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Mental Illness and Use of Screening Mammography Among Medicaid Beneficiaries

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Abstract

Background—Disparities in receipt of preventive services by people with mental illness have been previously documented. However, whether these disparities extend to screening mammography among individuals experiencing comparable barriers to accessing care has not been fully examined.

Purpose—To determine whether disparities exist in receipt of screening mammography between women with and without mental illness enrolled in Medicaid, a program with documented potential to reduce healthcare disparities.

Methods—Receipt of screening mammography was examined among women aged 50–64 years enrolled in Ohio's Medicaid program during the years 2002–2008 ($n=130,088$). Receipt of annual screening mammography was examined among those with at least one screening mammography during the study period. Mental illness was identified through diagnostic, service, and pharmacotherapy codes ($n=61,661$).

Results—Compared to women without mental illness, more women with mental illness received at least one screening mammography during the study period (38.1% vs 31.7%, $p<0.001$). However, after adjusting for potential confounders, including the presence of comorbid conditions and length of enrollment in Medicaid, women with mental illness were 32% *less* likely to undergo at least one screening mammography (AOR 0.68, 95% CI= 0.66, 0.70). Among those who received at least one screening mammography, fewer women with mental illness received screening mammography on an *annual* basis (5.9% vs 12.7%, $p<0.001$; AOR 0.53 (95% CI= 0.49, 0.56)). For all beneficiaries, each year of enrollment in Medicaid increased the likelihood of screening mammography use by at least 50%.

Conclusions—Medicaid beneficiaries with mental illness constitute a particularly vulnerable population for suboptimal breast cancer screening.

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Individuals with mental illness suffer premature mortality and excess morbidity.^{1–10} Disparities in health services provided to people with mental illness have been documented for preventive services.^{11, 12} Whether these disparities extend to breast cancer screening is not clear. In one study of a privately insured population, women with mental illness and/or substance abuse, regardless of severity, were at risk for underscreening.¹³ However, because of the effects of mental illness on economic self-sufficiency, many mental illness patients are insured through Medicaid – a program with “equalizing impact”¹⁴ (i.e., the potential to attenuate disparities).

This study aims to determine whether, among Medicaid beneficiaries, disparities exist in the receipt of screening mammography between women with and without mental illness. Limiting our study to Medicaid beneficiaries ensures a comparison of utilization measures across subgroups of a population with comparable income and barriers to accessing care.

Methods

Data Sources

The Ohio Medicaid enrollment and claims files for the years 2002–2008 were used. The study population was identified from the enrollment file, and screening mammography was identified from claims data by using diagnosis and procedure codes.

This study was approved by the Case Western Reserve University Cancer IRB, as well as the Ohio Department of Job and Family Services, which administers the Medicaid program.

Study Population

The study population included all women aged 50–64 years, and enrolled in fee-for-service Medicaid during 2002–2008 ($n = 144,497$).

As this study is part of a larger project on breast cancer prevention and control in Medicaid beneficiaries with and without mental illness, Medicaid beneficiaries who were diagnosed with breast cancer in the 1996–2005 period were identified and excluded from this study (3744). Thus, in addition to focusing our search to procedure codes specific to screening mammography listed below, excluding women diagnosed with breast cancer in the aforementioned period provided an additional safeguard against misclassifying diagnostic or surveillance mammography as a screening mammography. Women with intellectual and developmental disabilities (10,665; based on codes listed in Appendix A, available online at www.ajpmonline.org) were also excluded, leaving the study population at 130,088.

Variables of interest

The outcome variable, screening mammography, was identified using the Common Procedural Terminology, 4th Edition code 76092; the HealthCare Common Procedural Coding System codes G0202 and G0203; and the ICD-9-CM codes V76.10, V76.11, V76.12, and V76.19.

Greater screening mammography uptake among longer-term enrollees has been previously documented.¹⁵ Since Medicaid beneficiaries with chronic medical illnesses and/or with mental illness tend to be enrolled in Medicaid for extended periods of time, length of enrollment was accounted for in the multivariable analysis.

Receipt of screening mammography was analyzed as follows: (1) at least once during the study period, and (2) annually, consistent with recommendations by the National Comprehensive Cancer Network and the American Cancer Society.¹⁶ Annual screening mammography was computed by dividing the observed number of mammograms at least 6

months apart by the expected number of mammograms during the length of enrollment in Medicaid during the study period. In contrast to some studies, the current analysis was limited to *annual* screening mammography to women who received at least one screening mammography during the study period.

The main independent variable, mental illness, was identified based on the following indicators: (1) presence of ICD-9-CM diagnosis codes for mental illness and/or alcohol/substance abuse; (2) receipt of mental health services; and (3) prescriptions pertaining to psychiatric conditions. Mental illness was defined by the presence of a diagnosis of mental illness AND EITHER receipt of mental health services OR prescription drugs for psychiatric conditions. To identify women with more serious mental illness, if mental health services were from a psychologist, the algorithm required that there be at least one visit to a psychiatrist, OR at least one psychoactive medication prescription.

Demographic variables included age (50–54 years, 55–59 years, 60–64 years); and race (African-American [regardless of Hispanic ethnicity], and All Others). County of residence (Appalachian, metro, rural, suburban, and unknown) was based on when a beneficiary first Medicaid enrollment span during the study period. Medical comorbidities (0/1) were identified by using all claims data, and according to Elixhauser's classification¹⁷. Last, the length of enrollment in Medicaid during the study period¹⁵ was measured in years.

