Racial Disparities in Health-Related Quality of Life After Lung Cancer Surgery

Findings From the Cancer Care Outcomes Research and Surveillance Consortium

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Introduction: This study investigated racial disparities in postsurgical health-related quality of life (HRQOL) among patients with non–small-cell lung cancer (NSCLC).

Methods: Data were collected by the Cancer Care Outcomes Research and Surveillance Consortium. Inclusion criteria were greater than or equal to 21 years of age, NSCLC, and receipt of surgery. HRQOL data were available from patients' surveys, and complete medical record abstraction was performed to obtain clinical data. HRQOL was assessed by the physical/mental component summary scores (PCS/MCS) of the 12-item Short-Form Health Survey at two time points. Mean time between surgery and the initial assessment (time 1) after surgery was 4.1 (SD 2.2) months and between surgery and second assessment (time 2) was 12.7 (SD 3.8) months. Multivariable linear regression models were used to examine associations between race and HRQOL.

Results: Of 650 patients, 80.5% were White, 8.8% Black, and 10.7% other races. At second assessment, Blacks reported lower MCS than Whites (47.4 versus 52.6, $p = 0.002$). In multivariable analysis, Blacks had lower MCS compared with Whites. No difference was found between Whites and Blacks on PCS. Those with less than high school education reported lower MCSs. Older age and receipt of adjuvant chemotherapy after surgery were associated with gain in MCS. Male, less than college education, and comorbidities were associated with impaired PCS. Older age was associated with improved PCS.

Conclusion: Racial disparities exist in postoperative mental HRQOL. Results highlight the need for interventions after lung cancer surgery to improve mental health in Black and younger patients.

Key Words: Non–small-cell lung cancer, Surgery, Racial disparities, Health-related quality of life.

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Lung cancer is the leading cause of cancer-related death in the United States. It is estimated that there will be 224,210 new lung cancer cases and 159,260 deaths from lung cancer in 2014.[1] Blacks suffer a greater burden of disease from lung cancer compared with other racial/ethnic groups and tend to have higher prevalence and mortality from lung cancer.[2,3] Despite advances in treatment, compared with Whites, Blacks with lung cancer have lower 5-year survival rates (16% versus 13%),[4] are less likely to undergo invasive staging,[5] and receive surgical resection less frequently (63.4% versus 44.7%).[6]

Surgical resection remains the best available treatment to enhance long-term survival for patients with early-stage (stages I and II) non–small-cell lung cancer (NSCLC). The 5-year postoperative survival rate for patients with stage I NSCLC ranges from 55% to 72%. If not treated surgically, the 5-year survival rate ranges from 4% to 14%.[7] However, lung cancer surgery has the potential to negatively affect health-related quality of life (HRQOL).[8–10] Studies have reported that HRQOL was lower during the first 3 to 6 months after surgery and then improved over time.[9,11,12] A recent study found that at 6 months after lung cancer surgery 59% of patients reported lower physical HRQOL and 33% reported lower mental HRQOL compared with preoperative HRQOL.[8]

HRQOL in patients with lung cancer from different racial groups is of particular interest because when compared with their White counterparts, Black patients have poorer HRQOL,[13] and it has been found that poor HRQOL is strongly associated with increased risk of death among lung cancer patients.[14] In fact, 10% decrease in physical and mental HRQOL during the first 6 months after lung cancer surgery was associated with 18% and 13% increased risk of death, respectively.[14] The relationship between an individual's racial background and postoperative HRQOL is complex and may be mediated by patients' demographic, socioeconomic (e.g., income, education), and clinical (e.g., disease stage, comorbidities) characteristics. Previous studies demonstrated that

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Blacks are more likely than Whites to report lower household income,[6,15] education attainment,[6,16] being uninsured or covered by Medicaid,[6,17,18] being unmarried,[6,19] being diagnosed at advanced-stage lung cancer (stage III or IV),[18,20] at a younger age,[20] have greater prevalence of comorbidities,[21,22] and less likely to successfully quit smoking,[23] and all these factors are associated with HRQOL of lung cancer patients.[10,24–27] Although several studies examining HRQOL after lung resection have been conducted over the past decade,[10] the relationship between race and HRQOL is poorly understood. Literature suggests that several factors (e.g., higher rates of poverty, lack of health insurance, more advanced stage at diagnosis) may account for a substantial part of the observed racial/ethnic differences in lung cancer outcomes.[28,29] To our knowledge, no studies have analyzed the effect of race on HRQOL while controlling for these important factors. Thus, we performed a prospective population-based study to investigate racial disparities in postsurgical HRQOL among a cohort of patients with newly diagnosed NSCLC and identified characteristics associated with HRQOL after lung cancer surgery. Because prior research indicates substantial racial/ethnic differences in lung cancer outcomes,[2,28,30,31] it is possible that differences regarding HRQOL after surgical procedure may also exist. We hypothesized that Blacks would report less improvement in physical and mental HRQOL than Whites after controlling for demographic, socioeconomic, and clinical factors. To enhance HRQOL after lung cancer surgery, it is important to identify subgroups of lung cancer patients with an increased risk of poor HRQOL, then to develop appropriate interventions that can be delivered after lung cancer surgery. Enhancing HRQOL after lung cancer surgery might ultimately improve survival.

