Review

What effect does mammographic breast density have on lesion detection in digital mammography?

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Effective detection of breast cancer using mammography is an important public health issue worldwide. Breasts that contain higher levels of fibroglandular compared with fatty tissue increase breast radio-opacity making it more difficult to differentiate between normal and abnormal findings. The higher prevalence of breast cancer amongst women with denser breasts demands the origination of effective solutions to manage this common radiographic appearance. This brief review considers the impact of higher levels of density on cancer detection and the importance of digital technology in possibly reducing the negative effects of increased density.

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Introduction

High mammographic breast density (MBD) has been shown to be a significant predictor of breast cancer risk, having been linked with a four- to sixfold increase in lifetime risk.1–4 Byrne et al.2 found that more than 18% (66 of 354) of cancerous lesions occurred in women with more than 75% MBD and 44.1% occurred in women with more than 50% MBD. Women with low MBD had a lower rate of breast cancer (3.5 cases per 1000 women) than women with high MBD (11.5 cases per 1000 women).5 The majority of previously published studies has used breast images that have been acquired using conventional screen-film mammographic systems, which has been the primary imaging technique for the breast since the introduction of screening programmes in the early 1970s, although it has been used for many decades.6 However, the advent of digital mammography in January 20007 has introduced many changes to the screening environment, and today in many countries, including Australia, all screening is carried out in a complete digital environment. Given this shift, it is important to ask whether the evidence compiled using analogue technology is still valid in the digital domain, particularly considering emerging new evidence that the limitations faced by radiologists when examining dense breast tissue may not now hold true.

This review addresses the question of whether radiologists face the same set of challenges when reading digital mammograms as they did when reading screen-film, and whether the association of mammographic breast density and risk has to be reassessed in the light of modern digital technology.

Background

The mammographic appearance of breast tissue varies between women according to the differences in breast tissue composition and their x-ray attenuation coefficient.8
Basically, the breast consists of two types of tissue, fat and fibroglandular, which are represented by light and dark areas on a mammogram. MBD is a term used to define the portion of a standard mammographic view that comprises fibroglandular tissue. Examples of breasts with different mammographic densities are shown in Fig 1. Changes in MBD are associated with a variety of factors including age, heritability, use of hormone-replacement therapy, parity, and body mass index. The association of each of these factors with MBD has been reviewed previously.3,9,10

The first study to show a link between high MBD and breast cancer risk was reported in 1976, when Wolfe qualitatively classified mammographic images into glandular density patterns, and showed an association with breast cancer risk.11,12 Since that time, a large number of studies have shown that increased MBD is associated with higher breast cancer risk, and this is consistent when MBD is classified using qualitative5,13,14 or quantitative measures.1,15–20

One of the reasons behind this association has been related to the effect of the MBD masking the lesion, obscuring visibility, and therefore, reducing the radiologist’s ability to detect the lesion. Various studies have shown that the efficacy of mammographic imaging is reduced when the images have high MBD, which will be reviewed in the following sections.

**Assessment methods for MBD**

Many breast density measurement methods have been introduced, however, some are subjective and qualitative, and others are quantitative measures. This review will cite the most common breast density measurements.

Subjective methods include Wolfe’s grading, Tabar, Breast Imaging Reporting and Data System (BIRADS), and visual estimation. Wolfe’s grading includes four breast

![Figure 1](image-url)  
**Figure 1** Variation in density. (a) Density < 25%; (b) density 25–50%; (c) density 51–75%; and (d) density >75%.  

includes six categories to classify MBD: 0% (predominately fatty breast), P1 (fibroglandular tissue), P2 (fibroglandular tissue prominence in less than or more than one-fourth, respectively), and D (extensive fibroglandular tissue “dysplasia”). Tabar classification has five grading levels: I (scalloped contours and Cooper’s ligaments), II (evenly scattered terminal ductal lobular units), III (oval-shaped lucent areas), IV (extensive nodular and linear densities throughout the breast), and V (homogeneous structureless fibrosis with convex contours). The BIRADS system has four categories of MBD: BIRADS 1 (predominately fatty breast), BIRADS 2 (scattered fibroglandular tissue), BIRADS 3 (heterogeneously dense breast tissue), and BIRADS 4 (extremely dense breast tissue). Lastly, visual estimation aims to visually quantify the proportion of the breast area occupied by the fibroglandular dense tissue and represents it as a percentage. This method includes six categories to classify MBD: 0%, <10%, 10–25%, 26–50%, 51–75%, and >75%.

