Racial Differences in the Surgical Care of Medicare Beneficiaries With Localized Prostate Cancer

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**IMPORTANCE** There is extensive evidence suggesting that black men with localized prostate cancer (PCa) have worse cancer-specific mortality compared with their non-Hispanic white counterparts.

**OBJECTIVE** To evaluate racial disparities in the use, quality of care, and outcomes of radical prostatectomy (RP) in elderly men (≥ 65 years) with nonmetastatic PCa.

**DESIGN, SETTING, AND PARTICIPANTS** This retrospective analysis of outcomes stratified according to race (black vs non-Hispanic white) included 2020 elderly black patients (7.6%) and 24 462 elderly non-Hispanic white patients (92.4%) with localized PCa who underwent RP within the first year of PCa diagnosis in the Surveillance, Epidemiology, and End Results (SEER)-Medicare database between 1992 and 2009. The study was performed in 2014.

**MAIN OUTCOMES AND MEASURES** Process of care (ie, time to treatment, lymph node dissection), as well as outcome measures (ie, complications, emergency department visits, readmissions, PCa-specific and all-cause mortality, costs) were evaluated using Cox proportional hazards regression. Multivariable conditional logistic regression and quantile regression were used to study the association of racial disparities with process of care and outcome measures.

**RESULTS** The proportion of black patients with localized prostate cancer who underwent RP within 90 days was 59.4% vs 69.5% of non-Hispanic white patients ($P < .001$). In quantile regression of the top 50% of patients, blacks had a 7-day treatment delay compared with non-Hispanic whites ($P < .001$). Black patients were less likely to undergo lymph node dissection (odds ratio [OR], 0.76 [95% CI, 0.66-0.80]; $P < .001$) but had higher odds of postoperative visits to the emergency department (within 30 days: OR, 1.48 [95% CI, 1.18-1.86]); after 30 days or more (OR, 1.45 [95% CI, 1.19-1.76]) and readmissions (within 30 days: OR, 1.28 [95% CI, 1.02-1.61]); ≥ 30 days (OR, 1.27 [95% CI, 1.07-1.51]) compared with non-Hispanic whites. The surgical treatment of black patients was associated with a higher incremental annual cost (the top 50% of blacks spent $1185.50 (95% CI , $804.85-$1566.10; $P < .001$) more than the top 50% of non-Hispanic whites). There was no difference in PCa-specific mortality ($P = .16$) or all-cause mortality ($P = .64$) between black and non-Hispanic white men.

**CONCLUSIONS AND RELEVANCE** Blacks treated with RP for localized PCa are more likely to experience adverse events and incur higher costs compared with non-Hispanic white men; however, this does not translate into a difference in PCa-specific or all-cause mortality.

Published online October 22, 2015.

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Prostate cancer (PCa) is the most frequently diagnosed noncutaneous cancer in the male US population, with an estimated 233,000 new cases in 2014. The treatment of PCa is driven by many factors, including the severity of disease at presentation. Definitive therapy for localized PCa with curative intent is performed with radical prostatectomy (RP), radiotherapy (RT), or combinations thereof, and has shown to decrease PCa-specific mortality and improve overall survival, especially in patients with intermediate-to-high risk disease.

Compelling data suggest that race and ethnicity strongly correlate with survival following a PCa diagnosis. Godley et al found that blacks experience higher PCa-specific mortality compared with whites, and this gap may be widening. The underlying reasons are unclear but likely result from complex biological, cultural, and sociodemographic differences. Nonetheless, there is evidence for a substantial disparity in the quality of received care. Some studies demonstrated substantial variability in treatment selection of racial and ethnic minorities, as well as inconsistency in outcomes of treatment. Underwood et al showed that blacks and Hispanics were less likely to receive definitive therapy than whites, which has prompted investigators to hypothesize that a large part of care disparities stem from lower rates of definitive treatment for blacks.

Based on these considerations, we assessed the effect of race on quality of care and survival of men receiving RP as definitive treatment of localized PCa. By restricting our cohort to a more homogeneous group of surgical candidates enrolled in Medicare, we sought to attenuate the effect of unmeasured confounders on the outcomes of treatment for PCa.

