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Racial Variation in Prostate Cancer Upgrading and Upstaging Among Men with Low-risk Clinical Characteristics

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Abstract

Background: African American (AA) men suffer a higher prostate cancer (PCa) burden than other groups.
Objective: We aim to determine the impact of race on the risk of upgrading, upstaging, and positive surgical margins (PSM) at radical prostatectomy (RP) among men eligible for active surveillance.
Design, setting, and participants: We studied men with low-risk PCa treated with RP at two centers. Low clinical risk was defined by National Comprehensive Cancer Network criteria. Outcome variables were upgrading, upstaging, and PSMs at surgery. Associations between race and the outcomes were evaluated with logistic regression adjusted for age, relationship status, diagnostic prostate-specific antigen level, percentage of positive biopsy cores, surgical approach, year of diagnosis, and clinical site.
Results and limitations: Of 9304 men diagnosed with PCa, 4231 were low risk and underwent RP within 1 yr. Men were categorized as *AA* ($n = 273$; 6.5%), *Caucasian* ($n = 3771$; 89.1%), or *other racial/ethnic group* (*Other*; $n = 187$; 4.4%). AA men had a significantly younger mean age (58.7 yr; standard deviation: ±7.06), and fewer (85%) were married or had a partner. Upgrading (34%) and upstaging (13%) rates did not significantly differ among the groups. The PSM rate was significantly higher in AA men (31%) than in the Caucasian (21%) and Other (20%) groups ($p < 0.01$). We found an association between race group and PSM rate ($p < 0.03$), with higher odds of PSMs in AA men versus Caucasian men (odds ratio [OR]: 1.64; 95% confidence interval [CI], 1.08–2.47). No statistically significant associations between race and rates of upgrading and upstaging were found. This study was limited by the relatively low proportion of AA men in the cohort.
Conclusions: Among clinically low-risk men who underwent RP, AA men had a higher likelihood of PSMs compared with Caucasian men. We did not find statistically significantly different rates of upgrading and upstaging between the race groups.
Patient summary: We analyzed two large groups of men with what appeared to be low-risk prostate cancer based on the initial biopsy findings. The likelihood of finding worse disease (higher grade or stage) at the time of surgery was similar across different racial groups.

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1. Introduction

Prostate cancer (PCa) is the leading noncutaneous cancer in men, with an estimated incidence of 233 000 and related deaths reaching 29 480 in 2014 [1]. Prostate-specific antigen (PSA) testing has led to earlier PCa detection, resulting in an increased number of men being diagnosed and treated, which, in turn, has reduced the proportion of PCa metastasis and disease-specific mortality. Nevertheless, African American (AA) men are known to suffer a substantial and disproportionate PCa burden, with studies showing higher incidence, more-advanced stages at diagnosis, more aggressive tumors, and poorer outcomes than other racial groups [2–5].

PCa management decisions depend on disease stage and grade, among other prognostic factors. Men with clinically low-risk disease are often well suited for active surveillance (AS) rather than immediate treatment. However, despite improvements in clinical and pathologic assessment, there are considerable levels of upgrading and upstaging between biopsy and radical prostatectomy (RP). Upgrading and upstaging are well described in men otherwise eligible for AS who undergo surgery instead as primary treatment [6,7]. Depending on the criteria for defining AS eligibility, upgrading occurs in 23–35% of cases. Although upgrading may be related to the natural history of PCa, it also may be due to sampling error that is unveiled by more complete pathologic examination of the prostatic specimen after RP.

A 2013 study [7] compared AA and Caucasian men diagnosed with very low-risk disease who were candidates for AS but elected to undergo immediate RP. This study found a significantly lower rate of organ-confined cancers, higher rate of Gleason upgrading, and higher average postoperative risk score in AA men. These findings were observed in a single-institution cohort and may not be generalizable. Therefore, using a broader cohort from multiple institutions across the United States, we assessed whether patient race was associated with likelihood of upgrading and upstaging at RP for patients with disease that was presumed to be very low risk by established criteria. We also evaluated whether outcomes were worse for AA men compared with Caucasian and other men, including Asian, Pacific Islander, Latino, and Native American men.

2. Methods

The current study included men diagnosed with PCa between 1990 and 2012 and treated with RP within 1 yr of diagnosis. Participants are enrolled in the Urologic Oncology Database (UODB) at the University of California, San Francisco (UCSF), Department of Urology, or in the Cancer of the Prostate Strategic Urologic Research Endeavor (CaPSURE) registry, a national, longitudinal, disease registry including men treated at 43 practice sites across the United States [8]. All study subjects consented to participate in research under central institutional review board supervision and underwent surgery at UCSF or at one of the CaPSURE sites. Patients in both cohorts are followed until death or study withdrawal.

