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ORIGINAL PAPER

Breast Cancer Treatment Delays at an Urban Safety Net Hospital Among Women Experiencing Homelessness

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Abstract

Disparities in outcomes for vulnerable women is an ongoing problem. Homelessness and breast cancer treatment outcomes is understudied. This is a descriptive study exploring types of homelessness and treatment delays at an urban safety net hospital providing care to a vulnerable patient population.This study is a retrospective chart review of homeless female patients diagnosed with breast cancer between January 1, 2000 and December 31, 2014. Data for this study were acquired from the hospital cancer registry and electronic medical record. All demographic characteristics, time to treatment and factors related to delays to treatment were analyzed descriptively, reporting frequencies and proportions. The total number of individuals analyzed was 24. All except two subjects were delayed to treatment (≥ 30 days from diagnosis to treatment). Most women in this cohort were categorized as chronically homeless (46%) with the rest categorized as transitionally (29%) or episodically (12%) homeless. The majority of subjects (70%) were Black, non-Hispanic. All except one subject were publicly insured (71% Medicaid; 12% Medicare) or uninsured (8%). Regardless of type of homelessness, most subjects were either 30–60 or 60–90 days delayed. Those who were chronically homeless experienced significantly more delays to first treatment (56% of those who were delayed 30–60 days and 57% of those who were delayed 60–90 days; p value 0.006) than those who were episodically or transitionally homeless. Significant delays and barriers to breast cancer treatment exist among women experiencing homelessness. Further studies to improve breast cancer care for homeless women are warranted.

Keywords Homeless · Breast cancer · Treatment delay · Safety net hospital

Introduction

Breast cancer is the most common cancer among women and is the second leading cause of cancer deaths among women in the United States [1]. Though there have been significant improvements in treatment over time, not all women have benefitted equally. Disparities in breast cancer outcomes for vulnerable minority women has been a long-standing challenge and ongoing data suggest that the gap is widening [2]. Recent literature has shown that delays in treatment may contribute to increased breast cancer mortality among vulnerable populations [3, 4].

Disparities in breast cancer mortality are particularly prevalent in the homeless population. One study found that cancer was the second leading cause of death among homeless adults overall and the leading cause of death among those aged 45 and older [5]. Women experiencing homelessness are particularly affected by poor cancer outcomes compared to women who are housed, with a rate of death from breast cancer almost twofold in comparison [5].

Though cancer mortality in homeless women has been documented, there have been few studies examining the factors contributing to their poor outcomes from breast cancer. To our knowledge, there are no interventions specifically addressing homelessness, as a means of improving breast

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cancer outcomes, to date. This small-scale descriptive study aims to quantitatively assess length of delay and barriers to breast cancer treatment among women experiencing homelessness as it relates to type of homelessness and to qualitatively assess reasons for treatment delay.

Materials and Methods

This study is a small-scale descriptive analysis and retrospective chart review of homeless female patients diagnosed with breast cancer between January 1, 2000 and December 31, 2014 at Boston Medical Center (BMC) (n = 24). Data for this study were acquired from both the BMC cancer registry and from electronic medical record (EMR) review using Epic. The BMC clinical data warehouse provided housing status, demographic characteristics, and treatment information for each patient. A retrospective chart review was conducted to identify delays to breast cancer treatment and the potential reasons for delay between diagnosis and first treatment for those patients identified as homeless. This study was approved by the Boston University Institutional Review Board (IRB # H33680).

Eligibility Criteria

Inclusion criteria: Female breast cancer patients identified by the BMC clinical data warehouse who were categorized as homeless in Epic at the time of their cancer diagnosis.

Exclusion criteria: Patients who were diagnosed at BMC but did not receive treatment or received treatment at another institution; patients who were housed in public housing or nursing homes at the time of their diagnosis; patients who were not documented as homeless in Epic.

Definitions of Homelessness

Each individual in this analysis was categorized using the following type of homeless descriptors: transitionally, episodically or chronically homeless. Transitionally homeless individuals are those who experienced a life-altering event that caused them to seek emergency shelter for a short period of time (several weeks to months). Episodically homeless individuals have been homeless for less than 1 year and have experienced fewer than four episodes in the past three years. Chronically homeless individuals have been homeless for a year or more or have had four episodes in the past 3 years [6].

