Socioeconomic Status Is Associated with Depressive Severity Among Patients with Advanced Non–Small-Cell Lung Cancer: Treatment Setting and Minority Status Do Not Make a Difference

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Introduction: Non–small-cell lung cancer (NSCLC) is the leading cause of cancer-related morbidity and mortality. Unfortunately, patients with NSCLC have relatively poor survival rates compared with patients diagnosed with most other types of cancer. Accordingly, managing physical and mental health symptoms are important treatment goals. In the current investigation, we sought to determine whether individual socioeconomic status (SES; as indexed by level of education), racial/ethnic minority status, and hospital type (public versus tertiary care center) were associated with NSCLC cancer patients' depressive severity. Importantly, we investigated whether NSCLC patients' individual SES was more or less prognostic of their depressive severity compared with minority status and the hospital context where they received treatment.

Methods: Patients scheduled for chemotherapy were assessed for depressed mood by the Beck Depression Inventory-II (BDI-II). Data were collected at baseline and at approximately 6, 12, and 18 weeks.

Results: NSCLC patients with less education had more depressive severity than those with more education. Treatment setting and minority status were not associated with depressive severity. The interaction between education level and treatment setting predicting depressive severity was not significant, suggesting that the association between education level and depressive severity did not differ by treatment setting.

Conclusion: Our study brings heightened awareness to the substantial, persistent SES differences that exist in depressive severity among late-stage NSCLC patients. Furthermore, these findings seem to persist, regardless of minority status and whether the patient is treated at a public hospital or tertiary cancer center.

Key Words: Depression, Quality of life, Socioeconomic status, Non–small-cell lung cancer, Medically underserved.

(*J Thorac Oncol.* 2014;9: 1459–1463)

Health disparities increase with each step down the socioeconomic status (SES) ladder.[1] Whether indexed by education, income, or job status, being low SES is associated with poor health.[1] For most cancers, lower SES individuals are at greater risk for both incidence and mortality compared with those who are higher SES.[2,3] Much less is known about how SES impacts cancer patients' mental and physical well-being.

Non–small-cell lung cancer (NSCLC) is the leading cause of cancer-related morbidity and mortality.[4] Unfortunately, patients with NSCLC have relatively poor survival rates compared with patients diagnosed with most other types of cancer. Accordingly, managing physical and mental health symptoms are important treatment goals.[5] To improve NSCLC patients' quality of life (QOL), it is imperative to identify factors associated with physical and mental well-being.

Recently, we demonstrated that lower SES individuals (as indexed by level of education) with advanced NSCLC had poorer physical well-being (i.e., pain, fatigue, disturbed sleep, shortness of breath, and drowsiness) during chemotherapy compared with those who were higher SES.[5] Likewise, NSCLC patients who were treated at public hospitals with good performance status were more likely to experience these symptoms compared with those treated at a tertiary care centers.[5] Importantly, these findings persisted over 15 weeks of therapy.[5]

In the current investigation, we sought to determine whether SES, racial and ethnic minority status, and hospital type (pubic versus tertiary care center) were associated with NSCLC cancer patients' depressive severity over 15 weeks of therapy. Depression severity is an important aspect of mental well-being and one of the strongest predictors of QOL for cancer patients.[6] Cancer patients' depression is also a major contributor to their close family members' well-being.[7] Importantly, we investigated whether NSCLC patients' individual SES was more or less prognostic of their depressive severity compared

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Disclosure: The authors declare no conflict of interest.

This work was supported by the National Cancer Institute at The National Institutes of Health (grant number NIH/NCI R01 CA026582 to Charles S. Cleeland), the Hawn Foundation, and the University Cancer Foundation. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Cancer Institute or the National Institutes of Health.

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10.1097/JTO.0000000000000284

ISSN: 1556-0864/14/0910-1459

with the hospital context where they received treatment and their status as a racial or ethnic minority.

STUDY PARTICIPANTS

Advanced stage (IIIB–IV) NSCLC patients who were scheduled for chemotherapy were recruited for this study between January 2004 and December 2008. They were recruited from thoracic medical oncology clinics of a tertiary cancer center in Houston, Texas, and from the general oncology clinics of three public hospitals (two in Houston, one in Miami, Florida) providing care for medically underserved (noninsured/underinsured and/or low-income) patients.[8] The study was approved by the institutional review boards of the participating institutions. All patients gave informed consent to participate. The study time period was limited to the first 18 weeks of treatment based on a standard chemotherapy protocol that included six, 3-week cycles of treatment.

