

Quality of life and metastatic breast cancer: the role of body image, disease site, and time since diagnosis

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Abstract

Purpose Too little is understood about the quality of life (QoL) concerns of patients diagnosed with advanced disease. While body image has been found to be consistently important for women with early-stage breast cancer, the impact of body image on women with metastatic breast cancer (MBC) is less frequently studied. This cross-sectional study aimed to identify factors affecting QoL in a sample of patients diagnosed with MBC, with particular attention to body image, disease site, and time since diagnosis.

Methods In total, 113 women diagnosed with MBC completed two QoL scales (EORTC QLQ30; EORTC BR23) as part of a larger study. Clinical characteristics were obtained via medical record review. Demographics, disease characteristics, and clinical factors were examined.

Results Time since diagnosis and location of metastases were found to affect patients' QoL, and most strikingly, this effect often differed for those with higher and lower body image. Body image appears to remain highly influential even for those living with a shortened life expectancy.

Conclusions These findings indicate that the development of QoL support should more carefully consider patients diagnosed with MBC and the unique sets of body concerns that affect this population.

Keywords Oncology · Breast cancer · Metastatic · Body image · Quality of life · Middle age

Introduction

Metastatic breast cancer (MBC) is marked by shorter survival intervals and emphasis on palliative care rather than curative interventions. Approximately 25 % of patients diagnosed with MBC survive for 5 years, and of these patients, approximately 10 % remain alive at 10 years [1, 2]. As patients have been found to live longer with advanced disease depending upon the location and extent of metastases [1], quality of life (QoL) issues have become increasingly salient for patients diagnosed with MBC. Research has shown that several factors are key to MBC patients' QoL, including pain, discomfort, anxiety, and depression [3, 4].

We know little about the dimensions of QoL for women with MBC as patients with metastatic disease are often excluded from study samples [5–7]. Reasons for this exclusion vary, including a focus in research on issues of survivorship [e.g., 6, 7] as well as a focus on the long-term implications of interventions and treatments, which require patients to have longer life expectancies than typically found in patients with MBC [e.g., 8].

Three disease characteristics relevant to MBC have been found to affect life expectancy and QoL: location of disease (i.e., where metastases have been found), presence of bone metastases, and time since diagnosis with cancer. Visceral disease¹ has been associated with worse outcomes at recurrence and increased risk of death [9–11]; patients

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¹ Visceral disease includes metastases in the brain, liver, lungs, pericardium, pleura or mediastinum, bowel or peritoneum, or ovaries.

have an estimated 5-year survival of 13 % [12]. Bone metastases—the most frequent site of metastases—have also been associated with worse outcomes; patients' estimated 5-year survival is 23 % [9, 12]. Lastly, the amount of time a patient has been diagnosed with MBC has also been found to predict lower physical QoL [13].

In addition to disease characteristics, body image has been found to be consistently important in studies of early-stage breast cancer [14, 15]. Little is known, however, about how body image affects the QoL of women with MBC. Mosher et al. [16] found that nearly half the women in their MBC sample reported distress about appearance concerns; hair loss, scars, weight gain, lymphedema, and hyperpigmentation of the nail beds were sources of frustration and embarrassment for patients. Body image has been found to be an important predictor of psychosocial outcomes in women with in situ breast cancer [e.g., 17]: Heightened concern with body integrity has been found to predict elevated distress and social disruption [18], and more positive body image correlates with higher self-efficacy in coping with breast cancer and its treatment [19].

This study aimed to assess the impact of disease characteristics and psychological factors on patients' quality of life (QoL) in a sample of women diagnosed with MBC. We hypothesized that several clinical factors (visceral disease, longer time since MBC diagnosis, bone metastases), older age, as well as psychosocial factors (decreased body image) and symptom burden (greater fatigue and pain) would account for variance in QoL outcomes.

Methods

All patients attending a breast cancer practice in a US Comprehensive Cancer center consecutively from September 2011 to June 2012 were screened for a confirmed diagnosis of MBC. To be eligible for this study, female patients were required to be over 21, able to read and speak English, have no major psychiatric illness diagnosis, and have a life expectancy of at least 3 weeks. In total, 192 patients were invited to participate and 113 (59 %) completed a paper and pencil survey. Self-reported age was analyzed using three groups: ages 30–49, 50–65, and 66–85. Age groups were dummy coded for analyses, and age group 2 (50–65) was used as the comparison group. Medical variables were obtained from patients' medical records. All consent procedures were followed as outlined by the University of Michigan's Institutional Review Board (IRB).

Visceral disease was dichotomized: Patients were coded as having visceral disease if they had metastases in one or more of the following: brain, liver, lungs, pericardium, pleura or mediastinum, bowel or peritoneum, or ovaries. Nonvisceral disease was defined as located in bone, lymph

nodes, or skin. Patients were coded as having presence or absence of bone metastases. These two measures of disease site were not mutually exclusive: A patient could have both visceral disease and bone metastases. Time since a patient's diagnosis with MBC was calculated by date of MBC diagnosis as noted in the medical chart and survey completion date.

