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THE EFFECT OF LANGUAGE BARRIERS ON VARIATION AND RECEIPT OF EARLY STAGE BREAST CANCER TREATMENT

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THE EFFECT OF LANGUAGE BARRIERS ON VARIATION AND RECEIPT OF EARLY STAGE BREAST CANCER TREATMENT

Abstract

Background: Arriving at and implementing an appropriate patient centered treatment plan for early stage breast cancer requires significant dialogue between healthcare providers and patients. How language barriers affect this process has not been thoroughly explored in the literature. The aim of this paper is to examine the effect of language barrier on variation and receipt of early stage breast cancer treatment.

Methods: Rates of lumpectomy, mastectomy, and contralateral prophylactic mastectomy (CPM) with or without reconstruction were compared between English speaking and Low English Proficiency (LEP) cohorts. Patients with recurrent or bilateral breast cancer, male patients, and/or known genetic mutations were excluded. Receipt of recommended treatments including chemotherapy, hormonal therapy and radiation were compared between the two groups, as well as patient refusal and loss of follow-up. Regression analysis for all-cause mortality within this time period was tabulated for each group.

Results: There were no significant differences between receipt of recommended treatments, patient refusal or loss of follow up between the cohorts. LEP patients had a greater proportion of lumpectomies (79.7 versus 70.7%) while 9.2% of English-speaking patients had CPM or CPM with reconstruction compared to none of the LEP patients. These trends, however, did not rise to statistical significance within our small population sample. Age, insurance type, and LEP were associated with significant difference in all-cause mortality, however only age and insurance remained significant in adjusted analysis.

Conclusion: Our results indicate a non-statistically significant trend towards less variation of surgical treatment variation for early stage breast cancer in the LEP population, including a greater frequency of lumpectomy and less utilization of CPM. Larger, multicenter studies would be needed to affirm and further investigate these trends.

Keywords

breast cancer, early stage breast cancer, surgery, language barrier, immigrant, health care, breast conserving therapy, prophylactic mastectomy, disparities

Cover Page Footnote

The Effect of Language Barriers on Variation and Receipt of Early State Breast Cancer Treatment: A Single Center Study at a Midwestern, Metropolitan, Safety Net Hospital

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ABSTRACT

Background: Arriving at and implementing an appropriate patient centered treatment plan for early stage breast cancer requires significant dialogue between healthcare providers and patients. How language barriers affect this process has not been thoroughly explored in the literature. The aim of this paper is to examine the effect of language barrier on variation and receipt of early stage breast cancer treatment.

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Keywords: Breast cancer; disparities; low English proficiency; underserved

INTRODUCTION

The surgical treatment of early stage breast cancer is, in part, determined by a patient's health literacy and understanding of treatment options. Loco-regional breast cancer treatment, compared to other cancer treatments, is particularly dependent on communication between surgeon and patient and, therefore, particularly dependent on a shared language. The surgical treatment of early stage breast cancer can be done through a variety of techniques including lumpectomy with radiation, mastectomy, or contralateral prophylactic mastectomy (CPM) with or without reconstruction. The surgical treatment a woman receives depends on various factors including: National Comprehensive Cancer Network (NCCN) guidelines, surgeon bias, need for symmetry with regards to breast anatomy, perception of radiation therapy, and their level of anxiety around their diagnosis and possible recurrence (Gu et al., 2018; Halpern et al., 2015; Warner et al., 2015). In some sense, the surgical plan is negotiated between the surgeon and the breast cancer patient (Halpern et al., 2015). This plan is not only based on rational treatment guidelines, but also on subtle realities affecting the patient that could be difficult for even the most articulate patient to express in their native language.

In 2011, a study published in the Journal of Cancer Education examined the quality of life of Latina breast cancer survivors in the US. The study detailed the poignant and critical effects of language barriers on an immigrant patient's experience. Quotations from their interviews include the following statements: "Sometimes they put you with an interpreter, but I understand a little bit, and the interpreter does not say what you are saying." "...I bless the doctor, but the truth is that I do not know why he made another surgery there." (Lopez-Class et al., 2011).