**Methods**

**Population Source**

The current study used the most recent version of the Surveillance, Epidemiology, and End Results (SEER)-Medicare linked database. The SEER program provides information on cancer incidence and population data associated by age, sex, race, clinical demographics, tumor characteristics, primary treatment, and cause of death. A signed research data agreement is required to access these data. Linkage with Medicare claims for covered health care services provides data from the time of a person’s Medicare eligibility until death. The SEER database covers approximately 28% of the US population. For linkage, approximately 93% of men 65 years or older in the SEER files were matched to the Medicare enrollment file.

An institutional review board waiver was obtained from Partners Healthcare prior to conducting this study, in accordance with institutional regulation when dealing with deidentified administrative data.

**Study Cohort**

The exclusion process for our cohort is illustrated in Figure 1. After selection, 26,482 men with localized PCa who underwent RP within the first year of PCa diagnosis remained for final analyses.

Definitive treatment within 12 months of diagnosis was assessed by searching inpatient claims from the Medicare Provider Analysis and Review file, based on International Classi-
Racial Differences in the Surgical Care of Localized Prostate Cancer

Covariates
For each patient, age, year of diagnosis, population density, marital status, 2000 US Census tract percentage with a 4-year college education, 2000 US Census tract annual median income, and region were assigned. Age was categorized into 4 groupings (<75, 75-79, 80-85, and >85 years). The Charlson comorbidity index (CCI) was derived from the Medicare claims 1 year prior to PCa diagnosis, using a previously validated algorithm. In addition, Gleason score and American Joint Committee on Cancer (AJCC) clinical stage were available. Prior to 2003, Gleason grades of 2 to 4, 5 to 7, and 8 to 10 corresponded to well, moderately, and poorly differentiated disease, respectively, whereas thereafter Gleason grades of 2 to 4, 5 to 6, and 7 to 10 corresponded to well, moderately, and poorly differentiated PCa, respectively. Clinical extension information provided by SEER was used to determine cancer stage (T1, T2, T3). Finally, patients were stratified into 3 risk groups for sensitivity analyses. Risk group 1 consisted of localized (T1/T2) low-risk disease (well and moderately differentiated), risk group 2 consisted of localized (T1/T2) high-risk disease (poorly differentiated), and risk group 3 consisted of locally advanced (T3) disease of any grade.

Process of Care and Outcome Measures
Relying on previous methodology, process of care measures included treatment type and time to treatment, as well as the use of additional cancer therapies (eg, RT, androgen deprivation therapy [ADT]). Delayed treatment was defined as an RP more than 3 months after PCa diagnosis. In addition, lymph node dissection (LND) was identified as a quality-of-care measure. Sensitivity analyses restricted to individuals with intermediate- and high-risk disease were also performed.

Outcome measures consisted of complications, emergency department (ED) visits, readmissions, and mortality within 30 days of surgery and thereafter (>30 days). We identified the following groups of complications: cardiac, respiratory, vascular, wound/bleeding, genitourinary, bowel, miscellaneous medical, and miscellaneous surgical.

Long-term outcome measures consisted of PCa-specific and all-cause mortality. Survival was determined by Medicare vital statistics as well as SEER linkage to death certificates (National Death Index). The effect of comorbidities on survival was estimated with Cox proportional hazards modeling, and the weights for the individual comorbidity conditions were calculated by efficient estimates of the condition indicators.

Statistical Analyses
The primary variable of interest in all models was race (black vs non-Hispanic white). First, we analyzed the association between race and outcomes (complications, short-term mortality, number of readmissions and ED visits, PCa-specific mortality, and all-cause mortality). Summary statistics were constructed using frequencies and proportions for categorical variables, as well as medians and interquartile ranges (IQRs) for continuous variables. Categorical values were compared using χ² test, and continuous variables were compared with the Wilcoxon Rank sum test.