The EORTC QLQ-30 v.3 [20] and EORTC QLQ-BR23 [21] were administered. In the present analysis, we focused on patients' symptom burden (pain and fatigue), global QoL, physical and emotional function, as well as patients' self-reported body image.

Results

Patients' ages ranged from 30 to 84 ($M = 58$; $SD = 11.61$). Mean time since diagnosis with MBC was approximately 3 years ($M = 36.11$ months; $SD = 39.56$ months). Two-thirds (67 %) of patients were diagnosed with bone metastases, 64 % were diagnosed with visceral disease, and 38 % had diagnoses of both visceral disease and bone metastases. Of the 113 participants, 83 % ($n = 94$) had received chemotherapy: One-quarter ($n = 24$) had received chemotherapy in the metastatic setting, one-third ($n = 33$) in adjuvant setting, and one-third ($n = 37$) in both.

Linear regressions were used to examine relationships between disease characteristics, psychological factors, and QoL. Standardized beta weights, standard errors, R and R^2 values, and p values are in Table 1. Simple slopes were used to evaluate the significance of the slope for the regression of y on x at conditional values of the moderator [22]. Regression coefficients are reported as β , and simple slopes are reported as b .

Global QoL

Experiencing worse symptoms, in this case of pain ($\beta = -0.20$, $SE = 0.06$, $p = .01$) and fatigue ($\beta = -0.44$, $SE = 0.07$, $p < .001$), was associated with decreased global QoL. Age group was unassociated with global QoL, but the interaction between age \times body image was a significant predictor ($\beta = -0.30$, $SE = 0.20$, $p = .02$). The middle-aged group (50–65) reported a significant increase in global QoL as body image increased ($b = 0.22$, $p = .04$). Conversely, the older-aged group (66–85) reported a decrease in global QoL as body image increased, but this slope was nonsignificant ($b = -0.27$, $p = .12$).

The time since MBC diagnosis \times body image interaction was also significant ($\beta = 0.19$, $SE = 0.00$, $p = .04$). Body image was not associated with increased QoL among women who had been diagnosed with MBC more recently

Table 1 Regression coefficients and R^2 for each regression equation with global, physical, and emotional quality of life as the dependent variables

	Global QoL			Physical QoL			Emotional QoL		
	<i>b</i>	β	SE	<i>b</i>	β	SE	<i>b</i>	β	SE
<i>Block 1</i>									
QLQ-C30 pain	-0.17	-0.20*	0.06	-0.10	-0.11	0.08	-0.17	-0.17	0.09
QLQ-C30 fatigue	-0.35	-0.44***	0.07	-0.38	-0.44***	0.09	-0.23	-0.24*	0.09
BR23 body image	0.15	0.21*	0.06	0.04	0.05	0.08	0.27	0.32**	0.08
R^2		0.47			0.27			0.33	
<i>Block 2</i>									
Age group 1 ^a	2.19	0.05	3.56	10.30	0.20*	4.50	1.65	0.03	4.93
Age group 3 ^b	-4.82	-0.10	3.86	-1.56	-0.03	4.97	-4.63	-0.08	5.35
Time since mtx dx ^c	0.00	0.00	0.04	0.02	0.04	0.05	0.02	0.04	0.05
Bone mtx ^d	-3.83	-0.09	3.06	-3.49	-0.08	3.93	1.23	0.02	4.24
Visceral disease	-0.54	-0.01	3.01	-4.65	-0.10	3.87	-1.45	-0.03	4.18
Δ in R^2		0.02			0.06			0.01	
<i>Block 3</i>									
Interactions									
Age group 1 \times body image	-0.04	-0.03	0.16	-0.44	-0.30*	0.20	-0.10	-0.05	0.21
Age group 3 \times body image	-0.49	-0.30*	0.20	-0.32	-0.17	0.26	-0.26	-0.13	0.27
Age group 1 \times fatigue	0.12	0.07	0.18	-0.13	-0.07	0.23	-0.07	-0.03	0.24
Age group 3 \times fatigue	-0.21	-0.11	0.17	-0.13	-0.06	0.22	-0.32	-0.14	0.23
Time Mtx Dx \times fatigue	0.00	-0.03	0.00	0.00	-0.09	0.00	0.00	-0.01	0.00
Time Mtx Dx \times body image	0.00	0.19*	0.00	0.00	0.08	0.00	0.01	0.27**	0.00
Visceral \times body image	0.17	0.18	0.12	-0.02	-0.01	0.16	-0.55	-0.47**	0.17
Visceral \times fatigue	-0.02	-0.02	0.14	-0.25	-0.22	0.19	-0.41	-0.32*	0.19
Visceral \times pain	0.08	0.08	0.14	0.12	0.11	0.18	0.30	0.24	0.19
Δ in R^2		0.07			0.06			0.12*	

Age group 2 (age 50–65) = reference group

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

^a Age group 1 = younger age group 30–49 (coded as 1) versus age group 50–65 (coded as 0)

^b Age group 3 = older age group 66–85 (coded as 1) versus age group 50–65 (coded as 0)

^c Time since mtx dx = time since metastatic diagnosis

^d Bone mtx = bone metastases

(i.e., <36 months; $b = 0.06$, $p = .64$). However, women who had been diagnosed longer than 36 months reported a significant increase in global QoL as body image increased ($b = 0.38$, $p = .005$).