Of 234 eligible patients approached to participate in the study, 189 consented to participate. Four withdrew before baseline assessment, such that 185 were included in the final analysis. Of these, 102 were recruited from the tertiary cancer center and 83 from the public hospitals. All 185 patients contributed data at baseline, 140 at 6 weeks, 107 at 12 weeks, and 79 at 18 weeks from the start of the study (Fig. 1).

MEASURES

The Beck Depression Inventory II (BDI-II)[9] is a widely used instrument for measuring the intensity of depression. It contains 21 items that assess various aspects of depression. Each item is rated on a 4-point scale, resulting in a maximum attainable score of 63. A higher total score indicates more-severe depressive severity. The BDI-II has high clinical sensitivity with a reliability coefficient of 0.92 and predictive validity of 0.91.[9] Assessments were obtained at baseline and at 6, 12, and 18 weeks from initiation of chemotherapy using the BDI-II's standard cut points.[9] The BDI-II has been found to be a reliable measure of depression across race/ethnicity and gender.[10,11]

Comorbidities

The Charlson index is the most widely used comorbidity index. Originally developed for predicting mortality in breast cancer patients, it has now been widely used with both cancer and noncancer populations.[12]

Demographic and Clinical Variables

Participants answered questions about their age, race, highest level of education, marital status, and gender. Following participants' authorization, electronic medical records were reviewed to obtain initial treatment date.

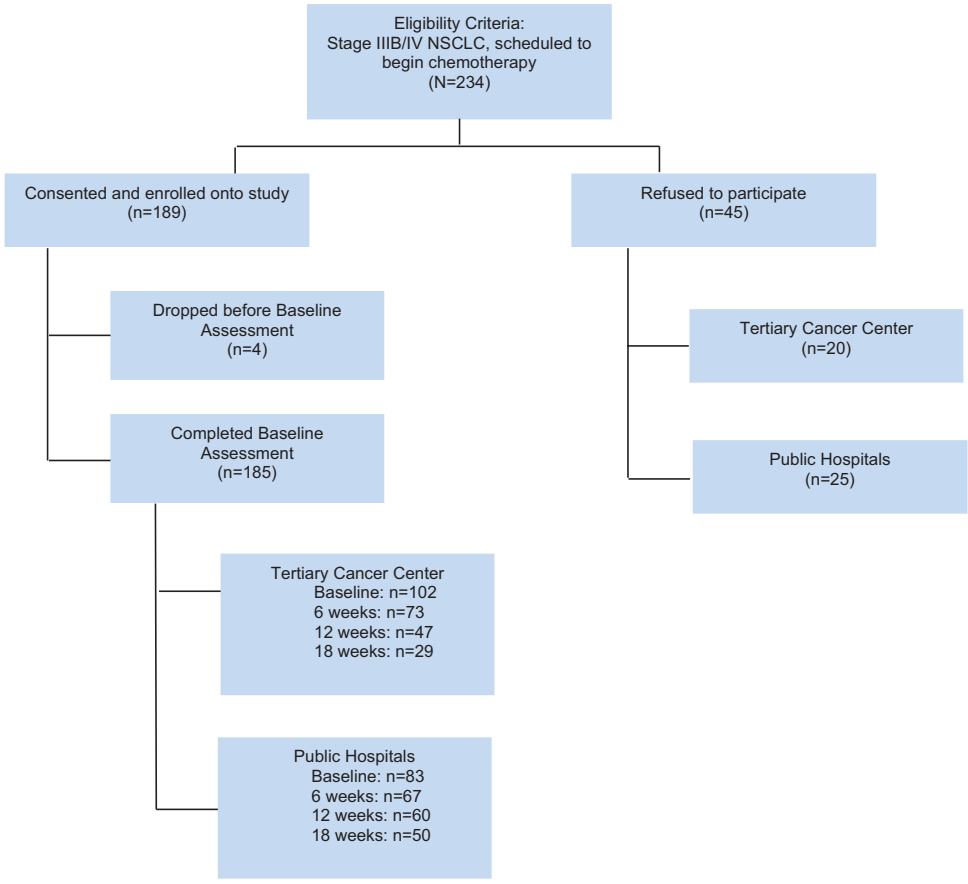

FIGURE 1. Flow of participants through the study. NSCLC, Non–small-cell lung cancer.