The UODB and CaPSURE studies gather demographic, clinical, and surgical pathology data. The exposure variable was patient race, self-reported as *AA* (Black, Carribean, African, African American), *Caucasian* (White, Middle Eastern, European, European American), or *Other* (Asian/Pacific Islander, Native American, Latino/Hispanic, mixed race). Independent variables at diagnosis were age, relationship/marital status, PSA value, clinical TNM stage, biopsy Gleason grade, and biopsy cores sampled and positive, and percentage of tumor tissue. CaPSURE patients also reported education, insurance, body mass index, and medical history. Outcomes at RP were upgrade to at least 3 + 4, upstage to pT3 or pN1, and positive surgical margins (PSMs).

Participants were diagnosed with low clinical risk defined as PSA level $<$10 ng/ml, biopsy Gleason grade 2–6, and stage cT1/2a according to National Comprehensive Cancer Network (NCCN) 2012 guidelines, and further classified by AS eligibility criteria according to both Johns Hopkins University and UCSF. Hopkins criteria—echoed in the NCCN "very low risk" disease definition—include grade 2–6 with no 4/5 pattern, PSA density $\leq$0.15 ml, stage cT1, fewer than three positive cores, and $\leq$50% of any single core being positive [9]. UCSF criteria are slightly broader: Gleason grade 2–6, PSA level $\leq$10 ng/ml, stage cT1/2, $\leq$33% of cores positive, and $\leq$50% of any single core being positive [10]. Patients were classified as having met Hopkins criteria, met UCSF criteria but not Hopkins criteria, or met neither set of criteria (no man met UCSF but not Hopkins criteria). Postoperative risk was defined using the validated UCSF Cancer of the Prostate Risk Assessment (CAPRA-S) score computed from surgical pathology findings [11].

Independent characteristics were compared across the three race groups (AA, Caucasian, Other) and among the three risk groups (Hopkins, UCSF, neither) using frequency tables and the chi-square test for categorical variables and means, and analysis of variance for continuous variables.

Associations between race and outcome variables were evaluated with logistic regression. Models were adjusted for age and relationship status (factors in treatment decision-making), biopsy cores sampled and determined to be positive, clinical risk group, individual clinical site, surgical approach (open vs robotic laparoscopic), nerve sparing, and year of diagnosis. Secondary analyses of patient subsets addressed other factors that could influence outcomes. A model of patients who met each set of AS eligibility criteria was run to assess race groups that undergo similar follow-up regimens. We modeled subsets of patients treated only at academic and at community-based sites to account for variations in practice patterns. Model covariates were selected a priori, assessed for inter-item correlations, and pared down for final model inclusion. A p value $<$0.05 was considered significant. Analyses were completed using SAS v.9.2 (SAS Institute Inc, Cary, NC, USA).

3. Results

Among UODB and CaPSURE, 9304 men were diagnosed with PCa between 1990 and 2012, 8999 of whom underwent RP within 1 yr of diagnosis. Of those, 4231 met criteria for low-risk PCa and formed the study cohort of 273 AA men (6.5%), 3771 Caucasian men (89.1%), and 187 men placed in the Other group (4.4%). AA men were diagnosed with PCa at a younger mean age of 58.7 yr (standard deviation [SD]: 7.1 yr) compared with the Caucasian and Other groups ($p < 0.01$). Fewer AA men (85%) were married or had a partner compared with Caucasian (92%) and Other men (90%) ($p < 0.01$). In CaPSURE, level of education was higher in Caucasian men. AA men had higher rates of comorbidities compared with Caucasian and Other men. Most AA men (79%) were treated at community-based rather than academic centers compared with 60% of Caucasians and 66% of Other men ($p < 0.01$) (Table 1).

AA men had the fewest mean biopsy cores sampled (7.9; SD: 3.34) and highest percentage of positive cores (35.5; SD:

Table 1 – Patient characteristics at diagnosis of 4231 men managed at University of California, San Francisco, and CaPSURE sites

Characteristic*	AA (n = 273)	Caucasian (n = 3771)	Other (n = 187)	p
Age, yr, mean (SD)	58.7 (7.06)	60.0 (6.90)	60.5 (7.00)	<0.01
Married/partnered	157 (85)	2914 (92)	150 (90)	<0.01
Education level**				<0.01
Some high school	50 (31)	164 (8)	12 (24)	
High school degree	38 (23)	532 (24)	13 (25)	
Some college	36 (23)	441 (20)	16 (31)	
College degree	38 (23)	1040 (48)	10 (20)	
Insurance**				<0.01
Medicare plus supplement	33 (15)	604 (23)	15 (23)	
Medicare only	19 (8)	191 (7)	6 (9)	
Private or veteran	152 (69)	1801 (68)	40 (63)	
Other	17 (8)	38 (2)	3 (5)	
Stroke**	7 (4)	95 (4)	5 (9)	0.20
Obesity (BMI: 30–34.9)**	39 (26)	425 (20)	11 (22)	0.20
Heart disease	14 (8)	297 (14)	7 (13)	0.16
Hypertension**	99 (59)	827 (38)	20 (38)	<0.01
Diabetes**	27 (16)	149 (7)	7 (13)	<0.01
Smoking**	36 (23)	192 (9)	5 (10)	<0.01
≥7 drinks per week**	21 (28)	402 (31)	6 (29)	0.78
PSA level, ng/ml, median (IQR)	5.6 (4.5–7.2)	5.2 (4.2–6.5)	5.4 (4.3–6.6)	<0.01
Biopsy cores sampled, mean (SD)	7.9 (3.34)	9.2 (4.02)	9.9 (4.93)	<0.01
Positive cores, mean (SD)	2.5 (1.62)	2.4 (1.83)	2.3 (1.90)	0.70
Positive cores, %, mean (SD)	35.5 (24.25)	30.8 (23.31)	29.3 (24.97)	<0.01
Positive tissue, %, median (IQR)	7.5 (5–11.5)	7.0 (3–16)	5.5 (2–12)	0.70
Prostate volume, ml, median (IQR)	23.0 (0–39)	30.9 (7–43)	17.3 (0–31)	<0.01
Clinical T stage				
T1	171 (63)	2099 (56)	91 (49)	0.01
T2	102 (37)	1672 (44)	96 (51)	
Clinical CAPRA risk score, mean (SD)	1.6 (0.75)	1.5 (0.69)	1.5 (0.68)	0.16
Met UCSF criteria for AS	121 (50)	2139 (63)	113 (68)	<0.01
Met Hopkins criteria for AS	83 (35)	1177 (37)	37 (26)	0.01

