening is advantageous as well.[6]

The American College of Radiologists (ACR)–BIRADS is a qualitative tool to standardize reporting of radiologic findings by allotting numerical scores (0–6) employed with mammography. This system permits for comprehending of patient records among various doctors and health facilities,[16] and thus, improving the management of the patient.[17]

Even though studies have evaluated breast cancer risk factors in Asia or particularly in India; to describe the complete range of risk factors for the radically elevated incidence, efforts are still needed. Furthermore, obvious heterogeneities are exhibited by the epidemiology of breast cancer across different regions of India. For collaborative studies and planning of preventive strategies, it is significant to have baseline data. Thus, in this survey, we aimed to examine the frequency distribution of BIRADS classification and breast consistencies during the mammographic screening program in the Gwalior region, India.

Material and Methods

A descriptive cross-sectional survey was conducted in the Gwalior region, India, for which patients were screened with the aid of mammography from January 2018 to June 2020 after acquiring the ethical clearance from the institutional ethical committee. A single investigator was informed regarding the study objectives and the mammographic imaging of the willing patients was used for the research.

Contralateral breast image was evaluated for the patients with a history of unilateral breast carcinoma and mastectomy. The patients with incomplete or inaccessible profiles or history of bilateral mastectomy were not included in the study. A total of 1,838 females were screened and their data were used for the study.

A single radiologist, who was pre-calibrated, assessed all the mammography films and determined the BIRADS score along with breast composition.[8,13] The presence of any other abnormal findings (such as accessory nipples, microcalcifications) were also recorded.

Statistical methods

The data were tabulated into MS Excel (MS Office version 2007 developed by Microsoft, Redmond, WA), and then, descriptive analysis was performed to determine the frequencies and percentages. To determine the association between the BIRADS score and breast consistency, a Chi-square test was performed and the level of significance was kept below 0.05.

Results

A total of 1,838 patients' mammograms were assessed in this investigation with the age range from 32 to 73 years (mean age: 54 ± 6.3 years).The most commonly found BIRADS score was score 1 (53.4%), followed by score 2 (20.4%), and score 5 was of least frequency (1.3%) [Table 1].

The most common consistency found was fatty (48.2%) and the least common was heterogeneously dense (3.97%) [Table 2].

The most BIRADS category of 0 was seen in heterogeneously dense ($n = 22$; 26%) followed by dense breast compositions ($n = 18$; 25%). The most common consistency found with known breast carcinoma (BIRADS 6) patients was the extremely dense breast ($n = 11$; 40.7%). Half of the females ($n = 491$; 50%) with normal findings (BIRADS 1) displayed fatty breast composition. Statistically significant association was found between both variables ($P < 0.05$) [Figure 1].

Table 1: Prevalence of BIRADS score in the study participants

BIRADS score	Frequency	%
0	307	16.70
1	982	53.43
2	376	20.46
3	87	4.73
4	35	1.90
5	24	1.31
6	27	1.47

Table 2: Frequency distribution of breast consistencies in the study participants

Breast composition	Frequency	%
Fatty	887	48.26
Scattered fibroglandular areas	793	43.14
Heterogeneously dense	73	3.97
Extremely dense	85	4.62

Discussion

Worldwide, carcinoma of the breast is one of the commonest malignancies in women with a rapidly growing incidence rate. In this current study, the prevalence of BIRADS classifications and breast consistencies during breast cancer screening in the Gwalior region was determined.

The sensitivity of mammography has been reported more than Magnetic resonance imaging (MRI) in breast cancer screening moreover additional avoidable examinations happen in MRI as compared to mammography.[18] Thus, mammography was used in the present study.

Our results showed that maximum women belonged to BIRADS scores 1 and 2. These findings were in accord with other Indian[6] and Iranian[8] studies. Although percentage distribution wise, slightly more prevalence of score 2 was reported in that Indian study than ours. Regional differences of both studies might have resulted in these differences.

The common breast consistency reported in our study was fatty and the least common was heterogeneously dense. Similar findings were revealed by Sirous M *et al.* in 2018[8]

The standardized reporting format of BIRADS permits even non-radiologist including primary caregivers to follow through the mammographic reports developed anywhere easily. This system has evolved the consistency in radiology reporting along with being efficient and delivering a cost-effective approach which will be used in the foreseeable future.[18] The early finding and prevention is a vital part of halting the disease progression and improving the patients' quality of life. Thus, such prevalence studies and screening programs are required for planning the preventive strategies and effective management of breast cancers.

Limitations

The cross-sectional nature of the study also affects the outcomes and should be considered while interpreting the results. Moreover, the data were collected only from one region thus limiting the generalizability of the findings.

Conclusion

In this study, a total of 1,838 patients were screened with the aid of mammography and it was observed that 57.3% of all the cases were categorized as BIRADS 1 and 20.8% as BIRADS 2.