Physical function

Women who reported greater fatigue ($\beta = -0.44$, $SE = 0.09$, $p < .001$) also reported decreased physical function. An interaction between age \times body image ($\beta = -0.30$, $SE = 0.20$, $p = .03$) was a significant predictor of physical function. For women aged 50–65, higher body image was associated with a significant increase in physical function ($b = 0.30$, $p = .04$).

Emotional function

Both fatigue ($\beta = -0.24$, $SE = 0.09$, $p = .02$) and body image ($\beta = 0.32$, $SE = 0.08$, $p = .001$) were significant predictors of emotional function. Greater fatigue was associated with decreased emotional function, while greater body image was associated with increased emotional function. The time since MBC diagnosis \times body image interaction ($\beta = 0.27$, $SE = 0.00$, $p = .01$) suggests that women who had been diagnosed with MBC for a longer period of time (i.e., more than 36 months) reported significantly greater emotional function as body image increased ($b = 0.99$, $p < .001$). Women who had been diagnosed with MBC more recently also reported an

increase in emotional function as body image increased ($b = 0.44, p = .01$), but this effect was stronger for those women who had been diagnosed with MBC longer.

The disease site \times body image interaction was also significant ($\beta = -0.47, SE = 0.17, p = .001$). Women with nonvisceral disease reported a significant increase in emotional function as body image increased ($b = 0.72, p < .001$). Conversely, body image was not associated with emotional function for women with visceral disease ($b = 0.16, p = .26$). In addition, the disease site \times fatigue interaction was a significant predictor of emotional function ($\beta = -0.32, SE = 0.19, p = .04$). For women with visceral disease, emotional function significantly decreased as fatigue increased ($b = -0.38, p = .01$). However, for women with nonvisceral disease, there was not a significant association between fatigue and emotional function ($b = 0.03, p = .85$).

Discussion

This study is one of the few studies in the area of MBC and one of the very few to consider the role of body image and QoL in women for whom the goal of care is not cure. This study considered several psychosocial dimensions of QoL in the context of metastatic disease and found that body image was highly influential in the QoL of women diagnosed with MBC. Body image has been studied frequently in early-stage cancers where patients often have longer life expectancies. Findings from this study indicate that body image appears to remain influential even for those living with a shortened life expectancy.

Indeed, this study highlights how body image affects women's emotional and physical function and, in turn, their overall well-being. The middle-aged group (50–65) reported a significant increase in global QoL and physical function as body image increased. This association, while only in the middle-aged group, nevertheless signals an important relationship between how patients see their body and how they evaluate their strength and stamina. Given the important role that body image plays in women's lives regardless of illness, researchers should continue to develop and study additional dimensions of body image, including aspects of body shame and weight gain [23]. Researchers are also encouraged to develop measures of body image that attend to the unique conditions that women with MBC face, including how body image relates to fatigue and fears about death.

Other key psychosocial dimensions of QoL included disease site and fatigue. Women with nonvisceral disease reported increased emotional function as body image increased, while women with visceral disease reported decreased emotional function as fatigue increased. While

those patients with nonvisceral disease reported roughly the same emotional function regardless of their fatigue, those with visceral disease were significantly more affected by fatigue, signaling the important role that fatigue can play in QoL and how these effects vary by disease location. Questions of QoL often go unexamined in the face of end-of-life concerns, but these findings illustrate the importance of considering factors unique to metastatic disease (e.g., disease location) in understanding and improving women's QoL in their final days with MBC.

Like all research, the current study has limitations. The sample came from one cancer center in the USA, and as a result, these findings may not generalize to other cancer centers in the rest of the USA or world. In addition, the patients included in this sample were mostly white, educated women. These demographic characteristics may limit how these findings can be applied to women of color, as well as women living with less economic privilege. Future researchers are encouraged to consider additional clinical factors, such as treatment histories as well as the number of metastatic sites.

In conclusion, these findings highlight the role that disease characteristics and psychological factors play in women's QoL after diagnosis with MBC. Development of QoL support must consider patients' unique sets of body concerns—even those with short life expectancies. Medical providers can help support patients with MBC by addressing issues related to how women feel about their bodies and recognize that concerns about how one looks and feels remain central to patients, even near the end of life.

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Ethical standard All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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