Analysis

Following descriptive analysis, multivariable logistic regression analysis on screening mammography was conducted to evaluate the association between mental illness and screening mammography after adjusting for potential confounders. As noted above, analysis was conducted of (1) receipt of at least one screening mammography during the study period, and (2) receipt of annual screening mammography among those who received at least one screening mammography during the study period ($n=45,197$). Since length of enrollment was used to define *annual* screening mammography, it was not included in the second multivariable model. SAS version 9.2 was used in all of current analyses.

Results

Table 1 summarizes relevant demographic and health characteristics of the study population, stratified by mental illness. Just under half of the study population was identified with mental illness. Compared to those without mental illness, women with mental illness were more likely to be non-African-American, reside in an Appalachian county, bear medical comorbidities, and be enrolled in Medicaid for longer periods.

The unadjusted proportion of women with and without mental illness receiving at least one screening mammography during the study period was 38.1% and 31.7%, respectively (Table 2). However, after adjusting for potential confounders, and especially for comorbid conditions and length of enrollment in Medicaid, the multivariable logistic regression model indicated a negative association between mental illness and receipt of screening mammography (AOR: 0.68, 95% CI=0.66, 0.70). Each year of enrollment in Medicaid was associated with 51% greater likelihood of receiving screening mammography (AOR: 1.51, 95% CI=1.50, 1.52); data not shown). Among recipients with at least one screening mammography, mental illness was associated with a significantly *lower* likelihood of receiving *annual* screening mammography (AOR: 0.53 [95% CI=0.49, 0.56]).

Discussion

Medicaid beneficiaries with mental illness experience significant disadvantage in breast cancer screening, whether measured by receipt of at least one screening mammography or by the recommended frequency of annual screening. As a comparison, the 2005 National Health Interview Survey (NHIS) documented that nearly 72% of women in the group aged 50–64 years received a mammogram in the prior 2 years.¹⁸ Based on the findings from the present study and that of the aforementioned NHIS study, it was estimated that if women with mental illness were to undergo screening mammography at rates similar to the general population, 350,000 to 650,000 additional women nationwide would undergo screening mammography (Appendix C, available online at www.ajpmonline.org).

The strengths of this study lie in the use of several years of statewide Medicaid data, as well as in the use of a multipronged approach to identifying mental illness, which may have reduced misclassification. This algorithm would exclude people with mental illness who are not receiving treatment, and in whom mammography rates may be even poorer than those reported in our index population.

Limitations include the possibility of incomplete claims data. Although managed care enrollees were excluded from our study population, the dually Medicare–Medicaid enrolled, those on “spend-down,” as well as nursing home residents are represented in the study. However, a sensitivity analysis accounting for all these factors did not yield any notably different results.

Conclusion

In conclusion, women with mental illness are at a high risk for suboptimal breast cancer screening. While increased length of Medicaid enrollment improved uptake of screening mammography, further understanding of the barriers to and facilitators of optimal screening is necessary to improve cancer control in this population.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1Demographic distribution of the study population, by the variables of interest, *n* (%)

Variable of interest	Women without mental illness	Women with mental illness	Total
Age (years)			
50–54	28,369 (41.5)	35,238 (57.2)	63,607 (48.9)
55–59	18,740 (27.4)	15,017 (24.4)	33,757 (26.0)
60–64	21,318 (31.2)	11,406 (18.5)	32,724 (25.2)
Race:			
African-American	17,246 (25.2)	12,941 (21.0)	30,187 (23.2)
All Others	51,181 (74.8)	48,720 (79.0)	99,901 (76.8)
County of Residence:			
Appalachian	12,558 (18.4)	12,634 (20.5)	25,192 (19.4)
Metro	37,470 (54.8)	32,970 (53.5)	70,440 (54.2)
Rural	8,520 (12.5)	7,222 (11.7)	15,742 (12.1)
Suburban	8,977 (13.1)	8,047 (13.1)	17,024 (13.1)
Unknown	902 (1.3)	788 (1.3)	1,690 (1.3)
Medical Comorbidities:			
None	15,412 (22.5)	2,658 (4.3)	18,070 (13.9)
At least one	53,015 (77.5)	59,003 (95.7)	112,018 (86.1)
Length of enrollment in Medicaid (years; [M (SD)])	2.55 (2.29)	3.80 (2.32)	3.15 (2.39)
Total	68,427 (100.0%)	61,661 (100.0%)	130,088 (100.0%)

All comparisons significant at $p < 0.0001$

Table 2

Unadjusted and adjusted association between mental illness and receipt of screening mammography

Mental Illness	Receipt of at least one screening mammography during the study period (<i>n</i> =130,088)		Receipt of screening mammography at the recommended level ^a (<i>n</i> =45,197)	
	Unadjusted proportion, %	AOR (95% CI)	Unadjusted proportion, %	AOR (95% CI)
Absent	31.7	1.0 (ref)	12.7	1.0 (ref)
Present	38.1	0.68 (0.66, 0.70)	5.9	0.53 (0.49, 0.56)

Note: All statistics are significant at $p < 0.0001$.

AORs obtained from logistic models, adjusting for age, race, county of residence, and the presence of comorbid conditions. The variable measuring length of enrollment in Medicaid during the study period was included in the multivariable model for receipt of at least one screening mammography during the study period, but in the model for receipt of annual screening mammography. Of note is that length of enrollment in Medicaid was used to define receipt of annual screening mammography.

^aThis analysis is limited to women who received screening mammography at least once during the study period.