Delivering adequate health care to the immigrant population is a unique challenge. Cultural barriers, lack of insurance coverage, and the legal ramifications of immigration status lead to health care disparities in this population (Cheung et al., 2017; Karliner, Kim, Meltzer, & Auerbach, 2010; Karliner, Ma, Hofmann, & Kerlikowske, 2012; Naghavi et al., 2016). There is evidence that patients with low English proficiency have higher hospital readmission rates, higher local recurrence rates with certain cancers, are less likely to see cancer specialists, and are less likely to perceive that their health care providers are addressing their individual needs (Karliner et al., 2010; Qureshi et al., 2014; Rosales, Ashing, & Napoles, 2014). Understanding the variables that affect health care delivery in the immigrant population becomes even more critical as the debate over allotment of government resources continues to impact health care delivery to this population. Our institution is a public safety net hospital and accredited cancer center that serves a diverse population with several large immigrant cohorts. Our interpretive services department is one of the largest in the country with 21 different languages represented by on-site staff and over 40 languages available with the addition of off-site video interpreters. Even with the robust cultural and language services offered, whether this makes up for the complex communications required to deliver breast cancer care within these Low English Proficiency (LEP) communities is unknown. The aim of this study is to describe the influence of language on breast cancer care, specifically variation in surgical treatment choice, receipt of recommended treatments, and continuity of care.

METHODS

   Upon institutional review board (IRB) for human subjects research approval, we obtained data from our prospectively maintained database within our accredited comprehensive cancer center. Chart evaluation was used to verify the surgical treatments as the index surgical operation for the patient's initial breast cancer diagnosis. Patients with early stage breast cancer during the years of 2008 to 2018 were included in this study. Additional inclusion criteria were female sex and early stage breast cancer defined as stages 0, 1A, 1B, 2A, and 2B. Male patients and patient with recurrent, bilateral breast cancer, and/or with known BRCA 1 or BRCA 2 mutations were excluded from the analysis.

   Descriptive statistics included: Geographic area of origin, race, sex, age, first language, second language, interpreter requirement [Low English Proficiency (LEP)], breast cancer AJCC stage, tumor site, age at diagnosis, and mortality status. Surgical treatment data included surgical options of lumpectomy, mastectomy, contralateral prophylactic mastectomy, mastectomy with reconstruction or contralateral prophylactic mastectomy with reconstruction. Data on receipt of recommended radiation therapy, hormone therapy, or chemotherapy was also gathered. For patients who had incomplete treatment, specification of reason was given as either loss of follow-up or patient refusal.

   Data were analyzed using Stata 15.2 (StataCorp, College Station, TX). Descriptive statistics, Student's T-test and Fisher's Exact test were used to analyze demographics, stage, insurance status, treatment modalities, and outcomes. Univariable and multivariable logistic regression analysis assessed mortality status. A P value of <0.20 was set to be included on multivariable analysis. Statistical significance was set at P ≤ 0.05.

RESULTS

   Between 2008 and 2018, 417 patients met criteria for inclusion in this study. The ratio of English speaking to LEP patients was 6:1. The majority of LEP patients were Spanish speaking from North, Central, and South American Countries (Figure 1). LEP patients presented at a younger age, 53.9 versus 58.4 years compared to English speaking patients (P=0.017). There was a significant difference in race between the two groups (P=0.003). LEP patients were more likely to be categorized as white, while there was a higher proportion of black patients in the English-speaking cohort (Table 1). There was no significant difference between stage at presentation between the two groups (Table 1).

