

Association Between Socioeconomic Status and Tumor Grade Among Black Men with Prostate Cancer

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Abstract: Background: Prostate cancer affects black men disproportionately. Black men have an increased incidence of prostate cancer diagnoses at earlier ages and higher grade as indicated by Gleason score, compared to other races. This study investigates the impact of socioeconomic status (SES) on prostate cancer tumor grade among black men.

Methods: Black men with a prostate cancer diagnosis during 1973–2011 were examined using individual-level data from the SEER NLMS database. Logistic regression model estimated the likelihood of receiving a diagnosis of high versus low grade prostate cancer based on self-reported SES status at the time of diagnosis.

Results: Men who completed high school only were statistically significantly more likely to have a higher prostate cancer grade than those with a bachelor's degree or higher. However, there was no dose-response effect across educational strata. Retirees were 30% less likely to have higher grade tumors compared to those who were employed.

Conclusions: SES differences among black men did not fully explain the high grade of prostate cancer. Further research is needed on the biology of the disease and to assess access to medical care and prostate health education, discrimination, stress exposures, and social norms that might contribute to the aggressiveness of prostate cancer among black men.

Keywords: SEER NLMS ■ Socioeconomic status ■ Prostate cancer ■ Black men ■ Aggressiveness ■ Tumor grade

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INTRODUCTION

Prostate cancer is the most prevalent non-skin cancer among men in the United States and second only to lung cancer for annual cancer deaths among men.¹ For reasons that are not clear, black men have a 67%

higher risk of developing prostate cancer than their white counterparts, which has increased over recent years.² Mortality risk among black men is almost 2.3 times that of whites.²

Although most tumors of the prostate are slow growing and may not affect the life expectancy of the man diagnosed, some grow aggressively. This aggressiveness is more common among black men compared to men of other races.³ Prostate cancer tumor grade signifies the extent of tumor differentiation, with poorly differentiated tumor often behaving most aggressively. Grade is therefore a predictor of prostate cancer outcome.⁴

The purpose of this study is to investigate the relationship between socioeconomic status (SES) and tumor grade among black men with prostate cancer. Previous research has documented a higher prostate cancer burden among black males compared to all other races. However, few studies have examined the relationship between SES and prostate cancer across the total population. Clegg et al. (2009) examined the relationship between self-reported SES and cancer (including prostate cancer) on a national level but focused on stage.⁵ No study was found that focused on prostate cancer grade and SES among black men. This study used the SEER NLMS database to examine the relationship between self-reported SES and prostate cancer grade among black men. We hypothesized that lower SES is associated with higher prostate cancer grade among black men.

METHODS

Study population

Black men in the National Longitudinal Mortality Study (NLMS) database were matched to prostate cancer cases in the National Cancer Institute's Surveillance, Epidemiology, and End Results (NCI SEER) population-based cancer database to create a linked dataset. Together, the linked databases allow researchers to examine SES differences in prostate cancer grade. SES that was self-reported information from the Current Population Survey (CPS), 1973–2011. Prostate cancer grade was

Table 1. Descriptive statistics, SEER NLMS, prostate cancer diagnosis years 1988–2011.

Variable	High grade (n, %)	Low grade (n, %)	Total (n, %)
Race, Black (n=945)	339 (36.0)	606 (64.0)	945 (100.0)
Age			
75+	75 (45.5)	90 (54.5)	165 (17.0)
65–74	106 (31.0)	235 (69.0)	341 (36.0)
55–64	125 (38.0)	203 (62.0)	328 (35.0)
<55	33 (30.0)	78 (70.0)	111 (12.0)
Marital status			
Married	234 (36.0)	412 (64.0)	646 (69.0)
Never married	40 (32.0)	84 (68.0)	124 (12.0)
Separated, Divorced, Widowed	65 (37.0)	110 (63.0)	175 (19.0)
Education			
Less than HS	110 (34.0)	216 (66.0)	326 (34.5)
Completed HS	119 (42.0)	165 (58.0)	284 (30.1)
Some college	70 (36.0)	123 (64.0)	193 (20.4)
Bachelor's or higher	40 (28.0)	102 (72.0)	142 (15.0)
Adjusted income			
≥\$40,000	108 (33.0)	215 (67.0)	323 (32.0)
\$16,000 – \$39,999	141 (37.0)	240 (63.0)	381 (42.0)
0 – \$15,999	90 (37.0)	151 (63.0)	241 (26.0)
Employment			
Employed	208 (37.0)	358 (63.0)	566 (61.0)
Unemployed	21 (45.0)	26 (55.0)	47 (6.0)
Retired	110 (33.0)	222 (67.0)	332 (33.0)

Note: the percentages for low and high grade are "row" percentages and the total percentages are "column" percentages.

from SEER data extracted from medical records for diagnosis years 1988–2011.

Data sources

The NCI SEER Program provides clinical data and tumor characteristics collected from population-based cancer registries. The 17 selected SEER areas and data years for this study are Connecticut, Detroit, Hawaii, San Francisco, New Mexico, Utah, Iowa (1973–2011); Seattle-Puget Sound (1974–2011); Atlanta (1975–2011); Los Angeles, San Jose, Rural Georgia (1992–2011); and Kentucky, Greater California, Louisiana, New Jersey and Greater Georgia (2000–2011).

The NLMS provides information on the demographic and SES characteristics of a weighted sample in the U.S. It is administered by the Census Bureau and consists of surveys collecting socio-demographic data

through the CPS and Annual Social and Economic Supplements (ASEC).

Inclusion/exclusion criteria

The present study included 38 CPS/ASEC cohorts matched to 17 SEER registries. The SEER NLMS study participants were black men with microscopically confirmed diagnoses of prostate cancer. Cases diagnosed before 1988 were excluded because they preceded development of the new specific codes for grades developed by NCI SEER. Of the 9113 prostate cancer cases in the SEER NLMS database, 1014 black men were eligible for this study. Data was then restricted to participants with completed SES data; no survey/supplement responses were incomplete. After exclusions, 945 cases were available for analysis of prostate cancer grade. Statistical power calculation showed we had adequate sample size at a power of 80%.

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