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Presentation of self-detected breast mass in minority women with limited access to care: can self-examination assist in early cancer detection?

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Abstract

Objective: The United States Preventive Services Task Force recommends against breast self-examination. However, racial disparities exist in mammogram screening. We aimed to evaluate the presentation of women with newly diagnosed breast cancer in the underserved African-American and Hispanic community to provide insight regarding breast cancer screening in this population.

Methods: This retrospective cohort study included women newly diagnosed with breast cancer from 1/1/2016 to 1/1/2018 in an inner city public community hospital. Data was collected via chart review. Patients were divided based on whether they presented with self-detected breast mass. Logistic regression was used for analysis.

Results: 59 women were newly diagnosed with breast cancer. 34 women (58%) were African-American, 20 (34%) were Hispanic, and 5 (8%) were other race. Of 59 women, 36 (61%) presented with self-detected breast mass, and only 21 (36%) reported prior mammography. For women who presented with breast mass, the odds of having prior mammography were 78% lower (OR=0.22, 95%CI 0.07–0.69, p=0.009), while the odds of having invasive ductal carcinoma were 4.33 times higher (OR=4.33, 95%CI 1.09–17.25, p=0.037), as compared to the odds for women not presenting with breast mass.

Conclusion: Many of our newly diagnosed breast cancer patients were African-American or Hispanic women presenting with self-detected breast mass without prior screening mammography. Further studies should evaluate whether supplemental screening methods, such as breast self-examination or clinical examination, can help with early breast cancer detection in minority

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women with limited access to care, and such disparities should be considered by organizations when creating screening guidelines.

Keywords

breast cancer; screening; breast self-examination; African American; Hispanic

Introduction

Breast self-examination (BSE), clinical breast examination (CBE), and mammography all have been used alone or in combination for the screening of breast cancer. However, the most recent 2016 guidelines from the U.S. Preventive Services Task Force (USPSTF)[1] and the American Cancer Society (ACS)[2] no longer recommend BSE or CBE as a screening method for average-risk women of any age in the United States (US). On the other hand, the American College of Obstetrics and Gynecology (ACOG)[3] and the National comprehensive cancer network (NCCN)[4] recommends CBE every 1–3 years for women between 25 and 39 and annually for women 40 years and older, but BSE is not recommended for average-risk women due to a lack of evidence of benefit. BSE is a process whereby women examine their breasts regularly to detect any abnormal swelling or lumps in order to seek prompt medical attention. CBE is the examination of a woman's breast by health care professionals who are trained to recognize abnormalities and warning signs in the breast[5]. Earlier studies have suggested that BSE and CBE may reduce breast-cancer mortality and improve survival[6,7]. In addition, patients presenting with palpable masses on SBE or CBE and normal mammograms within 1 year tend to have more aggressive tumors[8]. However, clinical trials of BSE training did not demonstrate lower mortality rates in the BSE group when compared to the controls[9,10]. In addition, false positive BSE or CBE may lead to unnecessary anxiety and worry about the cancer, as well as additional visits to the clinic, unwanted imaging and biopsies[11,12].

However, the USPSTF and ACS recommendations assume that women have access to and are undergoing mammographic screening[1,2], and subsequently should not be presumed to apply in settings where mammographic screening is lacking[13,14]. There is continued use of BSE and CBE to detect breast cancer in underserved parts of the world where screening mammography services are not available. Studies have demonstrated that even in developed countries like the United States, racial disparities exist in the use of screening mammography[15]. Black and Hispanic women are less likely to utilize screening mammography when compared to the white population[15]. It has been shown that access to breast cancer screening and medical care is a significant problem in the inner-city Hispanic community, related to recent immigration, undocumented immigration, and low income characteristics of its members[16]. Our goal is to evaluate the presentation of women newly diagnosed with breast cancer in a community hospital mainly serving an inner city African American and Hispanic population, in order to provide insight of breast cancer screening in low resource settings where minority women may have limited access to care.

Methods

We performed a retrospective cohort study. Adult female patients (≥18 years old) who were newly diagnosed with breast cancer at an inner-city community hospital between 1/1/2016 and 1/1/2018 were included. Patients with prior history of breast cancer were excluded from the analysis, in consideration of the possibility of higher breast cancer awareness and thus different screening patterns. Our community hospital is a public hospital primarily serving the poor and working class in an inner-city African American and Hispanic community, including uninsured city residents and new immigrants. The medical records of women newly diagnosed with breast cancer were reviewed. Age, race, presenting symptoms, imaging findings, pathologic findings, and risk factors were collected from patients' medical records. The outcome of our study was defined as the percentage of women who presented with self-detected breast mass among these newly diagnosed with breast cancer. This study was approved by the institutional review board, and granted a waiver of consent. The study was compliant with the Health Insurance Portability and Accountability Act (HIPAA).

