Predictors of mammography use in older women with disability: the patients' perspectives

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Abstract

To determine the factors associated with mammography use among Medicare beneficiaries and reasons for nonuse. Cohort of 4610 community-dwelling Medicare beneficiaries 65 years included in the 2004–2005 Medicare Current Beneficiary Survey. Regression models evaluated the association of disability with mammography use. Reasons for underuse are described. Women with disability were more likely than women with no disability to report lower mammography use (unadjusted, moderate disability OR = 0.76; 95% CI = 0.64, 0.91; severe disability OR = 0.46; 95% CI = 0.40, 0.54). Lower use was significant for women with severe disability (adjusted, OR = 0.67; 95% CI = 0.54, 0.83) and women with fair-poor self-rated health, no HMO enrollment and 3 comorbidities. No physician recommendation, no need, dislike/pain during the test and forget it were reasons for underutilization. Mammography use decreases with increasing level of disability. Common reasons for underutilization are no physician recommendation, no need, dislike/pain during the test and forgot it. Screening guidelines should be used to target women with disabilities who can benefit from mammography.

Keywords

Disability; Mammography; MCBS; Cohort

Introduction

The U.S. Surgeon General recommends eliminating health disparities for people with disabilities with the goal of improving their quality of life and preserving their independence [1]. The longer life expectancy in this population compared to previous decades further underscores their need for access to curative and preventive care [2]. In particular, disabled women are less likely to undergo recommended preventive services such as screening mammography [3–5]. Risk factors for their underuse of preventive services include mobility impairment and intellectual disability [3–5]. Research prior to 1997 found that female Medicare beneficiaries with more disability were less likely to receive mammography [3, 6]. Mammography rates then increased between 1998 and 2000 for all women, including women with disability. This increase may be explained by the passage of the Balanced Budget Act of 1997, when Medicare began covering screening mammography [7].

Concerns persist, however, about the lower likelihood of receiving mammograms among women with disabilities [3–5]. Reasons for lower mammography use include inability to physically position for the test, no physician recommendation, or a woman's misperception of low breast cancer risk [8]. Based on our prior research, disparities in screening rates among women with disabilities may contribute to larger tumors at breast cancer diagnosis [9]. The respective roles of health status, insurance type, comorbidity and level of disability in the receipt of screening mammography are unclear.

In this study, we sought to determine how socio-demographic characteristics, health status and access to care impact mammography use for women with mild, moderate and severe disability. Such knowledge can identify potential areas for interventions to improve breast cancer screening in older women living with disabilities. Data were obtained through population-based surveys in 2004–2005 of community-dwelling Medicare beneficiaries. Of interest was identifying factors associated with mammography use and the reasons for nonuse among older women with disabilities.

Methods

Data and study sample

This is a study of female Medicare beneficiaries who responded to the Medicare Current Beneficiary Survey (MCBS). MCBS is a continuous, multipurpose survey representative of the Medicare population. It collects detailed information on health status, cost and use of services, social and demographic characteristics and insurance type [10]. The survey covers both community-dwelling beneficiaries as well as those residing in institutions. However, this study used only data from the community survey. Participants are interviewed for 1 h every 4 months for 4 years. The interview is in person or by telephone, utilizing computer-assisted personal interview (CAPI) software. About 15% of participants need a proxy during the interview. MCBS combines personal interviews with Medicare administrative and claims data, with individual identifiers removed by the Centers for Medicare and Medicaid Services (CMS).

From the Access to Care Files, we initially selected a 2-year longitudinal cohort (2004–2005) of women who completed the community survey (n = 5,963). Women were excluded if they were less than 65 years, resided in a long-term care facility, had end-stage renal disease or had incomplete data (1,353 exclusions). This resulted in a sample of 4,610 women, of which 1,640 (35%) did not report having a mammogram in either 2004 or 2005. The study used the interview content of MCBS to assess physical functioning and disability since Medicare claims do not report activities of daily living (ADL) [11, 12]. The study was approved by the Institutional Review Board of the University of Texas Medical Branch.

Predictor variable

Disability was the primary predictor variable. The definition of disability was that used by Femia [13, 14] and followed the conceptual model of Verbrugge and Jette [15] in which the main pathway is pathology resulting in impairment. Femia described the geriatric disablement process by taking into account not only physical and functional limitations but also psychological and social functioning. The ultimate result is a definition of disability based on functional limitations of ADL and instrumental activities of daily living (IADL) [16, 17]. ADL was assessed by the question, "Because of your health or physical problem do you have any difficulty with: bathing/showering; dressing; eating; getting in and out of bed/ chairs; walking; using the toilet?" IADL was assessed by the question, "Because of your health or physical problem, do you have any difficulty with the following: using the phone; doing light housework; doing heavy housework; preparing own meals; shopping for personal items; managing money?"