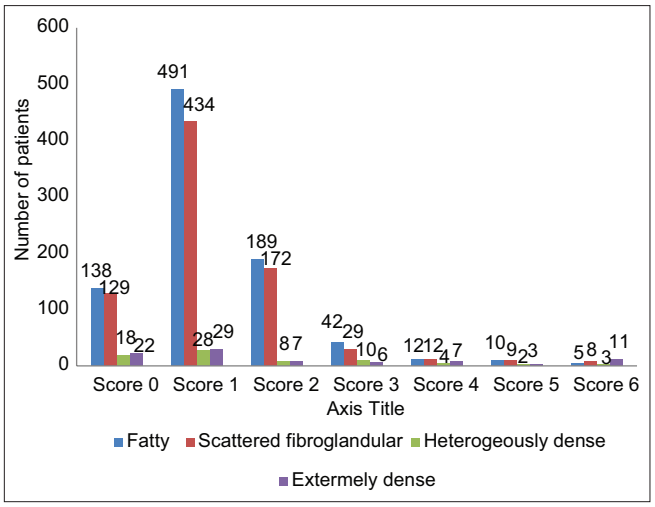

Figure 1: Distribution of BIRADS score and breast consistency in the study participants

Knowing the prevalence of disease burden aids in the preparation of new treatment strategies and structuring of innovative policies. There is a need to do further longitudinal studies to evaluate the benefits of such screening programs in the region.

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Conflicts of interest

There are no conflicts of interest.

References

1. Boyle P, Levin B. World Cancer Report 2008. France: International Agency for Research on Cancer (IARC); 2008. World Health OrganizationPress.
2. Ferlay J, Bray F, Parkin DM, Pisani P. Globocan 2000: Cancer Incidence and Mortality Worldwide version 1.0. IARC Cancer Bases No. 5. Lyon: IARC Press; 2001.
3. Ferlay J, Shin HR, Bray F, Forman D, Mathers C, Parkin DM. GLOBOCAN 2008 v1.2, Cancer Incidence and Mortality Worldwide: IARC Cancer Base No. 10. 2010. Availa ble from: http://www.globocan.iarc.fr.
4. Murthy NS, Chaudhry K, Nadayil D, Agarwal UK, Saxena S. Changing trends in incidence of breast cancer: Indian scenario. Indian J Cancer 2009;46:73-4.

5. Agarwal G, Ramakant P. Breast cancer care in India: The current scenario and the challenges for the future. Breast Care (Basel) 2008;3:21-7.
6. Takkar N, Kochhar S, Garg P, Pandey AK, Dalal UR, Handa U. Screening methods (clinical breast examination and mammography) to detect breast cancer in women aged 40–49 years. J Mid-life Health 2017;8:2-10.
7. Agarwal G, Ramakant P, Forgach ER, Rendón JC, Chaparro JM, Basurto CS, *et al.* Breast cancer care in developing countries. World J Surg 2009;33:2069-76.
8. Sirous M, Shahnani PS, Sirous A. Investigation of frequency distribution of breast imaging reporting and data system (BIRADS) classification and epidemiological factors related to breast cancer in Iran: A 7-year study (2010-2016). Adv Biomed Res 2018;7:56.
9. Brewer HR, Jones ME, Schoemaker MJ, Ashworth A, Swerdlow AJ. Family history and risk of breast cancer: An analysis accounting for family structure. Breast Cancer Res Treat 2017;165:193-200.
10. Collaborative Group on Hormonal Factors in Breast Cancer. Menarche, menopause, and breast cancer risk: Individual participant meta-analysis, including 118964 women with breast cancer from 117 epidemiological studies. Lancet Oncology 2012;13:1141-51. doi: 10.1016/S1470-2045 (12) 70425-4.
11. Bhoo-Pathy N, Yip CH, Hartman M, Uiterwaal CS, Devi BC, Peeters PH, *et al.* Breast cancer research in Asia: Adopt or adapt Western knowledge? Eur J Cancer 2013;49:703-9.
12. Sung H, Rosenberg PS, Chen WQ, Hartman M, Lim WY, Chia KS, *et al.* Female breast cancer incidence among Asian and Western populations: More similar than expected. J Natl Cancer Inst 2015;107:djv107. doi: 10.1093/jnci/djv107.
13. Ye DM, Li Q, Yu T, Wang HT, Luo YH, Li WQ. Clinical and epidemiologic factors associated with breast cancer and its subtypes among Northeast Chinese women. Cancer Med 2019;8:7431-45.
14. Gudenkauf LM, Antoni MH, Stagl JM, Lechner SC, Jutagir DR, Bouchard LC, *et al.* Brief cognitive-behavioral and relaxation training interventions for breast cancer: A randomized controlled trial. J Consult Clin Psychol 2015;83:677-88.
15. Screening for Breast Cancer. Geneva: World Health Organization; 2009. Available from: http://www.who.int/cancer/detection/breastcancer/en/index.html.
16. Sickles EA, D'Orsi CJ, Bassett LW, *et al.* ACR BI-RADS®Atlas, Breast imaging reporting and data system. Reston, VA: American College of Radiology; 2013. p. 39-48.
17. Türk G, Özdemir M, Çoban M, Koç A. Is biopsy necessary? Role of DCE-MRI in BIRADS-3 lesions. Diagn Interv Radiol 2020;26:552-6.
18. Nasrollahzadeh M, Delshad MS, Mansour-Ghanaei R, Maleki Z, Joukar F, Hassanipour S, *et al.* The prevalence, epidemiology and screening results of breast cancer in women of Guilan province, north of Iran: A cross-sectional study during 2017–2018. Clin Epidemiol Global Health 2020;8:P1011-6.