On the other hand, quantitative measures include planimetry and interactive thresholding computer-assisted methods. Planimetry is a technique that uses a device called a planimeter that measures the area occupied by the fibroglandular dense tissue by tracing around it and then dividing it by the total breast area to obtain the fractional area of the breast occupied by the dense tissue. Computer-assisted methods, such as the Cumulus program, are based on interactive thresholding. Interactive thresholding is based on selecting two grey level thresholds that represent the edge of the breast tissue and the edge of the fibroglandular dense tissue, respectively. The software calculates the areas inside these two edges, which are classified as the breast and the dense area. The percentage of MBD using this program is calculated by dividing the dense area by the total breast area. At present, qualitative methods are mostly used for research and are not used in the clinical practice.

Although qualitative measures are easy to apply, they are subjective and depend directly on the radiologist’s opinion. Although qualitative measures have excluded the subjective effect, they are still considered semi-objective techniques. Thus, perhaps a compromise solution, which takes some input from the radiologists, would be the best way to measure breast density. These semi-automated methods use digitized or digital images and require a trained observer, but they are time-consuming. Many studies have developed various techniques to automatically measure MBD based on thresholding, cluster, boundary tracking, pixel grey levels, texture-based techniques, etc. However, no software resulting from a semi-automated approach is currently in widespread use.

Radiologists’ performance and MBD

A number of studies have shown that the sensitivity of the radiologist to detect breast cancer decreases with increasing MBD, with cancer detection decreasing to between 30% and 64.4% in high-density breasts compared to 80–98% in low-density breasts. Studies have examined the combined effect of age and breast density on mammographic sensitivity and have generally shown better performance in low MBD images compared with high MBD images in both young and old age groups. Rosenberg et al. showed, for example, that although sensitivity in women aged <50 years with fatty breasts was 19% higher than those with dense breasts, for women >50 years the sensitivity was only 8% higher in fatty breasts than in dense breasts. Kerlikowske et al. showed that the sensitivity in women aged <50 years was not significantly lower in high MBD images (85.4%) compared with low MBD images (81.1%); however, the latter result may be accounted for by low statistical power as only nine cancer patients were included in the study. Kolb et al. showed a correlation between age and a reduction in mammographic sensitivity for women with high MBD images. They showed that in high MBD images in women <50 years, sensitivity was 50% compared to the 70.2% in women ≥50 years (p < 0.035). However, such age-dependency does not exist for low MBD images. A study by Chiu et al. found that dense breasts had lower sensitivity than less dense breasts (62.8% versus 82%), and this lower sensitivity effect of dense breast tissue compared to less dense breast tissue was significant regardless of age. In the <50 years age group, sensitivity in women with fatty breasts was 76.8% and decreased to 55.3% in high-density breasts. Indeed, a similar reduction in women aged >50 years was found, with a sensitivity of 88.7% in women with fatty breasts, which decreased to 77.7% in women with dense breasts.

Specificity, namely, the correct identification of normal cases, has also been used as an indicator of mammographic performance, although not as often as sensitivity. Evidence suggests that specificity is decreased in breasts with higher density, with values shifting from 89.6–89.9% in women with extremely dense breasts to 93.5–96.5% in women with almost entirely fatty breasts, and this pattern has been found for both older and younger women. Lehman et al. also found that women with extremely high MBD were more likely to have a false-positive (FP) mammogram (10.4%) than women with fatty breast tissue (6.5%). Similar results have been found in a more recent study in which FP values increased from 3.8 in low to 5.9 in high breast density. Cook et al. found that women with high MBD were more likely to be recalled, and the specificity odds ratio (OR), which measures the association between an exposure and an outcome, decreased from 1.85 in almost entirely fatty breast to 0.86 in extremely dense breast, whilst the positive predictive value (PPV) did not change with breast density.