Disability was an ordinal variable, scored in three levels, from 0 to 2, with 0 indicating no ADL or IADL limitations; 1 indicating any IADL or mobility ADL (walking) limitation; and 2 indicating any basic ADL limitation (bathing/ showering; dressing; eating; getting in and out of bed/ chairs; using the toilet). Femia further categorized this variable by level of severity: 0 for no disability, 1 for moderate disability and 2 for severe disability [13].

Assessment of mammography use

Mammography use was the outcome variable, based on the question, "Have you had a mammogram or a breast X-ray since a year ago?" The four possible responses were yes, no, refused, or do not know. Women responding "do not know" or "refused" were excluded from analysis as missing data (N = 74). The excluded group had a higher level of disability (33.5% no disability, 23.8% moderate disability and 42.7% severe disability) than those included in the sample (53.5% no disability, 27.5% moderate disability and 19.0% severe disability) (P < 0.001). Also, women with proxy respondents (N = 396) had a greater level of disability (11.8% none, 31.1% moderate and 57.1% severe disability) than those who self-responded (56.5% none, 27.2% moderate and 16.3% severe disability) (P < 0.001).

Among women who did not report receiving mammography, a second outcome variable was self-reported reasons based on 14 close-ended responses to the question: "What is the reason you have not had a mammogram since a year ago?" More than one choice was allowed (doctor did not recommend it, too ill, cost of test/insurance does not cover, not worth the money/no need, test useless, not recommended every year, doctor recommend against

getting it, not at risk, do not like mammogram/pain, had a mastectomy, inconvenient/ transportation, forgot/missed it, afraid of results, never heard of it).

We followed the recommendations for mammography from the United States Preventive Services Task Force (USPSTF)—mammogram every 1–2 years—since women in the study were older than 65 [18]. We also established a 70% target rate for mammography based on the recommendations of Healthy People 2010 [19].

Covariates

Social and demographic characteristics included age (continuous), marital status (married or not), median household income of the zip code of residence (>$25,000 or ≤$25,000) and education (<12 years or ≥12 years). Other covariates from data in the questionnaire included: SSDI status (yes/no), self-rated health (excellent/very good/good vs. fair/poor) and number of comorbidities (1, 2, or ≥3) including cancer, diabetes mellitus, acute myocardial infarction, coronary heart disease, stroke, rheumatoid arthritis, emphysema and complete or partial paralysis. Cognitive deficit was defined by responses to questions about memory loss, problems making decisions, or trouble concentrating (yes/no). Depression was ascertained by the question: "In the past 12 months, how much time did you feel sad, blue or depressed?" The answer was dichotomized (yes/no) by grouping "all of the time" and "most of the time" as depressed versus "some of the time", "a little of the time" and "none of the time" as not depressed.

Statistical analysis

Descriptive statistics were used to describe the study population of older women stratified by three levels of disability: 0, 1 and 2. Three logistic regression models were constructed to evaluate (1) the unadjusted association of disability with mammography use, (2) the association of disability with mammography, adjusted for demographic characteristics and insurance type (HMO enrollment vs. fee for service) and (3) the association of disability with mammography, adjusted for demographic characteristics, HMO enrollment and health-related factors. The proportion (standard error) of the reasons for not having mammography were calculated, stratified by level of disability (none, moderate or severe) and age (65–74 and 75+ years). All computations were adjusted for the 2-year longitudinal sampling weights for the 2004–2005 cohort. All analyses were performed using SAS survey procedures (SAS Inc., Cary, NC) to account for sampling design and weighting of MCBS. A P-value <0.05 was considered statistically significant.

Results

Study population

In the 2004–2005 cohort, about half of the 4,610 women in the MCBS had no disability, 1,325 (29 %) had moderate disability, and 956 (21 %) had severe disability (Table 1). With the use of sampling weights, the estimated number of Medicare women aged 65+ years in the United States with moderate disability was 4.6 million and with severe disability, 3.2 million. Those with disability were older, had a higher proportion of blacks and Hispanics, were more likely to be unmarried, and had lower levels of income and education than

women with no disability. The group with severe disability also had a higher proportion of women entitled to Medicare benefits for disability (SSDI), more comorbidities and a higher proportion reporting fair/poor self-rated health compared to women without disability. They were also more likely to report cognitive deficits and depression.

