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Disparities in Radiation Oncology

Racial disparities in guideline-concordant cancer care and mortality in the United States

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Abstract

Purpose: We identified the frequency of racial disparities in guideline-concordant cancer care for select common disease sites in the United States and the impact of guideline concordance on mortality disparities.

Methods and materials: Using Surveillance, Epidemiology, and End Results Medicare data, we evaluated patients age >65 years of black or non-Hispanic white race who were diagnosed with stage III breast (n = 3607), stage I (n = 14,605) or III (n = 15,609) non-small cell lung, or stage III prostate (n = 3548) cancer between 2006 and 2011. Chemotherapy, surgery, and radiation therapy (RT) treatments were identified using claims data. Pearson χ^2 was used to test the associations between race and guideline concordance on the basis of National Comprehensive Cancer Network curative treatment guidelines. Mortality risks were modeled using Cox proportional hazards.

Results: Black patients were less likely to receive guideline-concordant curative treatment than non-Hispanic white patients for stage III breast cancer postmastectomy RT (53% black, 61% white; $P = .0014$), stage I non-small cell lung cancer stereotactic radiation or surgery (61% black, 75% white; $P < .0001$), stage III non-small cell lung cancer chemotherapy in addition to RT or surgery (36% black, 41% white; $P = .0001$), and stage III prostate cancer RT or prostatectomy (82% black, 95% white; $P < .0001$). Disparities in guideline concordance impacted racial mortality disparities. Specifically, hazard ratios that demonstrated elevated all-cause mortality risks in black patients were lowered (and more closely approached hazard ratio of 1.00) after adjusting for guideline concordance. A similar impact for cause-specific mortality was observed.

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Conclusions: Racial disparities in the receipt of curative cancer therapy impacted racial mortality disparities across multiple cancer sites. Benchmarking adherence to guideline-concordant care could represent an opportunity to stimulate improvements in disparities in cancer treatment and survival.

Introduction

Racial disparities in cancer treatment and outcomes have been demonstrated in several population-based studies but targets for interventions to improve disparities have been challenging to identify.[1,2] Studies have shown disparities in cancer-specific mortality among black versus non-Hispanic white patient populations with breast, lung, and prostate cancer, which are the leading causes of cancer death among men and women in the United States.[3-7] The adoption of evidence-based cancer treatments[8,9] in black patient cohorts has similarly lagged behind that of white patients.[4-7,10]

Cancer treatment guidelines have been developed to promote evidence-based cancer treatment and consequently outcomes.[11] Whether guideline concordance—or disparities in such concordance—meaningfully impacts racial disparities in cancer outcomes is not known. Quantifying the magnitude of racial disparities in the use of standard treatments across the United States is an important step toward identifying and ultimately targeting a reduction in barriers to high-quality cancer care.

Accordingly, we sought to more comprehensively understand guideline-concordant practice in black and white patients with cancer. We sought to quantify the frequency and magnitude of disparities across disease sites in key patient cohorts in which curative treatments are delineated in national practice guidelines,[11] understand the impact of racial disparities on mortality, and understand the impact of guideline-concordant care on racial disparities in mortality. We hypothesized that racial disparities exist in the practice of guideline-concordant care. We further hypothesized that guideline concordance would be a significant contributor to racial disparities in cancer outcomes even after adjustment for discrepancies in clinical and socioeconomic status (SES) factors.

Study methods

Data source and patient cohort

We used the Surveillance, Epidemiology, and End Results (SEER) Medicare data set to examine oncology treatment utilization (ie, chemotherapy, surgery, and radiation) in patients age >65 years with incident American Joint Committee on Cancer stage III breast cancer, stage I non-small cell lung (NSCLC), stage III NSCLC, or stage III prostate cancer between 2006 and 2011. The period of analysis was chosen to evaluate the use of well-established curative treatment guidelines with sufficient follow-up time for analysis of mortality outcomes. The stages/therapies were chosen based on availability of evidence that observation is not considered a standard curative option (eg, in stage I-II prostate cancer, some patient subsets are considered eligible for observation or active surveillance where appropriateness of treatment could not be evaluated on the basis of administrative claims).

We sequentially excluded patients with a prior history or diagnosis of a secondary malignancy within the first year of diagnosis, unknown histology, no pathologic confirmation, and cancer diagnosis at the time of autopsy/by death certificate (eTables 1-3; available as supplementary material online only at www.practical.radonc.org). Full Medicare Parts A and B coverage and no health maintenance organization enrollment 12 months prior to and 12 months after diagnosis was required. Patient and disease factors at the time of diagnosis that were extracted from SEER data included age, diagnosis year, disease stage, and tumor grade. Final samples included 3607 patients with stage III breast cancer; 14,605 patients with stage I and 15,609 patients with stage III NSCLC; and 3548 patients with stage III prostate cancer.

Race

Patients of black and non-Hispanic white race were categorized as documented by SEER. Patients of Hispanic white and Asian Pacific Islander race were excluded due to the relatively small sample sizes.

Other covariates

A modified Charlson comorbidity index was derived based on Medicare diagnosis claims for noncancer, comorbid diseases[12-14] that occurred between 12 months prior and up to 1 month before the cancer diagnosis date. As established in prior studies, to enhance specificity, diagnosis codes identified in Part B files must have occurred in 2 separate claims over >30 days or also in Part A claims.[15,16] A score that indicates that performance status was derived from the Medicare Durable Medical Equipment file with use of home oxygen, cane, commode, wheelchair, or hospital bed,[17,18] was categorized as 0 (none), 1 (1 equipment item), or 2 (2 or more items).[17]

SES covariates were derived from the Area Health Resources File linked by county and included rural and urban