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Method of Breast Cancer Presentation and Depressed Mood 1 Year After Diagnosis in Women with Locally Advanced Disease

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Abstract

Background—Differences in psychological outcomes of breast cancer patients with locally advanced disease who presented with abnormal screening mammograms or palpable mass have not been reported.

Methods—We interviewed 120 women with clinical stage II/III breast cancer enrolled onto a prospective phase 2 clinical trial at diagnosis and 1 year after diagnosis, inquiring about demographics, depressive symptoms, social support, and perceived risk of disease recurrence. Presentation method (abnormal screening mammogram or symptoms) was determined by chart review. Change in depressed mood was assessed by repeated measures analysis of covariance, grouping by presentation method.

Results—A significant interaction was observed between presentation method and change in depressed mood among 86 women without disease progression who completed both interviews. Women presenting with breast symptoms experienced a decrease and women presenting with abnormal screening mammogram experienced an increase in depressed mood ($P = 0.032$).

Conclusions—Women diagnosed with locally advanced breast cancer by screening mammography showed increased depressed mood a year after diagnosis. Therefore, identification of locally advanced breast cancer by screening mammogram may be a risk factor for posttreatment depression.

Patients diagnosed with breast cancer seek evaluation in one of two ways: asymptotically by an abnormal screening mammogram, or symptomatically with a palpable breast mass or other associated symptoms. These two methods may result in different patient experiences and perceptions regarding their cancers. Patients may seek care with large breast cancers for several reasons, including difficulty of detection in young women, lack of knowledge about the perceived seriousness of breast symptoms, limited knowledge regarding the potential benefits of early detection in improving breast cancer survival, fear of diagnosis, and consequences of cancer treatments. Women with mammographically detected lesions are usually unaware of any pathology within their breast. In this study, we examined the

relationships among patients' experiences of psychological distress, their perceived risk of recurrence, and the method of breast cancer diagnosis.

METHODS

We examined the relationships among method of presentation, perceived risk of recurrence, and depressed mood in a group of 120 women newly diagnosed with clinical stage II/III breast cancer who enrolled onto a phase 2 prospective neoadjuvant clinical trial between March 2003 and March 2006 at a National Cancer Institute–designated comprehensive cancer center. This report presents results of an ancillary study to this trial, which was approved by the institutional review board at our institution. All of the women received identical chemotherapy regimens of epirubicin/docetaxel, four cycles administered before surgery and two cycles after surgery. The experimental treatment was receipt (vs. no receipt) of zoledronic acid, a bisphosphonate previously approved by the U.S. Food and Drug Administration for treatment of bone disease in cancer patients. Participants completed a baseline interview after diagnosis but before the initiation of treatment and a follow-up interview 1 year after diagnosis. All women had completed treatment, including postoperative radiation, at least 4 months before the follow-up interview. Interviews were performed by specially trained interviewers who used a computer-assisted interview data-entry system. We determined the method of breast cancer presentation by retrospective chart review blinded to interview responses and clinical outcomes. Women were classified as presenting asymptotically by abnormal screening mammogram or symptomatically by palpable mass or other symptoms (Table 1). Characteristics of the tumor (size, grade, estrogen receptor, progesterone receptor, and human epidermal growth factor receptor 2 [Her2] status), surgery, reconstruction, postoperative radiation treatment, and response to therapy (estimated by physical examination and radiographically at the discretion of the treating surgeon) were also obtained by chart review. Tumor size was determined radiographically before any treatment.

Previously developed questionnaires were used to evaluate perceived risk of recurrence, perceived availability of social support, and depressed mood. Perceived risk of recurrence was evaluated at follow-up by a single question “What do you think the chances are that you will have this disease again someday?” Interviewers explained further that “recurrence” included developing a new breast cancer in their previously unaffected breast or experiencing recurrent disease in the same breast or developing disease elsewhere in their body.

Perceived availability of social support at baseline was assessed by the Medical Outcomes Study Social Support Survey. Items were rated on a 5-point scale, from 1, “none of the time,” to 5, “all of the time”; higher mean scores indicate more support available. Symptoms of depressed mood were measured by the Center for Epidemiologic Studies Depression (CESD) scale, completed at baseline and at 1-year follow-up. Each symptom is rated on a 4-point scale ranging from 0, “rarely or none of the time (< 1 day)” to 3, “most or all of the time (5 to 7 days).” Total scores can range from 0 to 60, with higher scores indicating more severe depressed mood; CESD scores above 16 are considered suspicious of clinical depression. All patients with CESD scores of > 16 were provided with contact information for psychological treatment and/or referred to their physicians. In addition, we inquired about patients' age at diagnosis and other demographic variables.

