CLINICAL RESEARCH STUDY

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Screening Mammography Use in Medicare Beneficiaries Reflects 4-Year Mortality Risk

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ABSTRACT

OBJECTIVE: Breast cancer screening guidelines recommend that women and physicians consider life expectancy when making screening decisions in older women. However, prior studies suggest that screening mammography patterns are dependent on age rather than health status or mortality risk of women. Our objective is to determine the association between 4-year mortality risk and use of screening mammography in women aged ≥ 65 years using Medicare Current Beneficiary Survey data.

METHODS: The primary predictor variable is 4-year mortality risk derived from a published and validated prognostic index with 4 strata of increasing probability of death in 4 years (risk groups 1, 2, 3, and 4 with 4%, 15%, 42%, and 64% risk of 4-year mortality, respectively). The main outcome was self-reported receipt of mammography in the last year.

RESULTS: There was a significant decreasing trend in the use of mammography with mortality risk groups 1, 2, 3, and 4 (62.7%, 51.5%, 36.6%, and 24%, respectively; trend test $P < .001$). The adjusted odds of mammography use were greatest in the low mortality risk group and show a gradual decline with increasing mortality risk for risk groups 1, 2, 3, and 4 (odds ratio [confidence interval]): 1.00; 0.69 [0.53-0.90]; 0.37 [0.27-0.49], and 0.22 [0.13-0.36], respectively.

CONCLUSION: Screening mammography use in older Medicare beneficiaries seems to reflect their 4-year risk of mortality rather than age alone, suggesting that patients and providers consider prognosis in screening decisions. Prospective studies are needed to explore the use of the prognostic index as a mammography screening decision tool.

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Medicare began to cover screening mammography in 1991, and there has since been a steady increase in screening mammography rates among older women.[1-4] Because of competing risks of mortality in elderly and the lead time conveyed by screening mammography, the net mortality benefits from cancer screening depend on life expectancies.[5,6] Given these facts, national breast cancer screening guidelines suggest considering life expectancy in screening decisions for older women.[7,8]

Recent observational studies showed that regular mammography among older women was associated with earlier disease stage and thus supported the use of screening mammography among healthy older women.[9,10] However, limited research has addressed whether screening mammography, with improved access via Medicare, is targeted to healthy older women who would benefit most from screening and avoided in women with limited life expectancies. Previous studies that examined the association between health status/mortality risk and screening mammography found that age was a stronger predictor of recent screening rather than health status or mortality risk.[11,12] Some of the prior studies only examined the association between health status (proxy for mortality risk) and screening mammogra-

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phy.[11,13] Those studies that used prognostic indexes for mortality risk were limited. In one study, the prognostic index of mortality was not validated,[12] and in the other study, the index was less clinically applicable.[14]

However, Williams et al[15] used a validated prognostic index to assess the influence of wealth on screening mammography by prognosis in Medicare beneficiaries. This prognostic index for 4-year mortality incorporating age, comorbid conditions, and functional status variables was developed and validated in community-dwelling older adults by Lee et al.[16] On the basis of the risk score derived from the prognostic index, patients were stratified into very high, high, intermediate, and low-risk groups for 4-year mortality. We used this prognostic index to determine the association between 4-year risk of mortality and mammography use among female Medicare beneficiaries (≥65 years of age) in a cross-sectional study using Medicare Current Beneficiary Survey (MCBS) data from 2002.

CLINICAL SIGNIFICANCE

- Breast cancer screening guidelines recommend that women and physicians consider life expectancy when making screening decisions in older women.
- Screening mammography use in older Medicare beneficiaries seems to reflect their 4-year risk of mortality (life expectancy) rather than age alone, suggesting that patients and providers consider prognosis in mammography screening decisions.

MATERIALS AND METHODS

Data Source

Data used for this study are from the Cost and Use module of 2002 MCBS. The MCBS is a continuous, multipurpose survey of a nationally representative sample of Medicare beneficiaries. MCBS, which is sponsored by the Centers for Medicare & Medicaid Services, provides comprehensive information on the health status and functioning, health services and expenditures, health insurance coverage, access to care, and a variety of socioeconomic demographic and behavioral characteristics of the entire spectrum of Medicare beneficiaries. The interviews in 2002 Cost and Use file had an overall response rate of 70.4%. Further details about the survey are available at the Centers for Medicare & Medicaid Services website.[17]

Study Population

The potential analytic cohort for the study included 5554 noninstitutionalized female Medicare beneficiaries, aged ≥ 65 years, who participated in the survey. Women with a self-reported history of breast cancer were excluded. In addition, we excluded women who were missing data on prognostic index (4-year risk of mortality) or recent mammography use, resulting in a sample size of 4836 in the final analyses (Figure 1).

Data Collection and Measurements

The outcome of interest in our study was self-reported receipt of mammography in the last 1 year. Participants' answers to a series of questions about the receipt of preventive care are recorded in the health status and functioning community component of the MCBS 2002. Mammography use was defined on the basis of response to the question "Have you had a mammogram or a breast x-ray in the past year? (yes/no)."

The primary independent variable was 4-year mortality risk assessed by using the 4-year mortality prognostic index published by Lee et al.[16] This index was developed and validated in a population of community-dwelling US adults aged more than 50 years using the 1998 wave of the Health and Retirement study. The index includes 12 weighted variables (age, sex, body mass index, smoking status, 4 comorbid conditions, and 4 functional status variables) that are independently associated with mortality. The prognostic index is a 12-item questionnaire with each question representing an independent predictor of mortality. By using the MCBS data, the answers to these 12 questions were scored as shown in the prognostic index so that a risk score could be calculated for each participant (Appendix 1). The wording of the questions assessing the 4 functional variables in the MCBS questionnaire differs slightly from the actual questions in the prognostic index. The point score ranges from 2 to 21 with increasing risks of mortality.

Control variables included demographic, socioeconomic variables, and health care access and use variables known to

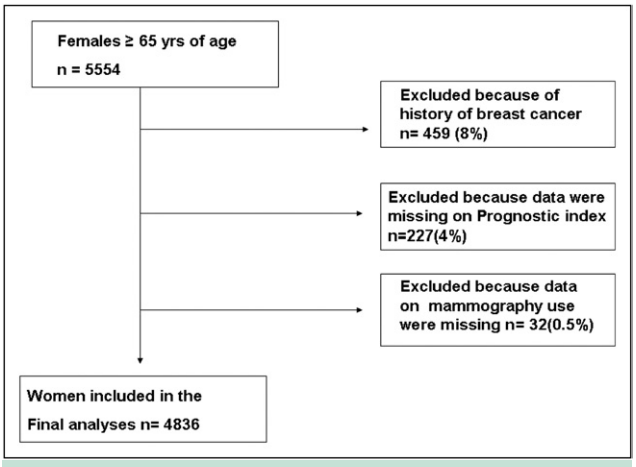

Figure 1 Flow diagram of women included in the final analyses examining the relationship between prognostic index and mammography use.