Data Analysis

All demographic characteristics, time to treatment and factors related to delays to treatment were analyzed descriptively, reporting frequencies and proportions. Delay to treatment was calculated as date of pathologically confirmed biopsy of breast cancer to date of first treatment (surgery or chemotherapy). Delay to first treatment has been traditionally and largely defined as > 90 days [7]. However, in recent years, there have been more studies that have looked at treatment delays > 30 days, suggesting that different types of breast cancer by stage and subtype, may benefit from first treatment within 30 days [3, 4]. As such, we report on three intervals, 30–60, 60–90 and > 90 day delays. Chi-squared tests for independence were used to assess differences between groups by length of delay. All quantitative analysis was carried out using SAS statistical analysis software version 9.3.

Results

Table 1 shows the demographic characteristics of homeless women in this analysis at the time of their breast cancer diagnosis. The total number of individuals analyzed was 24. All except two subjects were delayed to treatment (≥ 30 days from diagnosis to treatment). Most women in this cohort were categorized as chronically homeless (46%) with the rest categorized as transitionally (29%) or episodically (12%) homeless. The remaining women did not have a clear type of homelessness. All except one were over 40 years of age (41% 41–50; 25% 51–60; 29% 61–70). Ninety-one percent of subjects spoke English. The majority of subjects (70%) were Black, non-Hispanic. Most women identified as single (58%) or divorced (21%) at the time of breast cancer diagnosis. All except one subject were publicly insured (71% Medicaid; 12% Medicare) or uninsured (8%). Most women received surgery as their first treatment (92%) and had a relatively even distribution of stages at diagnosis (25% stage 0; 25% stage 1; 25% stage II; 17% stage III; 4% stage IV, 4% not reported). Half of subjects had a histology grade of III at the time of their diagnosis (50%).

Table 2 shows demographic characteristics by number of days delayed. Regardless of type of homelessness, most subjects were either 30–60 or 60–90 days delayed. Those who were chronically homeless experienced significantly more delays to first treatment (56% of those who were delayed 30–60 days and 57% of those who were delayed 60–90 days; p value 0.006) than those who were episodically or transitionally homeless.

Potential reasons for delay due to homelessness were collected via retrospective chart review and were analyzed qualitatively by theme. The results are presented in Table 3. Several themes arose from the data collected. The two individuals who were not delayed to treatment were documented as living with others at the time of diagnosis and moved into shelters post-treatment. A common theme among women

Table 1 Descriptive statistics of homeless population at an Urban Safety Net Cancer Hospital diagnosed with breast cancer between 2000 and 2014 (n = 24)

Characteristics	Homeless n (%)
Overall homelessness	
Episodic	3 (12.50%)
Transitional	7 (29.17%)
Chronic	11 (45.83%)
Unclear	3 (12.50%)
Age	
30–40	1 (4.17%)
41–50	10 (41.67%)
51–60	6 (25%)
61–70	7 (29.17%)
Language	
English	22 (91.67%)
Haitian Creole	2 (8.33%)
Race/ethnicity	
White	7 (29.17%)
Black	17 (70.83%)
Marital status	
Single	14 (58.33%)
Separated	1 (4.17%)
Married	2 (8.33%)
Divorced	5 (20.83%)
Widowed	1 (4.17%)
Unknown	1 (4.17%)
Insurance	
Private	1 (4.17%)
Uninsured	2 (8.33%)
Medicaid	17 (70.83%)
Medicare	3 (12.50%)
Other	1 (4.17%)
Year of diagnosis	
2001–2005	4 (16.67%)
2006–2010	8 (33.33%)
2011–2015	11 (45.83%)
Missing	1 (4.17%)
Number of comorbidities	
≤ 2	14 (58.33%)
3–6	7 (29.17%)
≥ 7	3 (12.50%)
First treatment	
Surgery	22 (91.67%)
Chemotherapy	1 (4.17%)
No treatment	1 (4.17%)
Stage at diagnosis	
0	6 (25%)
I	6 (25%)
II	6 (25%)
III	4 (16.67%)
IV	1 (4.17%)
Not reported	1 (4.17%)

who were delayed was that a majority became homeless directly after receiving their diagnosis or directly after their first treatment. Another common theme was that many of the women with the longest delays were also those who were the most transient (moving between shelters frequently) at the time of their diagnosis and treatment. A final theme was that several women missed appointments prior to diagnosis and treatment due to documented psychiatric issues or comorbidities.