MATERIALS AND METHODS

Data Source

Data for this study were collected by the Cancer Care Outcomes Research and Surveillance (CanCORS) Consortium. The consortium examined variations in care and outcomes of care for patients with newly diagnosed lung and colorectal cancers between 2003 and 2005 with follow-up data for as long as 15 months after diagnosis.[32] Data were collected from patient surveys, medical records abstraction, physician surveys, and surveys of informal caregivers using computer-assisted telephone interviews in English, Spanish, and Mandarin and Cantonese Chinese.[33] Details on study design and procedures have been previously published.[32,34] Patients were living in Northern California, Los Angeles County, North Carolina, Alabama, Iowa, or received care in one of the five large integrated health care systems or in one of the 15 Veterans Health Administration hospitals. In 2004, the study catchment areas included nearly 30 million people, representing 10% of the United States population.[32,33] Human subjects committees at all participating institutions approved the study. In this analysis, we used data from two different sources: (1) patient surveys obtained approximately 4 months after diagnosis (time 1) and again approximately 11 to 13 months after diagnosis (time 2) and (2) medical records from physicians involved in the patients' cancer care from 3 months before to 15 months after diagnosis.[32] The majority of newly diagnosed lung cancer patients had surgery before the first patient survey (time 1).

Study Population

Forty-nine percent of eligible patients with lung cancer participated in the CanCORS study.[34] Comparisons of responders and nonresponders have been described previously.[35] In the CanCORS sites affiliated with Surveillance, Epidemiology, and End Results registries, the CanCORS cohort was similar to Surveillance, Epidemiology, and End Results in ethnic distribution (Black, 11.8% versus 9.8%; Hispanic, 4.8% versus 5.3%; Asian, 3.6% versus 4.7%).[34]

In the CanCORS cohort, there were a total of 1228 patients aged greater than or equal to 21 years with diagnoses of NSCLC who received primary surgery and had accompanying medical records data available (Fig. 1). Then, 109 patients were dropped because they lacked at least 3 months between the baseline and follow-up surveys. The HRQOL data were available from baseline and follow-up surveys from 844 patients. Another 194 observations were dropped because of lost from nonimputed items in the 844 patients with at least some data from both the baseline and follow-up survey. The CanCORS team applied sequential iterative imputation algorithms to fill in many missing items but excluding certain patient attributes that could not be accurately imputed, e.g., race. Multiple imputed models were only constructed for

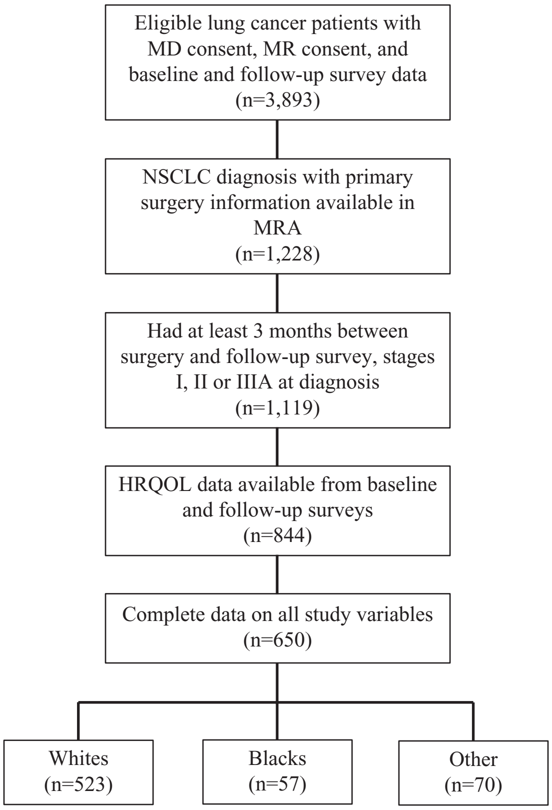

FIGURE 1. Study cohort, cancer care outcomes research and surveillance cohort selection. HRQOL, health-related quality of life; MD, medical doctor; MR, medical record; MRA, medical record abstraction; NSCLC, Non–small-cell lung cancer.