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Defining care provided for breast cancer based on medical record review or Medicare claims: information from the Centers for Disease Control and Prevention Patterns of Care Study

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ABSTRACT

Background: Description of care patterns is important as evidence-based guidelines increasingly dictate care. We explore the level of agreement between claims and record abstraction for guideline concordant multidisciplinary breast cancer care.

Methods: From the U.S. Centers for Disease Control and Prevention's National Program of Cancer Registries Patterns of Care study, in which medical record abstraction of breast cancer and treatment was accomplished, cases include breast cancer where Medicare claims were available. Components of care were breast-conserving surgery (BCS), mastectomy, node assessment, radiation (RT), and chemotherapy (CTX), including specific chemotherapeutic agents, and combinations. We compared Medicare claims with record abstraction, and measured concordance using the kappa statistic and sensitivity.

Results: The study sample consisted of 1762 women with stage 0 to 4 breast cancer. Level of agreement was excellent for surgery type (kappa = 0.84) and CTX (kappa = 0.89); agreement for RT therapy was slightly lower (kappa = 0.79). For standard multicomponent strategies, sensitivities and specificities were high; for example, 88.8%/93.5% for mastectomy plus nodes and 86.6%/95.4% for BCS plus nodes and RT. For selected, standard, multi-agent, adjuvant CTX regimens, sensitivities ranged from 66.3% to 68.8% (kappa 0.63–0.73).

Conclusions: Medicare claims, compared with chart abstraction, is a reliable method for determining patterns of multicomponent care for breast cancer.

Introduction

Treatment guidelines, taking into account tumor and patient characteristics, have been promulgated for various types of cancer [1]. Despite this strive toward consistency, presumably within the bounds of evidence-based practice, there is room for different strategies of cancer care, based for example on sequencing of surgery, radiation (RT), and chemotherapy (CTX), and the choice/mix of chemotherapeutic agent(s). It becomes ever more important, therefore, to document treatment patterns and to study the efficacy of different patterns on clinical outcomes such as complications, recurrence, and survival. Medical claims and record review are two sources of information used to analyze treatment patterns; both have their limitations. Given the greater convenience and lower costs of claims data, ensuring their comparability with medical records is important.

In describing patterns of care for breast cancer, there are known discrepancies in medical claims compared with chart review or tumor registry data with respect to type of surgery and receipt of CTX and RT. Comparing Medicare claims to Surveillance,

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Epidemiology, and End Results (SEER) data, the level of agreement for type of surgery was 88.0% for breast-conserving surgery (BCS) and 94.5% for mastectomy and the sensitivities, claims to SEER, were 91.3% and 87.9% for BCS and 96.2% and 96.0% for mastectomy using either inpatient or physician claims, respectively [2]. For determining use of CTX, the sensitivity of Medicare claims to chart review was 91% [3]. In another study [4] there was a high level of agreement between SEER-Medicare claims and National Cancer Institute-supported Patterns of Care Studies (POC) medical chart review data for use of CTX (kappa 0.73), and a sensitivity of Medicare claims to re-abstracted data of 88% for breast cancer. With respect to RT treatment, comparison of Medicare claims with SEER data finds a sensitivity of 93%, claims to SEER data [5] and comparison of SEER-Medicare linked data to claims data report high levels of agreement in lung (88%), prostate (94%), rectal (94%), breast (94%), and endometrial cancers (95%) [6].

The level of agreement between claims and records according to most of these studies seems to be reasonably high. However, there is little evidence in the literature regarding whether strategies of care with multiple components (surgery, RT, CTX) or specific multiple agent chemotherapeutic regimens have as high a level of agreement. The purpose of this study was to examine the level of agreement between the two data sources regarding various treatment patterns for a sample of breast cancer patients. Our study uses cancer registry data augmented by medical record re-abstraction as the gold standard to which claims data are compared. This study advances the literature by comparing claims with records for both single and multiple components of cancer therapy, including examination of specific chemotherapeutic agents.