Figure 1. Countries of origin in LEP patient cohort.
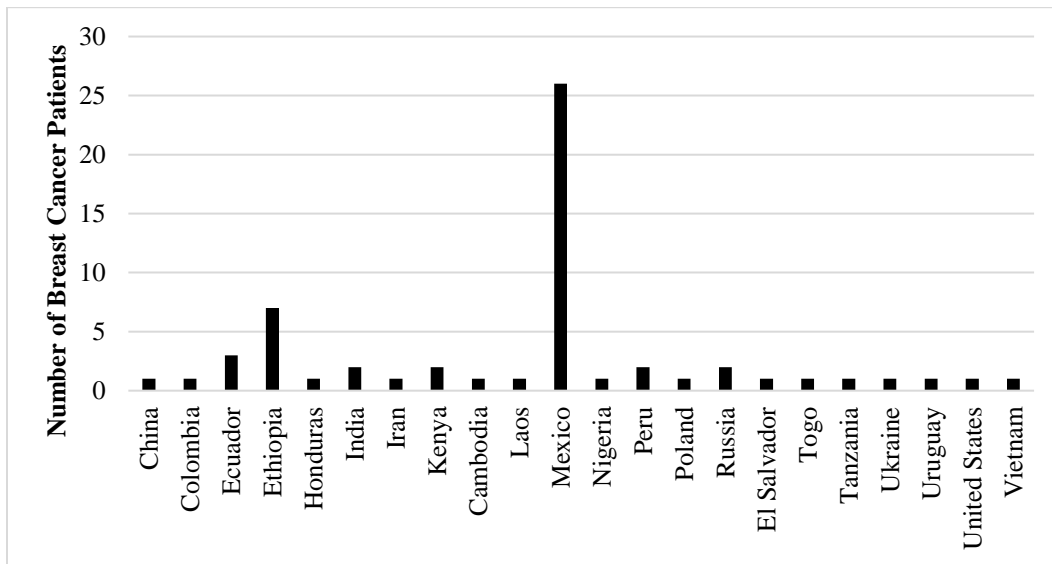
Differences in surgical treatments between the two groups did not reach statistical significance, but no women in the LEP cohort received a contralateral prophylactic mastectomy, with or without reconstruction, whereas 9.2% of women in the English-speaking group received CPM with or without reconstruction (Table 1). A higher proportion of LEP patients received lumpectomy (79.7% versus 70.7%) (Table 1). Significantly more LEP patients were insured through Medicaid (39.0% versus 15.1%) or were uninsured (18.6% versus 6.2%) compared to the English-speaking patients (P<0.001). While not statistically significant, a larger proportion of LEP patients received recommended chemotherapy, radiation, and/or hormone therapy than English speakers (Table 1). Interestingly, there was a trend towards more English speakers refusing recommended chemotherapy, radiation, or hormone therapy (Table 1). There was no significant difference between the two groups with respect to incomplete treatment and loss of follow-up (Table 1). There was a significant difference in overall mortality between the two groups with 96.6% of the LEP patients being alive at the end of the time period and 86.9% of the English-speaking population being alive at the end of the same time period (P=0.029).

Table 1. Demographics, treatment, and outcomes

	Cohort N=417	English N=358	LEP N=59	P value[a]
Age y, mean (SD)	57.8 (13.3)	58.4 (12.9)	53.9 (15.0)	**0.017**
Race, N (%)				**0.003**
White	252 (60.4)	211 (58.9)	41 (69.5)	
Black	143 (34.3)	132 (36.9)	11 (18.6)	
Other	22 (5.3)	15 (4.2)	7 (11.9)	
AJCC stage, N (%)				0.221
0	60 (14.4)	52 (14.5)	8 (13.6)	
1	38 (9.1)	37 (10.3)	1 (1.7)	
1A	143 (34.3)	123 (34.4)	20 (33.9)	
1B	13 (3.1)	12 (3.4)	1 (1.7)	
2A	107 (25.7)	88 (24.6)	19 (32.2)	
2B	56 (13.4)	46 (12.9)	10 (17.0)	
Surgery, N (%)				0.161
Lumpectomy	300 (71.9)	253 (70.7)	47 (79.7)	
Mastectomy	76 (18.2)	65 (18.2)	11 (18.6)	
CPM	24 (5.8)	24 (6.7)	0 (0)	
Mastectomy with reconstruction	8 (1.9)	7 (2.0)	1 (1.7)	
CPM with reconstruction	9 (2.2)	9 (2.5)	0 (0)	
Reconstruction, N (%)	17 (4.1)	16 (4.5)	1 (1.7)	0.487
Insurance, N (%)				**<0.001**
Commercial	198 (47.5)	177 (49.4)	21 (35.6)	
Medicare	109 (26.1)	105 (29.3)	4 (6.8)	
Medicaid	77 (18.5)	54 (15.1)	23 (39.0)	
Uninsured/unknown	33 (7.9)	22 (6.2)	11 (18.6)	
Chemotherapy, N (%)				0.145
Not recommended	225 (55.7)	201 (57.4)	24 (44.4)	
Received	137 (33.9)	111 (31.7)	26 (48.2)	