Discussion

These results suggest that there are significant delays and barriers to breast cancer treatment among women experiencing homelessness. Despite literature supporting the positive impact of timely treatment on breast cancer outcomes and documented efforts to improve delays among vulnerable patients, homeless women remain a population for whom this is largely unmet. In this sample of 24 patients, all except two individuals were delayed to first treatment. The mean number of days to treatment was 98, which is markedly higher than the 21–60 days recommended for surgery and even higher than previously documented delays in other vulnerable populations [8, 9].

Our results point to a possible connection between type of homelessness at the time of diagnosis (chronic, transitional or episodic) and number of days delayed. The data suggest that those who are chronically homeless are more likely to have delays than those who are transitionally or episodically homeless. Literature has suggested that those who are chronically homeless interact with the healthcare system differently than those who are transitionally or episodically homeless, which could predict treatment delays [10, 11]. Further studies that categorize homelessness in this way are needed in order to best understand risk factors for delay, and to conceptualize interventions to mitigate treatment delays associated with various types of homelessness.

Our data suggest that reasons for delay to first treatment are greatly varied among homeless women. The majority of women experienced a change in their homelessness status after receiving their breast cancer diagnosis, typically to a more chronic homelessness situation. This rapid shift to chronic homelessness could suggest that patients were at risk for homelessness for some time prior to diagnosis and, therefore, more at risk for delays. Of the reasons for delay documented in the EMRs, the most common included lacking

Table 2 A descriptive comparison of delays to first treatment of homeless women with breast cancer (n = 22)

Characteristics	Number of days delayed			p value
	30–60 days n (%)	60–90 days n (%)	> 90 days n (%)	
Overall homelessness				0.006
Episodic	1 (11.11%)	1 (14.29%)	1 (25%)	
Transitional	3 (33.33%)	2 (28.57%)	1 (25%)	
Chronic	5 (55.56%)	4 (57.14%)	1 (25%)	
Age				0.72
30–40	0	1 (14.29%)	0	
41–50	3 (33.33%)	2 (28.57%)	2 (50%)	
51–60	3 (33.33%)	1 (14.29%)	2 (50%)	
61–70	3 (33.33%)	3 (42.86%)	2 (50%)	
Language				0.47
English	9 (100%)	6 (85.71%)	3 (75%)	
Haitian Creole	0	1 (14.29%)	1 (25%)	
Race/ethnicity				0.86
White	2 (22.22%)	2 (28.57%)	1 (25%)	
Black	7 (77.78%)	5 (71.43%)	3 (75%)	
Marital status				0.51
Single	5 (55.56%)	5 (71.43%)	2 (50%)	
Married	0	1 (14.29%)	1 (25%)	
Divorced	3 (33.33%)	1 (14.29%)	0	
Widowed	1 (11.11%)	0	0	
Unknown	0	0	1 (25%)	
Insurance				0.82
Private	1 (11.11%)	0	0	
Uninsured	1 (11.11%)	0	1 (25%)	
Medicaid	4 (44.44%)	6 (85.71%)	3 (75%)	
Medicare	2 (22.22%)	1 (14.29%)	0	
Not specified	0	0	0	
Year of diagnosis				0.28
2001–2005	2 (22.22%)	0	0	
2006–2010	2 (22.22%)	4 (57.14%)	1 (25%)	
2011–2015	5 (55.56%)	3 (42.86%)	2 (50%)	
Number of comorbidities				0.42
≤ 2	4 (44.44%)	3 (42.86%)	4 (100%)	
3–6	3 (33.33%)	3 (42.86%)	0	
≥ 7	2 (22.22%)	1 (14.29%)	0	
First treatment				
Surgery	9 (100%)	7 (100%)	3 (75%)	0.02
Chemotherapy	0	0	1 (25%)	
Stage				
0	2 (22.22%)	2 (28.57%)	1 (25%)	
I	3 (33.33%)	2 (28.57%)	1 (25%)	
II	3 (33.33%)	1 (14.29%)	1 (25%)	
III	1 (11.11%)	2 (28.57%)	1 (25%)	
IV	0	0	0	