All statistical tests were performed by SPSS 14.0.2 (SPSS, Chicago, IL). The level of significance was set at $P < .05$. A χ^2 test measured the relationship between perceived risk of recurrence and presentation method; one-way analyses of variance measured differences in depressed mood, social support, and age by presentation method, history of depression, trial

treatment arm, perceived risk of recurrence, and various treatment and tumor characteristics. Pearson correlations measured the relationships among depressed mood, social support and age. Repeated-measures analysis of covariance (RM-ANCOVA) was used to measure the change in CESD score over time by presentation method, controlling for age, availability of social support, history of depression, and perceived risk of recurrence.

RESULTS

Of the 120 women enrolled onto the clinical trial, 86 women, who were free of recurrence and disease progression of their breast cancer, completed both initial and follow-up interviews and were therefore eligible for our study. Patient and tumor characteristics did not differ significantly by presentation method (Table 2). One woman had no measurable primary tumor, and another had an initial biopsy sample insufficient for hormone receptor analysis. Perceived risk of recurrence did not differ significantly between the two groups ($P = .68$), although a greater proportion of women with mammographically detected lesions perceived their risk of recurrence to be 50% (Fig. 1). Increased incidence of depressed mood (CESD > 16) was reported by 18% of the 86 patients at baseline and by 22% at follow-up. Depressed mood was low, on average, at baseline (12.1 [standard deviation (SD)] 11.2) and at follow-up (10.2 [SD 11.6]). Table 3 shows the mean CESD scores at baseline and follow-up in relation to patient and tumor characteristics. History of depression ($P = .003$) and perceived risk of recurrence ($P = .042$) were significantly associated with depressed mood at follow-up. Also, age ($r = -.217$; $P = .045$) and social support ($r = -.418$; $P < .001$) at baseline were negatively correlated with depressed mood at follow-up. Presentation method, treatment arm of the trial (receipt vs. no receipt of zoledronic acid), race, marital status, employment status, menopausal status, type of surgery, reconstruction, radiotherapy, and response to therapy were not significantly associated with depressed mood at baseline or at follow-up. As illustrated in Fig. 2, in the RM-ANCOVA controlling for age, availability of social support at baseline, history of depression at baseline, and perceived risk of recurrence at follow-up, a significant interaction was observed between method of presentation and change in depressed mood ($P = .032$). Women presenting with a palpable mass or other breast symptoms experienced a decrease in depressed mood at 1 year (12.5 [SD 11.7] to 9.9 [SD 11.8]). In contrast, women presenting with abnormal screening mammogram experienced an increase in depressed mood (9.1 [SD 7.5] to 12.7 [SD 10.1]).

DISCUSSION

Our findings indicate that the method of presentation did not have a significant effect on patients' perceived risk of recurrence, but the method of presentation did result in a different pattern of depressed mood over time. Women who presented with an abnormal screening mammogram experienced an increase in depressed mood 1 year after diagnosis, whereas women who presented with a palpable mass or other breast symptoms experienced a decrease in depressed mood at follow-up. We hypothesize that women who present with a palpable mass are relieved by the receipt of a diagnosis and the initiation of treatment, whereas women who do not suspect any health problems at the time of screening are more negatively affected by the diagnosis. Because our analysis was exploratory and ancillary to the objectives of the parent clinical trial, we cannot attribute a causal relationship to our observation. However, because diagnosis by abnormal mammogram was associated with increasing levels of depressed mood after treatment for locally advanced breast cancer, knowing the method of presentation can help sensitize clinicians to the possibility of developing depression in these patients.

Recognizing that many factors may influence depressed mood, including both patient and tumor characteristics, we controlled for several factors known to be significantly related to

depressed mood, both in our study and in the literature. However, there may be other unmeasured factors that influence depressed mood over time in addition to the method of presentation. We recommend further examining the relationship between method of presentation and depressed mood over time in a larger trial as well as looking at patient and provider characteristics that may be associated with depressive symptoms after breast cancer treatment, including risk of disease recurrence, receipt of psychological and/or pharmacological treatment, and patient satisfaction with cancer treatment.

It is important to note that, on average, the women in this study would not have been considered to be clinically depressed; nevertheless, approximately 20% of patients reported higher levels of depressive symptomatology (CESD > 16), suggestive of clinical depression. Our results indicate that treating physicians should be especially mindful of the distress experienced by women who present asymptotically with a locally advanced breast cancer diagnosis. Because depression has been found to be associated with poorer adherence to cancer treatment recommendations, screening for depression before, during, and after breast cancer treatment is recommended, which will allow identification of patients in need of therapy for their depression.

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Percent of Respondents

FIG. 1.

Patient's perceived risk of breast cancer recurrence at 1-year follow-up by method of presentation (χ^2 test, $P = 0.68$)

Mean CESD Score

FIG. 2.