Multivariate models of mammography use

We developed three models to identify factors associated with mammography use for women with disabilities. The unadjusted Model 1 shows that compared to women with no disability, women with moderate disability had 24% lower odds of receiving mammography, and women with severe disability had 54% lower odds (Table 2). Model 2, adjusted for demographic factors and enrollment in an HMO, shows a 35% lower odds of mammography use in women with severe disability than in other women. Adjusting for HMO enrollment and patients' demographics led to normal mammography utilization among women with moderate and no disability. Model 3 further adjusted for self-rated health, comorbidity, cognitive deficit, and depression. The results show that the added covariates in Model 3 did not account for the discrepancy in use. Contrary to expectations, having >3 comorbidities increased the odds of mammography use (OR = 1.56; 95% CI = 1.13, 2.10), regardless of level of disability. Even though cognitive deficits and depression were common among women with disability, neither cognitive deficit (OR = 0.93; 95% CI = 0.75, 1.15) nor depression (OR = 0.99; 95% CI = 0.75, 1.34) were associated with mammography use. Lower zip code income was associated with significantly lower odds of mammography use after adjusting for factors in the model (Model 3: OR = 0.67; 95% CI = 0.56, 0.80). No significant interaction of any covariates was found with disability status.

Multiple reasons for not having mammography

Only women who did not have mammography were asked the reason for not having the test. Reasons reported are shown in Table 3, stratified by age and level of disability. Reasons most often cited for low utilization were no need for the test, no doctor recommendation, forgetting the test, disliking it and finding it painful. In addition, other reasons such as transportation problems, it was not worth the money or cost hindered its use were mentioned but these were infrequent.

Discussion

Our data indicate that women with disability were less likely to receive mammograms. The difference was no longer significant after adjusting for patient characteristics (demographic factors and HMO membership). Lack of physician recommendation, no need for the test, forgetting the appointment, disliking the test and finding the test painful were the most common reasons reported for not receiving them.

Our data describe an older population whose increasing level of disability place women at risk for lower mammography use. Having more than three comorbidities and HMO enrollment were associated with mammography use. Having more comorbidities likely increases the contact with health care providers, leading to a higher likelihood of receiving preventive care such as screening mammography [20, 21]. After adjusting for patient

characteristics and health factors, women with no and moderate disability had similar levels of mammography use. However, the effect may not be noticeable because our definition of disability included a gradient of physical dysfunction did not differentiate between mild and moderate disability.

Mammography guidelines do not reinforce testing older women with disability with shortened life expectancy or multiple comorbidities, in order to avoid over diagnosis and overtreatment [22–26]. For example, a false-positive mammogram could lead to sonography, fine-needle aspiration and excision. Even a true-positive biopsy may result in complications from a premalignant condition that would not progress to invasive cancer during the patient's lifetime [27–29]. Harm could result from adhering to disease-specific guidelines [22–26]. Therefore, the decision to screen is best made case by case.

Reasons for not having mammography

The overwhelming majority of respondents reported no need for the test or lack of a doctor's recommendation as the main reasons for not receiving mammography. Several factors may explain this. Women 75 years may benefit from mammography depending on life expectancy and weighing the burden of the test itself [27–32]. The benefits of screening for a woman aged 75 years (average life expectancy, 14.2 years), or for a woman aged 85 years (with 6.9 years of remaining life) [33, 34] are uncertain, given their risk of dying from an unrelated condition. The benefit of early detection of tumors should be made on a case-by-case basis, not by age [35]. Respondents also reported that they forgot the test, which can be addressed by calling with reminders. Access may be improved by using wheelchair accessible mobile units during community events. Women with disability also reported experiencing pain and disliking the test. Providing information and counsel reduces anxiety and improves cooperation during the procedure. These women often need physical accommodations for their disability, making tests less painful. If a woman is identified as having a disability when making the appointment, extra time for accommodations and counseling is advised.

What is appropriate mammography screening in the context of disability?

The decision to screen is complex, involving patient preferences and expectations, cognitive ability and uncertain life expectancy. Disability and multiple comorbidities may limit physical access [29]. A decision not to screen a woman with disability may reflect a clinician's assessment of the patient's life expectancy or quality of life, often incongruent with that of the patient [36], resulting in under screening and undertreatment.

Increasing levels of disability lowers the likelihood of receiving mammography. Common reasons cited for underutilization were lack of physician recommendation, pain or discomfort, forgetting an appointment and transportation problems. Efforts should be made to apply existing criteria to screening older women with disability who can benefit from the test.