Ultrasound and magnetic resonance (MR) mammography may increase cancer detection in women with high MBD. Ultrasound sensitivity in dense breasts may be as high as 75.3–85.5%. This technique is effective as a second-line screening tool in women with high MBD and would increase cancer detection sensitivity, if used in combination with mammography, to 97.3%. A second strategy to mitigate the reduced mammographic sensitivity in women with dense breasts is MR imaging. It has been reported that MR imaging of the breasts alone has a sensitivity of 98%, and it is highly recommended to be considered for routine examination in women with dense breasts.

Table 1 summarizes studies examining the impact of breast density on radiologists’ performance.
As well as examining the sensitivity and specificity of imaging systems, there are clinical outcomes, which have been assessed as a way of showing that increased mammographic density has an effect on cancer detection.

**Tumour size and MBD**

Tumour size at detection has been shown to increase incrementally with increasing MBD, with a tumour size >1 cm more likely to be in dense breasts as compared to cancers of a smaller size, with ORs of 2 and 2.3 for tumour sizes of 1.1–2 cm and 2.1–10 cm, respectively. Rouibidoux et al. found the average tumour size to be 11.3 mm in low-density breasts and this increased to 19.7 mm in high-density breasts. In agreement with these findings, Nickson and Kavanagh reported that compared women who had a dense area of <7.8% of the total breast, tumours were 2.2 and 6.6 mm larger in the groups with breast densities of 7.8–18.4% and >52%, respectively. Further work has shown that the numbers of screen-detected cancers >15 mm increase with increasing MBD, and women with high MBD have a fourfold

### Table 1

Summary of studies examining the impact of breast density on radiologists' performance.

<table>
<thead>
<tr>
<th>Study</th>
<th>Number of women</th>
<th>Density</th>
<th>Aims</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>28,271</td>
<td>BIRADS</td>
<td>Effect of age, breast density and family history on the sensitivity of first screening mammography</td>
<td>Women &lt; 50 years BIRADS 1 &amp; 2 3 &amp; 4 Sensitivity 81.8 85.4 OR &lt; 0.01 3 &amp; 4</td>
</tr>
<tr>
<td>29</td>
<td>109,320</td>
<td>BIRADS</td>
<td>Factor affect screening mammographic sensitivity and cancer stage at diagnosis</td>
<td>No statistical comparison was carried</td>
</tr>
<tr>
<td>33</td>
<td>1779</td>
<td>Percent BIRADS</td>
<td>Factors affecting sensitivity and specificity of screening mammography and MRI in women with an increased risk of breast cancer</td>
<td>No statistical comparison was carried</td>
</tr>
<tr>
<td>26</td>
<td>165</td>
<td>Japanese 4 grading BIRADS</td>
<td>Compare between ultrasound and mammography for detecting invasive and non-invasive breast cancer in women aged 30–39 years</td>
<td>No statistical comparison was carried</td>
</tr>
<tr>
<td>27</td>
<td>537</td>
<td>BIRADS</td>
<td>The relationship between mammographic breast density and interval cancer risk</td>
<td>Sensitivity 80.3 58.8 30.4</td>
</tr>
<tr>
<td>30</td>
<td>11,130</td>
<td>BIRADS</td>
<td>Comparison between screening mammography, physical examination, and ultrasound and evaluate the factors that affect them.</td>
<td>No statistical comparison was carried</td>
</tr>
<tr>
<td>28</td>
<td>329,495</td>
<td>BIRADS</td>
<td>The relationships between breast density, age, and use of hormone replacement therapy on mammographic accuracy</td>
<td>No statistical comparison was carried</td>
</tr>
<tr>
<td>35</td>
<td>111</td>
<td>BIRADS</td>
<td>Diagnostic accuracy of mammography, clinical examination, ultrasound and magnetic resonance in preoperative assessment of breast cancer</td>
<td>No statistical comparison was carried</td>
</tr>
<tr>
<td>51</td>
<td>576</td>
<td>BIRADS</td>
<td>Factors decreasing the sensitivity of mammography in young women</td>
<td>No statistical comparison was carried</td>
</tr>
<tr>
<td>25</td>
<td>165</td>
<td>Japanese 4 grading BIRADS</td>
<td>Compare between ultrasound and mammography for palpable and nonpalpable breast cancer in women aged 30–39 years</td>
<td>No statistical comparison was carried</td>
</tr>
<tr>
<td>47</td>
<td>1569</td>
<td>BIRADS</td>
<td>Compare current best practice with computer-aided-detection</td>
<td>No statistical comparison was carried</td>
</tr>
<tr>
<td>34</td>
<td>638,947</td>
<td>BIRADS</td>
<td>Impact of women's breast cancer risk factors on radiologists performance</td>
<td>No statistical comparison was carried</td>
</tr>
<tr>
<td>74</td>
<td>First round 1086, Subsequent round 471 Cumulus</td>
<td></td>
<td>Effect of hormone replacement therapy and mammographic density on mammographic sensitivity</td>
<td>No statistical comparison was carried</td>
</tr>
<tr>
<td>31</td>
<td>15,658</td>
<td>Tabar</td>
<td>Baseline breast density effect on cancer incidence, stage, mortality and the natural course of it</td>
<td>No statistical comparison was carried</td>
</tr>
</tbody>
</table>