Change in depressed mood over time by method of presentation. Repeated-measures analysis of covariance was performed to control for age, history of depression, perceived risk of recurrence, and social support ($P = 0.032$)

TABLE 1

Patient characteristics

Characteristic	Value
No. of patients	86
Symptomatic presentation, n (%)	75 (87)
Palpable mass with no other reported symptoms	58 (67)
Palpable mass with other reported symptoms	16 (19)
Pain	7 (8)
Nipple discharge	4 (5)
Change in contour	3 (3)
Erythema	1 (1)
Change in breast contour	1 (1)
Asymptomatic presentation (mammogram), n (%)	11 (13)

TABLE 2

Descriptive patient and tumor characteristics by presentation method

Characteristic	Palpable mass (N = 75)	Mammography (N = 11)	P value
Age (y)			
Mean $\pm$ SD	48.6 $\pm$ 8.9	50.8 $\pm$ 8.1	0.438
Range	31–68	41–67	
Tumor size before treatment (cm)			
Mean $\pm$ SD	3.4 $\pm$ 1.7	2.6 $\pm$ 0.9	0.137
Range	0.7–11.0	1.5–4.2	
Race, n (%)			0.802
White	55 (73.3)	9 (81.8)	
African American	19 (25.3)	2 (18.2)	
Other	1 (1.3)	0 (0.0)	
Tumor grade, n (%)			0.341
I	5 (6.7)	2 (18.2)	
II	32 (42.7)	3 (27.3)	
III	38 (50.7)	6 (54.5)	
Estrogen receptor status, n (%) ^a			0.858
Negative	29 (39.2)	4 (36.4)	
Positive	45 (60.8)	7 (63.6)	
Progesterone receptor status, n (%) ^a			0.312
Negative	39 (52.7)	4 (36.4)	
Positive	35 (47.3)	7 (63.6)	
Her2 status, n (%) ^a			0.442
Negative	61 (82.4)	8 (72.7)	
Positive	13 (17.6)	3 (27.3)	

SD significant difference. Tests of significance are one-way analysis of variance for age and tumor size, and χ^2 tests for race, tumor grade, estrogen receptor, progesterone receptor, and Her2-neu status

^aTumor characteristics were not measured for one woman

TABLE 3
Mean depressed mood (CESD) in relation to patient characteristics, types of treatment, and response to therapy

Characteristic	Total (N = 86), n (%)	CESD baseline		CESD follow-up	
		Mean	P value	Mean	P value
Presentation method					
Symptomatic	75 (87.2)	12.5	0.348	9.9	0.449
Asymptomatic (mammography)	11 (12.8)	9.1		12.7	
Marital status					
Married or part of unmarried couple	56 (65.1)	10.2	0.112	8.8	0.089
Divorced, separated or widowed	24 (27.9)	15.4		11.4	
Single, never married	6 (7.0)	16.2		19.3	
Employment status					
Employed at least part-time	59 (68.6)	11.2	0.287	10.0	0.820
Not employed	27 (31.4)	14.0		10.7	
Race					
White	64 (74.4)	12.7	0.681	9.8	0.790
African American	21 (24.4)	10.5		11.8	
Other	1 (1.2)	7.0		9.0	
Menopausal status					
Premenopausal	49 (57.0)	13.4	0.217	11.8	0.159
Postmenopausal	37 (43.0)	10.4		8.2	
History of depression before diagnosis					
Yes	36 (41.9)	17.1	<0.001	14.6	0.003
No	50 (58.1)	8.5		7.1	
Treatment arm ^a					
Zoledronic acid	42 (48.8)			8.9	0.306
Placebo	44 (51.2)			11.5	
Type of surgery ^a					
Breast conservation	45 (52.3)			10.3	0.956
Mastectomy	41 (47.7)			10.2	
Reconstruction ^a					

Characteristic	Total (N = 86), n (%)	CESD baseline		CESD follow-up	
		Mean	P value	Mean	P value
Yes	30 (35)			9.8	0.796
No	56 (65)			10.5	
Receipt of radiation ^d					
After breast conservation	45 (52.3)			10.3	0.873
After mastectomy	17 (19.8)			11.3	
No radiation	24 (27.9)			9.4	
Pathologic response to chemotherapy ^d					
Complete response	14 (16.3)			8.0	0.608
Microscopic residual disease (≤ 1 cm)	15 (17.4)			8.9	
Macroscopic residual disease (>1 cm)	56 (65.1)			11.1	
Indeterminate ^b	1 (1.2)				
Perceived risk of recurrence ^d					
No chance, 0%	16 (18.6)			9.8	0.024
1%–9%	9 (10.4)			4.0	
10%–24%	12 (14.0)			6.8	
25%–49%	16 (18.6)			6.2	
50%	19 (22.1)			14.3	
>50%	14 (16.3)			16.8	

CESD Center for epidemiologic studies depression scale. Tests of significance are one-way analyses of variance

^d Only follow-up measures of depressed mood in relation to treatment arm, type of surgery, reconstruction, radiation, pathologic response to chemotherapy, and perceived risk of recurrence are reported because these variables were measured after baseline

^b One woman had no measurable primary tumor; therefore, pathologic response could not be determined