Cox proportional hazard models were used to assess PCa-specific mortality and all-cause mortality outcomes. Models were adjusted for age, marital status, TNM stage, grade, CCI, US Census tract income and education quartile, and urban vs rural region of residence. Additional sensitivity analyses restricted to the first half of the study (1992-2000) were conducted to rule out that a lack of difference in survival was not simply a function of short follow-up.

To account for variation in treatment patterns between local treatment areas, we adjusted for health service areas (HSA). In particular, we assumed that the baseline hazard could be different across HSA and fitted a Cox model stratified by HSA (equivalent to treating HSA as a fixed effect). Similarly, logistic regression models that accounted for HSA as a stratification variable and that were adjusted for all Table 1 covariates were used to model if race was a predictor for delayed treatment, additional cancer therapy, LND, any complications, readmission, or ED visits. Conditional logistic regression was used to eliminate the HSA stratification effect in the model. The parameters from the stratified Cox model and the conditional logistic regression model can be considered subject-specific parameters; as such, the estimates presented can be interpreted as hazard ratios (or odds ratios [ORs]) of a patient dying, for a person of one race compared with a person identical on all other possible covariates except for race.

To ensure that the disparities in outcomes were not readily explained by surgeon characteristics, we compared surgeon caseload, experience, and training between blacks and non-Hispanic whites. Physicians were identified in the Medicare Outpatient Statistical Analytical File and National Claims History claims using unique physician identifier numbers as previously described.

Finally, quantile regression was used to determine the effect of race on conditional means of continuous outcomes. Outcomes of interest were time from diagnosis to surgery (in days), time to RT, and annual incremental cost (determined by total health care spending the year after PCa diagnosis minus total health care spending in the year before diagnosis). We conducted sensitivity analyses by constructing weighted Cox proportional hazard models using inverse probabilities of race weights, which give additional weight to minority patients, derived from propensity scores based on the patient, hospital, and surgical characteristics mentioned herein, and found our Cox model results to be consistent.

All statistical testing was 2-sided with a level of significance set at .05. Analyses were performed using SAS statistical software (version 9.3; SAS Institute Inc).

Results
Study Cohort Characteristics
Between January 1992 and December 2009, 26,482 patients who underwent RP for localized PCa and met the inclusion cri-
teria were recorded in SEER. Of these, 2020 (7.6%) were blacks and 24462 (92.4%) were non-Hispanic whites. Baseline characteristics are listed in Table 1. The proportion of blacks undergoing surgery increased from 6.0% to 8.3% between 1992 to 1999 and 2000 to 2009. Blacks were more likely to have more comorbidities (CCI ≥ 2; *P* < .001), to reside in metropolitan areas (90.1% vs 82.3%; *P* < .001), to reside in the South (38.9%), to be single (30.6% vs 13.5%; *P* < .001), to not have a college education (12.8% vs 26.8%; *P* < .001), and to have a lower household income ($34 884 vs $50 662; *P* < .001) than non-Hispanic whites. Lower tumor stage (AJCC stage I-II) was more prevalent in blacks (75.1% vs 68.1%), whereas non-

### Table 1. Descriptive Characteristics of 26,482 Men Undergoing Radical Prostatectomy for Localized Prostate Cancer Within the First Year After Diagnosis