BIRADS, Breast Imaging Reporting and Data System; OR, Odd Ratio; MRI, magnetic resonance imaging.
increased risk of large cancer detection compared with those who have low MBD.46 Another study found that mean tumour size in the test set increased with increased breast density from 16.3 mm in low-density breasts to 33.4 mm in high-density breasts.47 Table 2 summarizes studies investigating the relationship between tumour size and MBD.

**Interval cancer detection and MBD**

Interval breast cancers are defined as a cancer diagnosed between screening examinations; this is after a negative screening mammogram.48 Interval cancer rates are an expression of sensitivity and are classified into three types based on tumour visibility at the time of mammographic screening. False-negative interval cancers are visible on the prior screening mammogram, but were not reported when the case was originally read. True interval cancers do not have any visible signs on the prior screening image. Finally, occult interval cancers are not mammographically detectable at the time the mammogram is taken, or even on the diagnostic mammogram, despite being clinically detectable.

A significant number of tumours (41%) arising in high MBD images have been shown to be mammographically occult49 and this rate is statistically significant

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Table 2

<table>
<thead>
<tr>
<th>Study</th>
<th>Number of women</th>
<th>Density</th>
<th>Aims</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>42</td>
<td>19152</td>
<td>Optical review; ≤25% Lucent, &gt;25% dense</td>
<td>Effect of mammographic breast density on mammographic screening performance</td>
<td>Screening rounds 2–4 Fatty % Dense % Screening rounds 5–10 Fatty % Dense %</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Size (cm)</td>
<td>≤1</td>
</tr>
<tr>
<td>39</td>
<td>875</td>
<td>Wolfe grade</td>
<td>To investigate the relationship between tumour characteristics and mammographic patterns and the association of it with the risk of in-situ and invasive breast cancer</td>
<td>Size (mm) Fatty (numbers) Dense (numbers)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1–14</td>
<td>120</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>15–29</td>
<td>102</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>≥30</td>
<td>19</td>
</tr>
<tr>
<td>44</td>
<td>121</td>
<td>BIRADS</td>
<td>To evaluate the relationship between mammographic density to estrogen receptor status, grade, size and method of detection of tumour.</td>
<td>BIRADS</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.13</td>
</tr>
<tr>
<td>43</td>
<td>546</td>
<td>BIRADS</td>
<td>To evaluate the association between mammographic density and tumour characteristics</td>
<td>Size (cm) Fatty % Dense %</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.1–1.0</td>
<td>39.6</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>1.1–2.0</td>
<td>43.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2.1–10</td>
<td>17.3</td>
</tr>
<tr>
<td>75</td>
<td>434</td>
<td>BIRADS</td>
<td>The accuracy of tumour size assessment and investigate the association between tumour characteristics and breast density</td>
<td>BIRADS</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.42</td>
</tr>
<tr>
<td>40</td>
<td>759</td>
<td>BIRADS</td>
<td>The effect of mammographic parenchymal pattern on mammographic and pathologic features of screen detected and interval cancers</td>
<td>BIRADS</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>≤10</td>
<td>13</td>
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<td></td>
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<td>11–15</td>
<td>17</td>
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<td>21–25</td>
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<td></td>
<td></td>
<td></td>
<td>≥26</td>
<td>27</td>
</tr>
<tr>
<td>46</td>
<td>7343</td>
<td>Computer assisted method</td>
<td>Improving breast cancer screening outcome by using mammographic density</td>
<td>Percent density % Tumour size</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>≤15 mm OR</td>
<td>1.14</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>≥15 mm OR</td>
<td>2.76</td>
</tr>
<tr>
<td>47</td>
<td>1569</td>
<td>BIRADS</td>
<td>To compare mammography versus computer-aided detection for detection invasive cancers</td>
<td>BIRADS</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>16.3</td>
</tr>
<tr>
<td>45</td>
<td>1348</td>
<td>Computer assisted method</td>
<td>To compare the association between breast density and tumour size</td>
<td>Percent density % Mean size (mm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;3.6</td>
<td>3.6–9.2</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>12.4</td>
<td>14.1</td>
</tr>
<tr>
<td>76</td>
<td>1836</td>
<td>Computer assisted method</td>
<td>To determine the relationship between breast density and breast cancer risk according to tumour characteristics</td>
<td>Percent density % Tumour size</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>≤2 cm OR</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&gt;2 cm OR</td>
<td>1</td>
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</tbody>
</table>