Statistical Analysis

In the univariate analyses, χ^2 tests were used for categorical variables and t-tests were used for continuous variables. To determine whether presentation of self-detected breast mass was independently associated with race, history of prior mammogram screening, and ER/PR/HER-2 status, we conducted the analysis using the logistic regression model. Potential confounding variables listed above were considered and those with $p<0.2$ in the univariate analyses were entered into the final multiple regression model. The adjusted odds ratios (ORs) and 95% confidence intervals (95% CI) were calculated from the logistic regression model to assess the magnitudes of the associations. Significance was based on $\alpha<0.05$ and all hypothesis tests were 2-sided. The analyses were performed using Stata version 11.0 (Stata Corp, College Station, Texas).

Results

From 1/1/2016 to 1/1/2018, 6103 screening mammograms and 3361 diagnostic mammograms were performed on 6148 patients. 73 women had positive biopsy results. Among them, 59 women were newly diagnosed with breast cancer. Among those newly diagnosed with breast cancer, the average age (mean ± SD) at diagnosis was 59±15 years old, and the mean BMI was 29±6. 34 women (58%) were African American, 20 (34%) were Hispanic, and 5 (8%) self-identified as other races. 36 women (61%) presented with self-detected breast mass. Figure 1 shows the diagnostic mammogram of one of the women presented with self-detected breast mass. The mean size of breast cancer was 3.4±2.7 cm measured by ultrasound when masses were identified (n=41). Only 21 women (36%) reported prior screening mammograms in the U.S. based on pre-test questionnaires. 38 women (64%) had invasive ductal carcinoma, which is the most common diagnosis. 10 women (20%) were triple negative for ER/PR/HER-2.

Table 1 shows the characteristics of the women newly diagnosed with breast cancer. Compared to women without self-detected breast mass, those who presented with self-detected breast mass were significantly less likely to report prior screening mammograms

(22% vs. 57%, p=0.007), and significantly more likely to have larger tumor size when masses were identified on ultrasound (4.4±2.8 cm vs. 1.4±1.0 cm, p<0.001). Compared to women who did not present with self-detected breast mass, women who presented with self-detected breast mass were also more likely to be younger, have invasive ductal carcinoma as compared to ductal carcinoma in situ (DCIS), and triple negative cancer, however, the difference were not statistically significant (Table 1).

In the univariate logistic regression as shown in Table 2, for women presented with self-detected breast mass, the odds of reporting prior screening mammography were 78% lower (OR=0.22, 95%CI 0.07, 0.69, p=0.009), while the odds of having invasive ductal carcinoma were 4.33 times higher (OR=4.33, 95%CI 1.09, 17.25, p=0.037), and the odds of having larger tumor size on ultrasound were 3.82 times higher (OR=3.82, 95%CI 1.49, 9.74, p=0.005), as compared to the odds for women who did not present with self-detected breast mass. Variables with p<0.2 in the univariate analyses were entered into the final multiple logistic regression model. The size of tumor was not included in the final model, because not all breast cancer were presented as identifiable masses on ultrasound. After adjusting for the factors in the logistic regression model, for women presented with self-detected breast mass, the odds of reporting prior screening mammography were 74% lower (OR=0.26, 95%CI 0.08, 0.89, p=0.031), as compared to the odds for women who did not present with self-detected breast mass (Table 2).

Discussion

Our public community hospital predominantly serves the inner city African American and Hispanic women who often have limited access to care. Among the women newly diagnosed with breast cancer, only 36% reported prior screening mammography. This is much lower when compared to the national average of 65.3% of women aged 40 and above who received a mammogram in the last 2 years[17]. Growing evidence suggests that limitations in the national survey databases lead to overestimations of mammogram use, particularly among low-income racial and ethnic minorities[18]. A prior study demonstrated that only half of the inner-city women were obtaining regular breast cancer screening[19]. The barriers to obtaining screening mammograms for medically underserved populations include cost, language and acculturation limitations, deficits in knowledge, lack of insurance and medical care[18]. Fear of cost due to no insurance has been reported as the most common reported barrier[20]. Low income minority and inner-city women continue to have relatively low breast cancer screening rates when compared to the general population[21].

In our study, 61% of the women presented with self-detected breast mass. A prior study evaluating symptomatic women with breast cancer has shown that the most common symptom of presentation was breast lump[22]. IDC is more common in woman who presented with self-detected breast mass as compared to those who did not present with self-detected mass in our study. In addition, among the women with masses seen on ultrasound, the size of the primary tumor was larger in the woman who presented with self-detected breast mass as compared to those who did not. African-American women suffer higher breast cancer mortality[23], which may be partially due to the disparities in screening mammography, tumor characteristics at diagnosis, biologic markers, and treatment[24,25]. It has been suggested that

black women, when diagnosed at comparable disease stages as white women and treated appropriately, tend to experience similar breast cancer prognosis and survival[26]. Early detection of breast cancer might decrease the disease burden at the time of diagnosis, and potentially improve prognosis. Regular screening mammography detects breast cancer early and reduces breast cancer mortality[27,28]. Without screening mammography, the breast cancers may progress to later stages with palpable masses. Thus, it is important to establish outreach programs to the underserved communities to provide screening mammography for early cancer detection.