Refused	39 (9.7)	35 (10.0)	4 (7.4)	
Recommended, unknown if given	3 (0.7)	3 (0.9)	0 (0)	
Radiation, N (%)				0.256
Not recommended	152 (36.6)	136 (38.1)	16 (27.6)	
Received	227 (54.7)	188 (52.7)	39 (67.2)	
Refused	24 (5.8)	22 (6.2)	2 (3.5)	
Recommended, unknown if given	12 (2.9)	11 (3.1)	1 (1.7)	
Hormone therapy, N (%)				0.575
Not recommended	135 (33.3)	119 (34.0)	16 (28.6)	
Received	228 (56.2)	193 (55.1)	35 (62.5)	
Refused	33 (8.1)	30 (8.6)	3 (5.4)	
Recommended, unknown if given	10 (2.5)	8 (2.3)	2 (3.6)	
Incomplete treatment, N (%)	87 (20.9)	76 (21.2)	11 (18.6)	0.732
Lost to follow-up, N (%)	18 (4.3)	15 (4.2)	3 (5.1)	0.729
Patient alive, N (%)	367 (88.2)	311 (86.9)	56 (96.6)	**0.029**

[a]Student's T-test for continuous variables and Fisher exact test for categorical variables

We examined factors associated with mortality and failure to complete recommended treatment or being lost to follow-up. Only age and Medicare insurance were associated with failure to complete treatment or being lost to follow-up. Age and Medicare insurance were associated with increased risk of death (Table 2). LEP patients were at lower risk of mortality (OR 0.24, P=0.050). However, when adjusting for age and insurance type, language was no longer significant (Table 2).

Table 2 Factors associated with mortality

		OR (CI)	P value[a]	OR (CI)	P value[b]
Age		1.05 (1.03,1.08)	<0.001	1.04 (1.01,1.07)	**0.003**
Race					
	White	Ref			
	Black	1.30 (0.70, 2.39)	0.410		-
	Other	0.38 (0.05,2.93)	0.353		-
Stage					
	0	Ref			
	1	0.87 (0.33,2.31)	0.779		-
	2	1.71 (0.67,4.38)	0.265		-
Insurance					
	Commercial	Ref			
	Medicare	4.74 (2.33,9.66)	<0.001	3.41 (1.63,7.14)	**0.001**
	Medicaid	1.65 (0.66,4.15)	0.288	2.63 (0.99,7.00)	0.053
	Uninsured/unknown	0.44 (0.06,3.52)	0.443	0.78 (0.10,6.37)	0.815
Language					
	English	Ref			
	LEP	0.24 (0.06,1.00)	0.050	0.29 (0.06,1.33)	0.112

[a]Univariable logistic regression
[b]Multivariable logistic regression

DISCUSSION

In our sample of early stage breast cancer patients, 14% of patients were LEP patients who required language services. This number mirrors statistics from the US Census Bureau released in 2017 estimating that 13.4% of the US population was foreign born ("United States Census," 2018). The aim of this paper was to quantify the effect of low English proficiency (LEP) on early stage breast cancer surgical treatment choice, receipt of recommended treatment and continuity of care at our comprehensive cancer center. Receipt of NCCN guidelines recommended treatment and continuity of care was equivalent between the two groups. There was a trend towards a greater number of lumpectomies in the LEP group, but this trend did not rise to statistical significance. Interestingly, no women in the LEP cohort received a contralateral prophylactic mastectomy, with

or without reconstruction, whereas 9.2% of women in the English-speaking group received CPM with or without reconstruction. Overall mortality was significantly lower for the LEP cohort, however the effect that was lost when adjusted for age and insurance status.