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>No. (%)</th>
<th>Blacks</th>
<th>Non-Hispanic Whites</th>
<th><em>P</em> Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td>26,482 (100)</td>
<td>2020 (7.6)</td>
<td>24,462 (92.4)</td>
<td></td>
</tr>
<tr>
<td>Years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1992-1999</td>
<td>7709 (29.1)</td>
<td>466 (23.1)</td>
<td>7243 (29.6)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>2000-2009</td>
<td>18,773 (70.9)</td>
<td>1554 (76.9)</td>
<td>17,219 (70.4)</td>
<td></td>
</tr>
<tr>
<td>Age at diagnosis, median (IQR), y</td>
<td>69.6 (67.7-72.7)</td>
<td>70.0 (67.9-72.8)</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>Age at diagnosis, y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;75.0</td>
<td>22,980 (86.8)</td>
<td>1785 (87.0)</td>
<td>21,222 (86.8)</td>
<td></td>
</tr>
<tr>
<td>75.0-79.9</td>
<td>2632 (9.9)</td>
<td>185 (9.2)</td>
<td>2447 (10.0)</td>
<td></td>
</tr>
<tr>
<td>80.0-85.0</td>
<td>637 (2.4)</td>
<td>54 (2.7)</td>
<td>583 (2.4)</td>
<td></td>
</tr>
<tr>
<td>&gt;85.0</td>
<td>233 (0.9)</td>
<td>23 (1.1)</td>
<td>210 (0.8)</td>
<td></td>
</tr>
<tr>
<td>Charlson Comorbidity Index</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>21,048 (79.5)</td>
<td>1329 (65.8)</td>
<td>19,719 (80.1)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>4013 (15.2)</td>
<td>448 (22.2)</td>
<td>3565 (14.6)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>≥2</td>
<td>1421 (5.3)</td>
<td>243 (12.0)</td>
<td>1178 (4.8)</td>
<td></td>
</tr>
<tr>
<td>Region</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Midwest</td>
<td>4387 (16.6)</td>
<td>431 (21.3)</td>
<td>3956 (16.1)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Northeast</td>
<td>3297 (12.5)</td>
<td>249 (12.3)</td>
<td>3048 (12.5)</td>
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<tr>
<td>South</td>
<td>5094 (19.2)</td>
<td>785 (38.9)</td>
<td>4309 (17.6)</td>
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<tr>
<td>West</td>
<td>13,704 (51.7)</td>
<td>555 (24.9)</td>
<td>13,149 (53.8)</td>
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<td>Population density</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metropolitan</td>
<td>21,948 (82.9)</td>
<td>1819 (90.1)</td>
<td>20,129 (82.3)</td>
<td>&lt;.001</td>
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<tr>
<td>Nonmetropolitan</td>
<td>4534 (17.1)</td>
<td>201 (9.9)</td>
<td>4333 (17.7)</td>
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<td>Tumor stage</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>1</td>
<td>3295 (12.4)</td>
<td>277 (13.7)</td>
<td>3018 (12.3)</td>
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<tr>
<td>2</td>
<td>14,880 (56.2)</td>
<td>1241 (61.4)</td>
<td>13,639 (55.8)</td>
<td>&lt;.001</td>
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<tr>
<td>3</td>
<td>8307 (31.4)</td>
<td>502 (24.9)</td>
<td>7805 (31.9)</td>
<td></td>
</tr>
<tr>
<td>AJCC tumor grade</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>432 (1.6)</td>
<td>26 (1.3)</td>
<td>406 (1.7)</td>
<td>.12</td>
</tr>
<tr>
<td>2</td>
<td>14,091 (53.2)</td>
<td>1044 (51.7)</td>
<td>13,047 (53.3)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>11,959 (45.2)</td>
<td>950 (47.0)</td>
<td>11,009 (45.0)</td>
<td></td>
</tr>
<tr>
<td>Risk group*</td>
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<td></td>
</tr>
<tr>
<td>Low</td>
<td>14,523 (54.8)</td>
<td>1070 (53.0)</td>
<td>13,453 (55.0)</td>
<td>.08</td>
</tr>
<tr>
<td>High</td>
<td>11,959 (45.2)</td>
<td>950 (47.0)</td>
<td>11,009 (45.0)</td>
<td></td>
</tr>
<tr>
<td>Marital status</td>
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<tr>
<td>Married</td>
<td>21,320 (80.5)</td>
<td>1282 (63.5)</td>
<td>20,038 (81.9)</td>
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<tr>
<td>Unmarried</td>
<td>3930 (14.8)</td>
<td>619 (30.6)</td>
<td>3311 (13.5)</td>
<td>&lt;.001</td>
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<tr>
<td>Unknown</td>
<td>1232 (4.7)</td>
<td>119 (5.9)</td>
<td>1113 (4.6)</td>
<td></td>
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<tr>
<td>College education, median (IQR), %</td>
<td>12.8 (8.0-24.0)</td>
<td>26.8 (15.3-44.4)</td>
<td>&lt;.001</td>
<td></td>
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<tr>
<td>Household income, median (IQR), $b</td>
<td>34,884 (25,709-46,934)</td>
<td>50,662 (38,364-68,833)</td>
<td>&lt;.001</td>
<td></td>
</tr>
</tbody>
</table>

Abbreviations: AJCC, American Joint Committee on Cancer; IQR, interquartile range.