BIRADS, Breast Imaging Reporting and Data System; OR, odd ratio.
increased from 20.5% for entirely fatty to 57.1% for dense breasts, whilst for older women (>50 years) it increased from 20.5% for entirely fatty to 57.1% for extremely dense breasts. A study by Chiarello et al. suggested that breast density is associated with interval cancers and was specifically linked to true-interval cancers that were potentially completely hidden by increased breast density rather than those missed intervals cancers that might have been slightly obscured but still visible on retrospective review. This was confirmed by Mandlelson et al. who showed a significant association between density and true-interval cancers and a non-significant association between breast density and missed interval cancers. Van Gils et al. showed that the occurrence of interval cancers after an initial examination became more noticeable in the first 2 years for dense breast tissue compared to fatty breast tissue, which were found to be non-remarkable 2 years after initial examination. This result shows that the average time for interval cancer diagnosis after initial examination was 2.79 years for high MBD images, which was lower than the 3.14 years for low MBD images. Similar results were reported by Chiu et al. who found that tumours in dense regions of high MBD images are significantly more likely to be interval cancers (p = 0.02).

Evidence suggests that the association between high MBD and decreased sensitivity and specificity of mammography is due to high MBD causing delayed detection of breast cancer and correspondingly larger and more advanced tumours. It has also been suggested that the development of tumours are influenced by their microenvironment, which is in some way represented by the radio-opacity of the breast tissue. High MBD is the manifestation of an environment conducive to fast tumour growth, and hence larger and more advanced tumours at detection. The factors that lead to an increased risk of breast cancer after 12 months of a negative mammographic screening examination are not yet known, for example, whether it is due to the masking effect of high MBD or to the rapid tumour growth in high MBD tissues. Boyd et al. found that the positive association between high MBD and breast cancer risk could not be explained by the hypothesis of breast cancer being masked by dense tissue in the baseline mammogram. Similar results had been found previously. Using deterministic models, Harrison et al. suggested that the association between mammographic density and more advanced tumour stage is more likely to be a result of a biological relationship, but this did not rule out the effect of the decreased mammographic sensitivity and a longer time to detect the cancer. This is supported by the finding of a positive relationship between breast density and tumour size, which was only presented in screen-detected tumours. Therefore, this supports the biological relationship rather than mammographic masking effect.