In unadjusted analysis, overall survival was significantly higher in the LEP group of early stage breast cancer patients at our institution with an absolute difference of 9.7% (P=0.029). In our study population, all LEP patients apart from a single ASL patient were foreign born. There is a documented survival advantage to immigrant populations in North America called the "immigrant paradox" (Cheung et al., 2017; Singh & Hiatt, 2006). Much of this survival difference has been attributed to positive immigrant selection, lifestyle differences, and better social support systems seen in immigrant populations. In our study, LEP status was no longer a significant factor in this mortality difference when adjusted for age and insurance status. LEP patients presented at diagnosis approximately five years younger (53.9 years versus 58.4 years, P=0.017) than their English-speaking counterparts. Reasons for this age difference at presentation are not clear but may be influenced by genetics and be skewed by the relatively large proportion of Hispanic women in our cohort. A recent study by Stapleton et al using data from Surveillance, Epidemiology, and End Results Program (SEER) from the National Cancer Institute confirms that 34.9% of Hispanic women diagnosed with breast cancer are younger than 50 years old (Stapleton, Oseni, Bababekov, Hung, & Chang, 2018). This is compared to 32.8%, 31%, and 23.6% for Asian, Black, and White women, respectively (Stapleton et al., 2018). Neither race nor stage at diagnosis was associated with mortality in our study. However, insurance status (Medicare specifically) was a significant predictor of mortality. Medicaid insurance or uninsured status was not a significant predictor of mortality. Due to the small sample size, we are unable to infer any confounding socioeconomic factors that may influence outcomes of early stage breast cancer.

In our cohort, LEP patients showed a continuity of care equivalent to their English-speaking counterparts. We found no significant difference in patient refusal of recommended treatments or loss of follow-up between the two populations. This suggests an equivalent capacity for healthcare compliance despite language barriers in our cohort of patients. In our study, there was a non-significant trend towards greater compliance towards NCCN recommended treatments in LEP patients. Our rates of follow-up compare favorably to other published data showing that up to half of LEP patients have incomplete assessments (Karliner et al., 2012; López et al., 2013). Lopez et al completed a survey study of 742 California women demonstrating inadequate follow-up for DCIS patients that were primarily Spanish speaking (López et al., 2013). Karliner et al demonstrated that LEP status was a factor in late follow-up (> 30 days) for abnormal mammogram (Karliner et al., 2012).

It is difficult to draw comparisons between hospitals with respect to cancer care for LEP populations that require interpreter services. Language services are required in all US healthcare institutions under the Civil Rights Act of 1964 ("Title VI of the Civil Rights Act of 1964; Policy Guidance on the Prohibition Against National Origin Discrimination As It Affects Persons With Limited English Proficiency," 1964), however the cost of this depends on whether or not the home state applies for federal reimbursement under the CHIP Reauthorization Act of 2009 ("CHIPRA," 2009). If a state chooses to do so, it is subsequently held to higher standards of language services as set forth by Section 1557 of the Affordable Care Act ("Section 1557 of the Patient Protection and Affordable Care Act," 2016). These standards require proficiency testing for interpreters and

availability of a qualified interpreter for all patient interactions. As of 2017, Minnesota is one of fifteen states that offers some level of reimbursement to providers for language services (62A.25, 2018). As a result, the standardization and quality of language services may be higher than in other states.

Despite the development of standardized language services at our institution, there are still notable differences in treatment variation that persist in our LEP population that parallel other studies (Campesino et al., 2012; Soon et al., 2019). 9.2% of English-speaking patients at average risk for breast cancer recurrence received CPM or CPM with reconstruction for early stage breast cancer, while no average risk LEP patient received CPM or CPM with reconstruction in our patient cohort. A recent Australian study by Soon et al demonstrated Non-English-speaking breast cancer patients to have lower rates of breast reconstruction. In this this same study, all women surveyed identified the need for more education about reconstruction and that additional education would likely influence their decision for surgical treatment (Soon et al., 2019). Campesino et al interviewed 39 breast cancer patients in the United States and compared the surgical choices of African American and Latina women. The Non-English speaking Latina women were noted to have relied heavily on surgeon recommendation and the majority of these patients had breast conserving therapy (Campesino et al., 2012).