* Prior to 2003 Gleason grades of 2 to 4, 5 to 7, and 8 to 10 corresponded to well-differentiated (AJCC grade 1), moderately (AJCC grade 2) differentiated, and poorly differentiated disease (AJCC grade 3), respectively. Thereafter, Gleason grades of 2 to 4, 5 to 6, and 7 to 10 corresponded to well-differentiated, moderately differentiated, and poorly differentiated PCa, respectively. Well and moderately differentiated cancers constitute the low-risk group.

*b Percentage with a 4-year college education and household income in 2000 US Census tract of residence.
Hispanic whites had a higher percentage of stage III disease (31.9% vs 24.9%; \( P < .001 \)). There was no significant difference in surgeon characteristics between the 2 groups.

Treatment and Quality Of Care

On average, blacks experienced a longer treatment delay than non-Hispanic whites (mean 79 vs 71 days; \( P = .001 \)) (eTable 1 in the Supplement). In multivariate analyses, blacks were less likely to receive RP within 3 months of diagnosis (OR, 0.65 [95% CI, 0.59-0.71]; \( P < .001 \)) (Table 2), and the top 50% had an absolute treatment delay of 7 days (95% confidence limit [CL], 3.64-10.13) (eTable 2 in the Supplement). This difference persisted at 6 and 9 months, where 18.0 and 12.3% of blacks vs 11.0 and 7.0% of non-Hispanic whites had not had surgery, respectively (\( P < .001 \)). Overall, 57.7% of blacks underwent surgery without further adjuvant therapy compared with 61.3% of non-Hispanic whites (\( P = .92 \) [95% CI, 0.67-1.05]; \( P = .33 \), respectively; data not shown).

In univariate analyses, black race was correlated with more postoperative complications, ED visits, readmissions, mortality and less transfusions (\( P < .05 \) for all comparisons) (eTable 1 in the Supplement). In multivariable analyses, blacks had increased odds of ED visits within 30 days and more than 30 days following RP (OR, 1.48 [95% CI, 1.18-1.86] and OR, 1.45 [95% CI, 1.19-1.80]) and readmissions within 30 days and more than 30 days (OR, 1.28 [95% CI, 1.02-1.60] and OR, 1.27 [95% CI, 1.07-1.51]) compared with non-Hispanic whites (Table 2, Figure 2).

With regard to additional cancer therapies, we recorded a significantly shorter period from PCA diagnosis to RT after RP for black men in the top 50% of our cohort. Specifically, blacks experienced RT about 95 days earlier compared with non-Hispanic whites (95% CL, –149 to –42 days; \( P = .001 \)) (eTable 2 in the Supplement). They were also more likely to receive ADT (\( P = .001 \)). In addition, once secondary cancer treatment (ADT, RT) was administered, time to treatment was significantly shorter than in non-Hispanic whites (eTable 1 in the Supplement).

Median total calculated costs were $13 015 (IQR, $8279-$19 314) for blacks compared with $15 758 (IQR, $8439-$17 080) for non-Hispanic whites. The surgical treatment of blacks was associated with higher incremental annual cost, with the top 50% spending $1185.50 more compared with non-Hispanic whites (95% CI, $804.85-$1566.10; \( P < .001 \)) (eTable 2 in the Supplement).