Acknowledgments

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Table 1

Demographic and other characteristics of the study population, cohort 2004–2005

	Disability level			
	None	**Moderate**	**Severe**	*P* value
Survey, *n* (total *n* = 4,610)	2,329	1,325	956	
Population, in millions	8.97	4.62	3.19	
Age, years (mean ± SD)	75 ± 5.6	78 ± 7.3	79 ± 7.8	<0.0001
Race, %				
White	81.8	78.6	77.1	0.1064
Black	7.4	8.9	9.9	
Hispanic	7.0	7.8	7.6	
Other	3.8	4.7	5.4	
Married, %	46.9	36.4	30.1	<0.0001
Zip code income $25,000, %	57.4	68.0	75.6	<0.0001
Education <12 years, %	22.6	32.9	38.3	<0.0001
HMO, %	18.9	14.7	15.3	0.0127
SSDI, %	4.0	8.5	13.0	<0.0001
No. of comorbidities, %				
0	52.7	29.7	26.5	<0.0001
1	33.5	40.3	33.2	
2	10.1	20.1	23.3	
3	3.7	9.9	17.0	
Self-rated health, %				
Fair/poor	7.3	27.8	48.2	<0.0001
Cognitive deficit, %	6.8	21.0	36.5	<0.0001
Depressed in last 12 months, %	3.0	6.5	11.3	<0.0001

HMO health maintenance organization, *SSDI* social security disability insurance

Table 2

Models of logistic regression on mammography use and disability, unadjusted and adjusted for relevant confounders and covariates, cohort 2004–2005

	Model 1		Model 2		Model 3	
	OR	95% CI	OR	95% CI	OR	95% CI
Disability						
No	1.00		1.00		1.00	
Moderate	0.76	0.64 0.91	0.98	0.82 1.17	0.98	0.81 1.18
Severe	0.46	0.40 0.54	0.65	0.55 0.78	0.67	0.54 0.83
Age			0.95	0.94 0.96	0.95	0.94 0.96
Race (%)						
White			1.00		1.00	
Black			1.21	0.96 1.51	1.23	0.98 1.54
Hispanic			0.90	0.71 1.14	0.92	0.73 1.16
Other			0.66	0.48 0.92	0.67	0.49 0.93
Education						
>12			1.00		1.00	
12			0.75	0.64 0.87	0.75	0.64 0.88
Zip code income						
>$25,000			1.00		1.00	
$25,000			0.66	0.56 0.79	0.67	0.56 0.80
Married						
Yes			1.00		1.00	
No			0.81	0.69 0.95	0.80	0.68 0.94
HMO						
Yes			1.00		1.00	
No			0.74	0.60 0.92	0.74	0.60 0.92
Self-rated health						
Excellent/very good/good					1.00	
Fair/poor					0.80	0.66 0.96
# of comorbidity						
0					1.00	

	Model 1		Model 2		Model 3		
	OR	95% CI	OR	95% CI	OR	95% CI	
1					1.14	0.97	1.34
2					1.21	0.98	1.49
3					1.56	1.13	2.10
Cognitive deficits							
No					1.00		
Yes					0.93	0.75	1.15
Depress in last 12 months							
No					1.00		
Yes					0.99	0.75	1.34

Table 3

Reasons for not having mammography in the year before for cohort 2004–2005, by age and level of disability [% (SE)]

	Age, by disability level								
	65+ years	65–74 years			75 years		
	All	None	Mod	Severe	None	Mod	Severe
Doctor did not recommend	24.0 (1.1)	13.3 (1.9)	17.5 (2.4)	20.6 (3.7)	20.9 (2.0)	29.0 (2.3)	34.3 (2.4)
No need	28.2 (1.6)	29.6 (3.2)	27.4 (5.2)	21.7 (3.7)	31.6 (2.4)	27.4 (2.6)	25.2 (2.4)
Do not like mammogram/pain	12.2 (0.9)	29.6 (3.2)	17.1 (4.0)	19.2 (3.5)	13.6 (1.8)	10.3 (1.7)	10.7 (1.6)
Forgot/missed it	13.7 (1.1)	21.6 (2.9)	21.0 (4.6)	15.3 (3.1)	14.8 (1.8)	8.9 (1.7)	7.8 (1.4)

Note: Only four main reasons are shown in the table. We also examined other reasons (Too ill, Cost of test/insurance does not cover/not worth the money, Test useless, Not recommended every year, Doctor recommended against getting it, Not at risk, Had a mastectomy, Inconvenient/ transportation, Afraid of results, Never heard of it). These reasons were rare with cells count less than 11 subjects. Thus, the corresponding results are not shown to comply with the current cell size suppression policy of the Centers for Medicare and Medicaid