Methods

We used data from the U.S. Centers for Disease Control and Prevention's National Program of Cancer Registries Breast and Prostate Cancer Data Quality and Patterns of Care study, a cross-sectional study of patterns of care for breast and prostate cancer. In this study, data pertaining to cancer and its treatment from cancer registries in seven states (California, Georgia, Kentucky, Louisiana, Minnesota, North Carolina, and Wisconsin) were augmented by abstracting from various medical record sources (e.g., hospital, RT facility, and oncology offices). For this article, we included 7193 cases of newly diagnosed female in situ and invasive breast cancer from patients California, Georgia, Kentucky, Louisiana, and North Carolina, from which we had Institutional Review Board approval to send unique patient identifiers to the Centers for Medicare and Medicaid Services for linkage to Medicare claims. Patients were diagnosed with breast cancer in 2004; Medicare claims were linked for 2003 through 2005, although in this analysis we used only claims from 2004 through 2005. Claims from 2003 were used for other research [7]. Treatment was measured during a 1-year window after the 2004 breast cancer diagnosis. Of the 7193 patients from these five states, we eliminated 4778 because they were younger than 65 years old, 650 because they had incomplete Medicare Part A and B insurance or some managed care (e.g., health maintenance organization [HMO]) coverage, and 3 patients because they had no Medicare claims, during the 1-year time window after cancer diagnosis. A final sample of 1762 patients was used in this analysis.

Treatment assessment

Medical records

Abstractors from each of the states re-abstracted treatment information from in- and out-patient medical records and verified it with treating physicians when medical records were insufficient for confirming treatment or there was an indication that information on therapy was incomplete. Comparison of re-abstracted to original frozen registry data is reported elsewhere [8]. Thus, each patient was assigned one of the following physician verification codes: (1) No physician verification; (2) physician verification; (3) unified chart (e.g., from an HMO); and (4) hospital chart only. We applied the standard North American Association of Central Cancer Registries data collection rules to collect information on "first course of treatment." This information is derived from a treatment plan, when available, and can extend up to one year or more after cancer diagnosis. We used a surgery variable with BCS codes for partial mastectomy, lumpectomy, excisional biopsy, segmental mastectomy, and reexcision of the biopsy site, and with mastectomy codes for subcutaneous mastectomy, total (simple) mastectomy, modified radical mastectomy, radical mastectomy, extended radical mastectomy, and mastectomy not otherwise specified (NOS). Both BCS and mastectomy were categorized with or without nodal assessment. Both RT therapy and CTX were defined by variables summarizing the receipt of either or not. For CTX, we also abstracted specific chemotherapeutic agents and regimens.

Claims

Treatment information from claims was derived from all available files (hospital, outpatient, physician, hospice, home health, durable medical equipment, and skilled nursing) using a 1-year period after cancer diagnosis. With the physician claims, we only used those claims on which the "service code" was identified as "medical," "surgical," or "consultation," with the rationale being that these claims might be more consistently recorded or "directed" by physicians. Claims from other services, for example radiology and laboratory, were excluded as were claims with nonphysician "specialty codes," such as those pertaining to medical supply companies, physical or occupational therapists, and pharmacy. We categorized treatment into six groups: (1) BCS with nodal assessment (BCS + nodes); (2) BCS without nodal assessment (BCS-nodes); (3) mastectomy with nodal assessment; (4) mastectomy without nodal assessment; (5) RT; and (6) CTX, which include both single agents, and multiple agent combinations with standard regimens defined by the National Comprehensive Cancer Network guidelines. Although groups 1 through 4 are mutually exclusive, a patient may also receive treatment from groups 5 and/or 6. BCS was defined as the final surgical procedure if there were procedure codes for excisional biopsy, partial mastectomy, segmentectomy, or lumpectomy, and no subsequent mastectomy. Conservatively, we defined receipt of CTX on the basis of specific CTX drugs codes, and RT therapy on the basis of RT therapy treatment codes. Surgery and lymph node assessment were defined on the basis of specific codes for each. For a list of diagnosis and procedure codes that constitute each of these categories, please refer to Appendix A.

Statistical analysis

Our primary analysis compares the elements of treatment (BCS ± nodes, mastectomy ± nodes, RT, CTX) from claims with the same elements derived from the re-abstraction of medical records. We report concordant and discordant cases, sensitivity, and kappa statistics for each treatment component (e.g., surgery, RT, CTX) and all possible combinations of these components, and interpret the kappa statistics using the following acceptable rules [9]: excellent (0.81–1.00), substantial (0.61–0.80), moderate (0.41–0.60), fair (0.21–0.40), slight (0.00–0.20), and poor (<0.00). We also compare claims to medical records for specific chemotherapeutic agents, and multiple agent strategies, with concordant and discordant cases, sensitivity, and kappa statistics and derive the prevalence of various