Overall and PCa-Specific Mortality

With a mean follow-up of 81.4 months (IQR, 43.1-106.0 months) compared with 93.3 months (IQR, 49.2-127.4 months), unadjusted all-cause mortality, but not PCA-specific mortality, was significantly higher for blacks compared with non-Hispanic whites (HR, 1.10 [95% CI, 1.02-1.18]; \( P = .02 \); data not shown), respectively. However, with adjustment for HSA, there was no difference in all-cause mortality (HR, 1.07 [95% CI, 0.97-1.17]; \( P = .16 \)) and PCa-specific mortality (HR, 1.07 [95% CI, 0.80-1.40]; \( P = .64 \)) (Table 3). In sensitivity analyses restricting the cohort to patients treated between 1992 and 1999, with a median follow-up of 150 months, race was not an independent predictor for all-cause mortality (HR, 1.02 [95% CI, 0.90-1.18]) and HR, 1.08 [95% CI, 0.70-1.64]) for both comparisons. With regard to non-PCa-specific mortality, race was not a significant predictor (HR, 0.83 [95% CI, 0.66-1.07]) (eTable 3).
Discussion

There is abundant controversy vis-à-vis the gap in PCa outcomes between blacks and non-Hispanic whites. While population-based data suggest higher PCa-specific mortality across all tumor stages for blacks,20 reports originating from equal-access health care delivery systems have shown equivalent survival across all races after adjusting for stage at diagnosis and treatment.29 Consequently, Underwood et al10 speculated that the survival disparities originate from the receipt (or lack) of definitive treatment in blacks and Hispanics. Over the past decade, disparities in definitive treatment decreased significantly in Hispanics, whereas they have persisted in blacks.30 However, there is also biological evidence that PCa in blacks is more aggressive than in non-Hispanic whites, thus providing an alternate explanation for the differences. Herein, we investigate disparities in elderly black vs elderly non-Hispanic white men who have chosen to undergo RP as definitive treatment for localized PCa.

Our study carries several major findings. First, we noticed a significant gap in of RP utilization between blacks and non-Hispanic whites. As postulated by Underwood et al10 and Barocas et al,23 this shortcoming is likely responsible for an important share of disparities in PCa survival between blacks and non-Hispanic whites. Most important, as derived from trend analyses, our findings suggest that this gap has not significantly improved over time, which raises concerns that this problem is not being adequately addressed.

Second, we identified statistically significant differences in the quality of care received by blacks relative to non-Hispanic whites. For example, we found that blacks were less likely to undergo pelvic LND at the time of surgery. Although LND may be safely avoided in the context of low-risk disease, there are clear recommendations mandating a template lymphadenectomy for patients with a predicted probability of lymph node invasion greater than 2%,32,33 which translates into the need for LND in most patients with intermediate- and high-risk disease. In adjusted analyses of these subsets of patients, the disparities persisted. However, when we accounted for regional patterns of care by adjusting for HSA, blacks with intermediate- and high-risk disease were just as likely to undergo LND. Such findings emphasize that the geographic variation in quality of care is tightly linked to racial disparities and may thus account for a significant proportion of the differences.34 Moreover, we found a difference in the time from diagnosis to treatment between blacks and non-Hispanic whites. While the difference was clinically small (8 days; \( P = .001 \)), this may be most significant in those with locally advanced disease. Indeed, O’Brien et al35 demonstrated that treatment delay of more than 6 months led to pathological upgrading, worse RP outcomes, and higher rate of biochemical recurrence in localized PCa. Finally, we showed that racial disparities in preoperative and perioperative care persist in surgical postoperative outcomes. In our study, blacks had higher rates of ED visits and readmissions. The differences in comorbidities may ascertain for higher postoperative health care utilization rates among blacks, as described previously.20,31,36 However, our findings are significant because they account for measured confounders with multivariable adjustment, as well as other unmeasured confounders, given that individuals deemed “unfit” for surgery were excluded. In sensitivity analyses, we could not find significant differences in surgeon caseload, experience, or training between blacks and non-Hispanic whites. Therefore, the gap in perioperative outcomes could not be attributed to differences in clinician characteristics.