Given the high percentage of women presenting with self-detected breast mass in our study, further study is needed to evaluate whether BSE or CBE in medically underserved populations can help improve breast cancer awareness and overcome cultural barriers to early breast cancer detection. USPSTF does not recommend teaching women BSE[29]. They have also concluded that performing CBE do not offer any additional benefit beyond screening mammograms[29]. However, BSE is the recommended method in developing countries for breast cancer early detection because it is easy, convenient, private, safe and requires no specific equipment[30,31]. In addition, CBE is also considered useful to detect interval cancers detected in between screening mammography studies[8,32]. In our study, women who presented with self-detected breast mass also had higher rate of triple negative cancer. Thus, these women should be counseled about BSE and/or CBE, and encouraged to seek medical care early if they experience a change. Therefore, community outreach with BSE training and complimentary CBE programs may be important to improve early cancer detection in the underserved minority population.

There are several limitations in our study. First, our data was collected via retrospective chart review, and thus, the patients' socioeconomic status, immigration status, insurance coverage and education level were not available in the electronic medical record (EMR). In addition, there was missing data for risk factors of breast cancer in the EMR, such as family history of breast cancer and reproductive history. Thus, we cannot evaluate the impact of these factors on breast cancer screening. Moreover, some of our patients decided to seek breast cancer treatment at different facilities after the initial diagnosis, and thus, we do not have data to assess the pathologic tumor size and lymph nodes status of these patients.

Conclusion

The majority of newly diagnosed breast cancer patients in our inner city hospital mainly serving the underserved minority community were African American or Hispanic women who presented with self-detected breast mass without prior screening mammography. These minority women who presented with self-detected breast mass were significantly more likely to have invasive ductal carcinoma and larger tumor size when masses were detected on ultrasound. Our study suggests that there needs to be outreach to the underserved communities with screening mammography for early cancer detection. In addition, future study is needed to evaluate whether supplemental screening methods, such as BSE and/or CBE, can help to improve breast cancer awareness and early breast cancer detection in minority women with limited access to care, and such disparities should be considered by organizations when creating screening guidelines.

Acknowledgments

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Highlights

- Many African American and Hispanic women diagnosed with breast cancer presented with breast mass.
- There needs to be outreach of screening mammography for early cancer detection.
- Future study should assess if breast self-exam improves detection in minority with limited care.
- Disparities in screening should be considered when creating breast cancer screening guidelines.

Figure 1.

46-year-old woman presenting with a right self-detected breast mass. Right MLO mammography image demonstrates at 12:00, middle depth, a 4.0 cm irregular hyper-dense mass with associated skin thickening and trabecular coarsening. Prominent right axillary lymph nodes are also noted. Biopsy yielded invasive ductal carcinoma with nodal metastasis.

Table 1.

Patient characteristics by presentation of self-detected breast mass

	Total n (%)	Presentation of self-detected breast mass		P value
		Yes (n=36)	No (n=23)	
Age	59±15	57±17	61±9	0.244
Race				0.586
Black	34 (58%)	21 (58%)	13 (57%)	
Hispanic	20 (34%)	13 (36%)	7 (30%)	
Other	5 (8%)	2 (6%)	3 (13%)	
BMI	29±6	29±6	29±6	>0.999
Size of cancer (cm)	3.4±2.7 (n=41)	4.4±2.8 (n=28)	1.4±1.0 (n=13)	<0.001
Self-reported Prior screening	21 (36%)	8 (22%)	13 (57%)	0.007
Pathology				0.088
Invasive ductal carcinoma	38 (64%)	26 (72%)	12 (52%)	
DCIS	12 (20%)	4 (11%)	8 (35%)	
Other	9 (16%)	6 (17%)	3 (13%)	
Triple negative (ER/PR/HER-2)	10 (20%)	7 (23%)	3 (15%)	0.470

Table 2

Unadjusted and adjusted associations between patient characteristics and presentation of self-detected breast mass

Characteristics	Unadjusted		Adjusted	
	OR (95%CI)	p-value	OR (95%CI)	p-value
Age	0.98 (0.94, 1.02)	0.254	NA	
Race				
Black	Reference		NA	
Hispanic	1.15 (0.36, 3.63)	0.812		
Other	0.41 (0.06, 2.81)	0.366		
BMI	1.00 (0.91, 1.10)	0.997		
Size of cancer (cm) (n=41)	3.82 (1.49, 9.74)	0.005	NA	
Self–reported prior screening	0.22 (0.07, 0.69)	0.009	0.26 (0.08, 0.89)	0.031
Pathology				
DCIS	Reference		Reference	
Invasive ductal carcinoma	4.33 (1.09, 17.25)	0.037	3.05 (0.70, 13.22)	0.136
Other	4.00 (0.64, 25.02)	0.138	2.05 (0.28, 14.82)	0.478
Triple negative (ER/PR/HER-2)	0.58 (0.13, 2.57)	0.464	NA	