Digital mammography performance and MBD

Digital mammography is now replacing conventional screen-film mammography in most countries. In digital mammography the process of image acquisition, display, and storage are performed independently and each function is optimized individually. Unlike screen film mammography, where intensifying screens are used to amplify the exposure and convert x-ray to light photons to form the mammographic image on a film, in digital mammography, images are captured as electrical signals that are converted to digital data. Digital mammography offers a linear dynamic range of operation, resulting in high contrast resolution, which enhances the representation of all breast tissues and increases exposure latitude. Therefore, exposure factors are not an issue in digital mammography as they are in screen film mammography. In addition, the soft-copy image display and soft-copy reading of mammograms allows grey-scale adjustment to optimize image contrast, zooming in the area of suspicion, as well as panning. With all these advantages of digital mammography over screen film mammography, it is hypothesized that lesion detection should be increased, especially for lesions hidden on screen film mammography by dense normal fibroglandular tissue.

Several studies have compared the diagnostic efficacy of digital mammography and screen film mammography. Overall, the findings suggest that digital mammography led to better detection of breast lesions, regardless of whether they were invasive cancer, ductal carcinoma in situ, cancers depicted as calcification, or masses. However, for architectural distortion lesions, some data suggest that there is a trend toward better detection with screen film compared to digital mammography. Nonetheless, the differences observed so far are not significant, and in a more recent study, Hambly et al. showed that cancer detection of architectural distortion was significantly higher in digital compared to screen film mammography. This discordant finding could be because of the small numbers of samples in previous studies (in Lewin et al. compared to 1013 (in Hambly et al.) and the continued advances in the digital technology.

Evidence suggests that digital technology offers benefits specifically related to breast density. Studies have found that full-field digital mammography has better visualization of dense breast tissue and higher performance, as measured by the area under the receiver operating characteristic (ROC) curve (AUC) analysis compared with screen film mammography, particularly in three subgroups: women <50 years, pre- and perimenopausal women, and women with heterogeneously or extremely dense breasts. For women with heterogeneously or extremely dense breasts, digital mammography showed an increase in performance of 11% compared with screen-film technology. With the data adjusted for patient age, lesion type, and mammography system, the odds of a cancer being more visible on a digital mammogram, rather than being
equally visible on digital and screen-film mammograms were significantly greater for women with dense breasts than for women with fatty breasts.\textsuperscript{72}

To date, no studies have been carried out to determine radiologist performance in fatty and dense breast when using digital mammograms. However, many studies have been carried out to compare digital and screen-film mammography, and from these a few reported incidental findings that pertained to breast density.\textsuperscript{72}\textsuperscript{71}\textsuperscript{7} The results of the Digital Mammographic Imaging Screening Trial (DMIST),\textsuperscript{71} showed that sensitivity and AUCs increased in women with high compared with low-density breasts, specifically for a certain age group of post-menopausal women. For women aged 50–64 years, the AUC increased from 0.73 in the low breast density group to 0.77 in high-density breasts and the sensitivity was 0.44 in low compared to 0.55 in high breast density group. However, in women aged > 65 years, the AUC value increased in high (0.82) compared to low (0.71) density breasts. In a US community practice setting, a study by Kerlikowske et al.\textsuperscript{68} showed a higher sensitivity in women with extremely dense breasts (83.6%) compared to 78.3% in women with fatty breasts. In a more recent study comparing radiologists’ performance between digital mammography and integrated two-dimensional (2D) and three-dimensional (3D) digital mammography in a population-based breast cancer screening by Ciatto et al.,\textsuperscript{73} false positive rates were lower in high mammographic density images with only 32 marks compared to the 109 FPs scored in low-density breast mammograms.

Conclusion

High MBD has been found to lead to lower sensitivity in breast cancer detection. Recent studies suggest that an increased performance can be achieved using digital mammography compared with screen-film technology in women with high MBD breasts. Therefore, there seems to be a possibility that the determined effect of high MBD could be overcome with the sophisticated post-processing and increased image quality that digital technology can provide. Hence, the impact of digital technology on detection of cancer in breasts of varying density needs to be further explored.

Acknowledgment

The authors thank Dr Warwick B. Lee, Mariusz W. Pietrzyk, Warren M. Reed, and Yanpeng Li for their invaluable editorial and writing assistance. D. S. Al Mousa was sponsored by Jordan University of Science and Technology.

References