Age: 2 missing (1 = 41–50; 1 = 61–70), Language: 2 missing (English); Race: 2 missing (Black), Insurance: 2 missing (Medicaid), Year or diagnosis: 1 missing year (delay < 60 days) 2 missing delays (1 = 2001–2005; 1 = 2011–2015), Comorbidities: 2 missing (< 2 comorbidities), First treatment: 2 missing (1 unknown treatment; 1 surgery), Stage: 1 missing stage (delay < 60 days); 2 missing delays (1 = stage 2; 1 = stage 4), Grade: 4 missing grades (3 delay < 60 days; 1 delay < 60 days), Homelessness status: 3 missing statuses (2 unclear; 1 delay < 60 days)

Table 3 Information on homelessness and delays to treatment gathered from EMR review from least days delayed to most days delayed

Study ID	Days to first treatment	Notes on delay
24	16	Lived at shelter with fiancé before diagnosis Discharged to recovery shelter after surgery
14	21	Lived with parents during treatment. Moved to shelter directly after treatment
1	32	Became homeless during treatment after losing job due to multiple comorbidities and surgeries
20	34	Did not show up to first surgery (no reason given) Walks from shelter to shelter on a daily basis
7	36	Missed several appointments for chemotherapy. Had a room in a shelter during diagnosis and surgery
13	37	Unable to work due to her illness and had financial concerns which lead to homelessness
12	39	Moving from shelter to shelter at time of diagnosis
5	43	Became homeless directly after receiving treatment
23	50	Became homeless after being admitted to a recovery shelter post-surgery
8	54	No notes in chart regarding reasons for homelessness
15	55	Lived in shelter at time of diagnosis and through treatment
16	62	Became homeless directly after diagnosis. Stayed in shelter after surgery. Haitian Creole speaking and used interpreter
11	64	Had previous cancer. Lived alone prior to surgery. Moved to shelter during treatment
6	71	Living in a shelter at diagnosis and struggled with substance abuse. Aware of tumor for months before feeling ready to address it
19	71	Stayed at multiple shelters during diagnosis and treatment
21	84	Staying at shelter during diagnosis and treatment
10	88	Renting an apartment at time of diagnosis and soon after moved to a shelter
18	88	Transferred care and became homeless upon moving to new location
17	118	In the process of becoming homeless during treatment
22	189	No beds available at a recovery shelter. Several psychiatric issues delayed chemotherapy
4	229	Missed several appointments prior to diagnosis while living in shelter
9	681	Compliance issues, missed several appointments and was a poor candidate for chemotherapy due to comorbidities

2 patients did not have information about information about their homelessness in their chart or preferred not to disclose any information regarding their homelessness to their physicians

a recovery shelter post-surgery, psychiatric illnesses influencing decision making capabilities, multiple comorbidities (including substance use) that interfered with treatment, and financial concerns due to medical expenses. Though some of these reasons for delay have been documented in recent literature, little has focused on the unique situations of homeless women. While personal accounts of the destabilizing effects associated with a breast cancer diagnosis in the vulnerable BMC population, including homelessness are documented in the media, qualitative research in this area is scant [12]. Future qualitative research could help to better define reasons for delay to treatment and to generate innovative solutions to improve delivery of cancer treatment, with subsequent improvement in outcomes, for these women.

This study has a number of limitations. First, the women presented in this analysis are not representative all of those who were homeless between the years of 2000 and 2015. We were unable to capture all patients who met our definition of homelessness by looking at clinical data. These data were acquired from a data warehouse query of the EMR which only identified homelessness if it was documented in the medical record. Our query lead to small numbers for analysis. Furthermore, the categorizations of homelessness intensity are merely an estimate as not all housing status or change in housing status is documented in EMRs. In addition, the reasons for delay were inferred from retrospective chart review and not through data collection directly from the patients or providers. However, despite several limitations, these data point to a critical need for further research and intervention.

Conclusions

Overall, the results from this analysis suggest that homeless women experience longer delays to treatment than other populations. These delays could contribute to poor cancer outcomes among women experiencing homelessness. This small-scale, descriptive study offers a preliminary set of data and points to a critical need for further studies. Further research is necessary in order to inform interventions tailored to the unique situations of homeless and vulnerable women with breast cancer.

Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

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