When a patient's tumor, anatomy, and clinical history are amenable, breast conserving therapy is the standard of care for early stage breast cancer in the United States. The consensus statement on Contralateral Prophylactic Mastectomy from the American Society of Breast Surgeons clearly states breast conserving therapy should be recommended to all patients who are appropriate candidates (Boughey et al., 2016). However, rates of CPM for early stage breast cancer in women of average risk have increased significantly over the last two decades. Between 2004 and 2012, the national rates increased from 3.6% to 10.5% for all age groups (Nash et al., 2017). This varies from state to state with rates reaching 42% between 2010-2012 in the contiguous Midwestern states of Nebraska, Colorado, Iowa, Missouri and South Dakota (Nash et al., 2017). Regardless of the controversy, CPM has become a treatment choice for average risk, early stage breast cancer patients and may contribute to the quality of life of certain breast cancer survivors. Our study shows a combined rate of CPM and CPM with reconstruction for early stage breast cancer in average risk patients is 7.9%, which is lower than the national average. This lower than average rate may be associated with surgeon bias in favor of partial mastectomy for early stage breast cancer at our center. When language barriers are superimposed on a complex decision-making process between a physician and patient, the authority and weight of surgeon recommendation may be more pronounced. Our study suggests low English proficiency may constrict the range of surgical treatment choices towards the standard breast conserving therapy for early stage breast cancer. However, attributing causality to LEP status with respect to surgical treatment choice is outside the scope of this study. Other factors, such as cultural influences, may direct decision-making and further study is needed to address these potentially confounding factors.

There is some evidence that higher patient socioeconomic status is a factor associated with CPM in the treatment of early stage breast cancer (Jerome-D'Emilia, Kushary, & Suplee, 2019). The difference between receipt of BCT and CPM in English speakers and LEP patients at our institution can not necessarily be attributed to socioeconomic or financial factors influencing

availability of treatments. In the state of Minnesota, all public assistance and private insurance plans are required to cover breast reconstruction, without regard to risk status. This covers reconstruction of the affected breast and the unaffected breast for the purpose of restoring symmetry (62A.25, 2018).

Weaknesses of our study include typical factors associated with single center, small sample size studies, and bias associated with reliance on an institutional database for initial identification of potential study participants. We had a relatively low volume of early stage breast cancer patients over the ten-year period examined and our LEP patient population was small after exclusion criteria were applied. This lack of power may have precluded finding significant differences between the two cohorts that do exist. Our data relies on our center's local database, which collects discrete information in a routine fashion. This does not reflect the complex context in which each patient's breast cancer treatment takes place. Our pilot study is a convenience sample and was kept intentionally simple in order to remain quantitative, but this simplicity will inevitably leave out pertinent details that affect treatment choice, continuity of care, and survival.

Further study could be undertaken to evaluate breast cancer treatment of LEP patients comparing states which reimburse hospitals for language services and those that do not. This could give insight into how large of an effect this reimbursement has on the adequacy of language services in the healthcare setting. Using data from multiple institutions could elucidate whether or not the trend towards BCT among LEP patients becomes significant when analyzed in a larger study population. If so, the idea that this represents a constriction of choice due to lack of information and understanding of options could be explored using language specific decision-making aids. Breast cancer decision-making aids offer a relatively simple educational outreach that have the potential to positively impact a breast cancer patient's treatment process and subsequent quality of life (Hawley, Newman, Griggs, Kosir, & Katz, 2016).

CONCLUSION

In summary, our single center study demonstrates the requirement of a translator does not lead to decreased continuity of care, refusal of recommended treatment, or increase in mortality in an institution with standardized and universal language services. There is a trend towards less variation of surgical treatment in LEP patients - a greater proportion of lumpectomies, less reconstruction, and no contralateral prophylactic mastectomies among average risk women. It will become increasingly important to address issues of immigrant health care in a systematic way as they impact specific institutions disproportionally. The effort to understand what factors influence health care outcomes amongst the foreign-born has the potential to enlighten and direct the national political dialogue and our resource utilization in an effective manner that considers and protects vulnerable populations.

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