In addition to poorer quality of care and postoperative outcomes, our study finds that the cost of care for blacks treated with RP is higher than for non-Hispanic whites. Because modest projections suggest that cost for PCa care will reach $18 billion by the end of this decade,37 important work needs to be done to optimize and improve the value of PCa treatment paradigms. Much of the burden in increased costs has been attributed to the adoption of new technologies, like robotic sur-

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Table 3. Multivariable Cox Regression Analyses Testing Overall and PCa-Specific Survival in 26 482 Men Undergoing Radical Prostatectomy for Localized PCa Within the First Year of Diagnosis*

<table>
<thead>
<tr>
<th>Mortality</th>
<th>Blacks vs Non-Hispanic Whites</th>
<th>OR/HR (95% CI)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic whites</td>
<td>1 [Reference]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blacks</td>
<td>1.07 (0.97-1.17)</td>
<td>.16</td>
<td></td>
</tr>
<tr>
<td>PCa-specific</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic whites</td>
<td>1 [Reference]</td>
<td></td>
<td>.64</td>
</tr>
<tr>
<td>Blacks</td>
<td>1.07 (0.80-1.42)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Abbreviations: HR, hazard ratio; PCa, prostate cancer.

*Models were adjusted for age, marital status, TNM stage, grade, Charlson Comorbidity Index, US Census tract income and education quartile, and urban vs rural region of residence.
surgery or proton-beam therapy. Although access to these technologies might be improving, the data show clearly that blacks are in fact still discriminated against in the use of such new technologies. Therefore, it is unlikely that such a phenomenon is responsible for the increased financial burden of RP in blacks. A careful examination of the data would suggest that the more prevalent use of BT and ADT in blacks may be partly responsible. Moreover, indicators of poorer quality of care, like increased rates of ED visits and readmissions in blacks, may also ascertain for the increased expenditures.

The next major finding of our study shows that, despite important constellations of poor quality of care for blacks undergoing RP, we did not detect significant differences in overall and cancer-specific survival. This is a remarkable shift from the generally accepted paradigm of worse PCa survival in blacks. However, most studies supporting these claims were unable to adjust for significant predictors of survival, and were subject to many unmeasured confounders that may have affected oncological outcomes. Indeed, by excluding men who refused or were not offered surgical treatment for PCa, we selected a cohort of individuals of black men who may be more directly comparable with non-Hispanic whites than in previous studies because they were deemed “fit” for surgery. In those patients who make it to the operating table, despite poorer surgical quality of care, their survival rates were equivalent. To account for the relatively short follow-up (7.6 years), we performed sensitivity analyses restricting the cohort to patients diagnosed between 1992 and 1999 (mean follow-up, 12.5 years); our findings were similar with regard to overall ($P = .78$) and PCa-specific mortality ($P = .77$), thus indicating that even in earlier years, no significant disparity in long-term oncological outcomes was detected in this subset of patients. Finally, we examined the regional variation in mortality within our cohort. Although worse overall survival for blacks was recorded in the South (OR, 1.26 [95% CI, 1.06-1.50]; data not shown), no difference was found between regions with regard to PCa-specific mortality. The difference in overall mortality shown herein is consistent with previous evidence; however, the lack of regional variation with regard to PCa-specific mortality further reinforces our findings. A possible interpretation of our findings is that the biological differences in tumor aggressiveness among blacks may have been exaggerated, and that the perceived gap in survival is a result of lack of access or cultural perceptions with regard to surgical care for PCa or other factors that differentiate who makes it to the operating table.

Despite its strengths, our study has limitations, which are inherent to retrospective, observational studies relying on SEER-Medicare data. Several key unmeasured confounders are not captured in administrative claims and may cause an underestimation of the severity of comorbidities. While blacks had less severe disease characteristics than non-Hispanic whites, the exclusion of patients who refused or were not offered treatment may have introduced a bias by selecting only the healthiest blacks for surgery. Although evidence for clinician-specific screening and treatment recommendation disparities exist in PCa, this issue was outside the scope of our study. However, the contingent clinician-specific selection bias would lead to selection of surgical patients with favorable unmeasured disease characteristics, such as tumor volume, prostate-specific antigen, and number of positive biopsy cores. The lack of such preoperative characteristics may impede primary and secondary treatment choices after biochemical recurrence. While our analyses adjusted for all available socioeconomic confounders, unmeasured sociodemographic variables other than race may explain the observed differences between blacks and non-Hispanic whites. It is important to consider that our study comprised only traditional Medicare enrollees 65 years or older, thus limiting the general application of our findings. Specifically, we acknowledge that most men undergoing RP are younger and hold private insurance. Thus, our findings may not be applicable to the general population of men undergoing RP.

