ORIGINAL ARTICLE

Breast Cancer Screening in Patients With Newly Diagnosed Lung and Colorectal Cancer: A Population-Based Study of Utilization

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Abstract

Purpose: To assess breast cancer screening utilization in Medicare beneficiaries with colorectal and lung cancer versus cancer-free controls.

Methods: Female fee-for-service Medicare beneficiaries who were ≥67 years old and diagnosed with lung or colorectal cancer between 2000 and 2011 and who reported to a Surveillance, Epidemiology, and End Results (SEER) registry (case group) were followed for 2 years after their diagnoses, unless death, a diagnosis of breast cancer, or the end of 2013 came first. A similar number of cancer-free controls were individually matched to cases by age, race, registry region, and follow-up time. Screening utilization was defined as the percentage of women with ≥1 screening mammogram during follow-up.

Results: Overall, 104,164 cases (48% colorectal, 52% lung; 30% advanced cancer) and 104,164 controls were included. Among women with lung or colorectal cancer, 22% underwent ≥1 screening mammogram versus 26% of controls (odds ratio [OR] 0.80; 95% confidence interval [CI] 0.78-0.82). Stratified by cancer type, 28% of colorectal cancer cases versus 29% of controls (OR 0.98; 95% CI 0.95-1.01) and 17% of lung cancer cases versus 23% of controls (OR 0.63; 95% CI 0.60-0.65) received ≥1 mammogram. When stratified by stage, 8% with advanced cancer versus 18% of controls (OR 0.33; 95% CI 0.31-0.35) and 30% with early-stage cancer versus 30% of controls (OR 1; 95% CI 0.97-1.02) underwent ≥1 mammogram.

Conclusion: Screening mammography utilization rates are similar between Medicare beneficiaries with early-stage cancer versus controls. Although the majority of patients with advanced-stage cancer appropriately do not pursue screening mammography, a small number (8%) continue with screening.

Key Words: Screening mammography, cancer survivorship period, utilization, population-based

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INTRODUCTION

Advances in early cancer detection and treatment have led to an approximate 20% decrease in mortality between 1991 and 2010 [1]. In general, cancer survivors are at increased risk of developing second primary malignancies [2] from genetic syndromes, shared etiologic factors, or late sequel of treatment. These second malignancies account for 16% of all cancer diagnoses [3]. Lung and

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colorectal cancer survivorship, however, does not seem to increase the risk of subsequent breast cancer [4-6]. Accordingly, breast cancer screening rates in survivors of early-stage lung and colorectal cancer are expected to be similar to those in a cancer-free population. However, life expectancy of cancer survivors varies by disease stage. Routine screening may not benefit those presenting with advanced cancer, driving unnecessary health care costs [7].

The utilization of cancer screening tests during cancer survivorship is multifactorial and involves considerable discretion by the treating physician [8], who needs to assess the patient's life expectancy and communicate that prognosis to the patient. Sometimes, screening tests are performed at patients' requests, even if contrary to guidelines. Patients sometimes use their primary cancer diagnosis as a behavior-changing event or use denial as a coping strategy [7,9]. Furthermore, variation and uncertainty exist among health care practitioners about the best use of cancer screening in patients with existing cancer diagnoses.

Studies from over two decades ago reported a slight but not significant increase in screening mammography utilization in colorectal cancer survivors after their cancer diagnosis [10,11]. Considerable interval changes in breast cancer screening utilization overall [12-15], breast cancer screening guidelines [16,17], increased breast cancer awareness [18], and decreased mortality of cancer survivors [1] warrants a re-evaluation of the rate, frequency, and interval of screening mammography utilization in the broad population of patients with a new cancer diagnosis (compared with a cancer-free population). In addition to understanding contemporary rates of screening utilization, information about the distribution of screening utilization by stage at diagnosis could guide initiatives to ensure more appropriate screening.

The purpose of this study was to compare utilization rates of breast cancer screening in women 67 years or older with a new diagnosis of colorectal or lung cancer to screening rates (1) in a cancer-free Medicare control group and (2) in the same patients in the 2 years before their primary cancer diagnosis. We further compared utilization rates for individuals with late- versus early-stage diagnoses and then explored predictors of screening mammography within the case population.

METHODS

Institutional Review Board approval and a waiver of informed consent were both obtained for this HIPAA-compliant retrospective review of linked Surveillance, Epidemiology, and End Results (SEER) Program and Medicare carrier claims data.

Data Source

We used SEER-Medicare, a cancer registry and claims-based database of medical care received by Medicare beneficiaries with cancer. The database includes SEER program information from cancer registries in 13 states or metropolitan areas (18 registries covering approximately 28% of the US population) and fee-for-service claims for covered health care services (both Parts A and B benefits) for all SEER registry Medicare beneficiaries from the time of a person's Medicare eligibility until death [19,20]. The linkage of SEER with Medicare data used for this study was last updated in 2014 [19].

Study Population

Cancer Cases. All Medicare-enrolled women 67 years or older registered in SEER between 2000 and 2011 with a diagnosis of colorectal or lung cancer were assessed for eligibility. These specific cancers were selected because they represent the most common nonbreast malignancies in women [21]. We excluded all patients in whom colorectal or lung cancer was not their first primary cancer, as well as those with an unknown month of cancer diagnosis, a diagnosis reported only from autopsy or death certificate, a date of death before date of diagnosis, or a death or breast cancer diagnosis within the first 3 months after the colorectal or lung cancer diagnosis. To ensure complete claims capture, we only included patients continuously enrolled in Medicare Parts A and B and not enrolled in a Medicare HMO from 2 years before cancer diagnosis to a follow-up end date defined as 2 years and 3 months after diagnosis, a diagnosis of breast cancer, death, or the censoring date of December 31, 2013, whichever came first. We defined patients with advanced cancer as those with SEER-derived American Joint Committee on Cancer (AJCC) [22] stage IV colorectal cancer and IIIB-IV lung cancer, which have an estimated overall 5-year survival of 5% and 3%, respectively [7].

Cancer-Free Controls. A matched cohort of female fee-for-service Medicare enrollees without cancer with sufficiently complete demographic information was identified from a random 5% sample of Medicare fee-for-service beneficiaries residing in SEER areas. Each cancer patient was individually matched to a cancer-free control by birth year, race, and registry region. As with cancer cases, we only included controls continuously enrolled in Medicare Parts A and B between the date of the corresponding case diagnosis and case follow-up end date. Each control had exactly the same amount of follow-up time as her corresponding cancer case.