Conclusions

We provide robust evidence for the existence of a substantial difference in the quality of surgical care of PCa in blacks. Because the unfavorable quality of care did not translate into worse overall and cancer-specific survival in our sample, the commonly perceived detrimental survival in black patients with PCa may be the sequela of barriers and selection bias in definitive treatment. Public and professional awareness needs to be raised to address these concerning issues and identify their underlying causes.

ARTICLE INFORMATION

Accepted for Publication: July 27, 2015.

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The Meaning of Race in Prostate Cancer Treatment

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In this issue of JAMA Oncology, Schmid and colleagues1 publish a study comparing outcomes from a large, population-based cohort of black and white American men with localized prostate cancer. They use National Cancer Institute (NCI) Surveillance, Epidemiology, and End Results Program (SEER) data linked to Medicare billing records. Those studied are all Medicare recipients. The findings say a lot about racial health inequalities in the United States and show where efforts should be focused if we are to overcome these disparities. Many of the lessons of this study are applicable to medical care of the American population in general and not just the care of men with prostate cancer.

In this population-based study, black men undergoing radical prostatectomy as definitive treatment tended to have longer waits for surgery, were less likely to undergo lymph node dissection, and were more likely to experience postoperative complications, have subsequent emergency department visits and readmission to hospital. In short, the study shows that black men were less likely to get high-quality care compared with white men. Interestingly, despite the tendency to get inferior quality care, there were no racial differences in prostate-cancer-specific mortality or all-cause mortality.

In many respects, finding racial inequities in quality of care is not a new finding. Indeed, in the 1980s and 1990s, the NCI Black-White Study documented it for a number of cancers, time and time again.2 In the field of prostate cancer, several patterns of care studies have revealed racial differences in receipt of treatment and especially surgical care.3

Many have assumed these differences in patterns of treatment are due to a higher proportion of blacks lacking health insurance and lacking access to care. Indeed, the influences of socioeconomic status on health outcomes are numerous and varied.4 Compared with white college graduates, less-educated whites are more likely to have chronic diseases, such as hypertension, diabetes mellitus, and some cancers. These are powerful comorbid diseases often complicating and interfering with cancer treatment. Impoverished persons of all races are more prone to logistical challenges in getting care and are often less medically sophisticated. In breast cancer, there are even data to suggest that low socioeconomic status is correlated with more aggressive tumor characteristics.5

The black patients in this study have insurance and access to care and were deemed healthy enough for surgery, but there was still a disparity in quality of that care.

There is literature to suggest that blacks with breast and prostate cancer tend to have more aggressive disease. Some attribute the worse outcomes and higher death rate among blacks, at least partially, to this. A belief in race-based differences in disease led some well-meaning people to push for passage of the NIH Revitalization Act of 1993. This federal law requires performance of subset analysis by race on results of all NIH-sponsored phase 3 clinical trials.6 The study of Schmid and colleagues1 has equal outcomes. It is hard evidence that the biology of the prostate does not differ in this group of black and white men with localized disease. This result pushes us to focus on the true efficacy of treatments in all cancers and the racial disparities in their receipt.

What is the true significance of race in health care? The anthropology community is adamant that race is not a biological categorization. It is a sociopolitical categorization. Race as used in US government health statistics and clinical trial analyses is defined by the US Office of Management and Budget (OMB).6 The US OMB also says the definitions are sociopolitical and not based in biology. Race can be roughly parallel with an area of geographic origin. While the argument continues about what race means in terms of prostate cancer risk, it is more appropriate to say that prostate incidence rates are higher among men of African origin and not use the phrase “black race.” The increase in incidence may be due to genetic or environmental factors or both.

This study1 documents clear evidence that quality of care differs by race. Racial differences in comorbid disease, not seen in this study, may also be the cause of some of the disparities in outcome. However, it cannot account for the fact that black...