AA = African American; AS = active surveillance; BMI = body mass index; CAPRA = Cancer of the Prostate Risk Assessment; IQR = interquartile range; PSA = prostate-specific antigen; SD = standard deviation; UCSF = University of California, San Francisco.

* Data given as number (percentage) unless otherwise indicated.

** Due to missing data, values may not sum to the total number of patients.

24.25) (both $p < 0.01$, but median tumor tissue did not differ by group [7%; interquartile range (IQR): 3–16%]). Fewer AA men (50%) met UCSF AS eligibility criteria compared with Caucasian (63%) and Other (68%) men ($p < 0.01$). More AA (35%) and Caucasian men (37%) met Johns Hopkins criteria compared with 26% of men in the Other group ($p = 0.01$). Caucasian men had highest median prostate volume (31 ml: IQR: 7–43 ml; $p < 0.01$). Rates of open versus laparoscopic surgery were higher for AA men (82%) and Caucasian men (81%) compared with Other men (73%; p ? 0.01). Median follow-up after RP was 61 mo (IQR: 30–100 mo).

Pathologic outcomes after surgery are presented in Table 2. Overall upgrade was 34% and did not differ significantly between groups. Most (67%) patients had Gleason grade 2–6, 30% had grade 3 + 4, and 3% had grade 4 + 3 or higher. The upstage rate of 13% and proportion of CAPRA-S ≥3 also were similar across the groups. Positive lymph nodes occurred in 14 Caucasian men (<1%) and in no AA or Other men. Extracapsular extension (ECE) occurred in 12% of all men, while seminal vesicle involvement (SVI) was found in 2% of patients. The PSM rate was significantly higher in the AA group (31%) compared with the Caucasian (21%) and Other (20%) groups ($p < 0.01$). PSM rates were also lower in academic (15%) versus community-based (24%) sites ($p < 0.01$).

Rates of upgrade (44%), upstage (19%), ECE (18%), SVI (3%), and PSM (28%) were higher in men meeting eligibility criteria for AS (Table 2). Proportions were lowest in men meeting Johns Hopkins criteria (p ? 0.01). Rates of upstage/pN1, upgrade, and CAPRA-S ≥3 were significantly higher in men meeting neither set of eligibility criteria for AS.

Associations of race group with surgical pathology outcomes were evaluated in a series of logistic regression models adjusted for clinical variables, year of diagnosis, and individual clinical site (Table 3). Race group was associated with surgical margin status: AA men had higher odds of PSMs than Caucasian (odds ratio [OR]: 1.64; 95% confidence interval [CI], 1.08–2.47) and Other men (OR: 1.41; 95% CI, 0.90–2.23; $p = 0.03$). Race was not associated with upgrade or upstage compared with Caucasian and Other men combined.

In subset analysis, race and PSM remained similarly associated among patients meeting the UCSF eligibility criteria for AS (OR: 2.44; 95% CI, 1.39–4.29 for AA vs Caucasian men; $p < 0.01$). In patients treated at community-based sites, odds of PSM were higher for AA men (OR: 2.05; 95% CI, 1.29–3.26) compared with Caucasian men ($p = 0.01$).

Table 2 – Postoperative pathologic outcomes of 4231 men managed at University of California, San Francisco, and CaPSURE sites

Characteristic*	Race/ethnicity				Active surveillance criteria			
	AA (*n* = 273)	Caucasian (*n* = 3771)	Other (*n* = 187)	*p*	Hopkins criteria (*n* = 1297)	UCSF criteria (*n* = 901)	Neither (*n* = 1201)	*p*
RP approach				<0.01				0.02
Open retropubic	224 (82)	3053 (81)	137 (73)		1055 (81)	719 (80)	949 (79)	
Robotic	22 (8)	578 (15)	43 (23)		186 (14)	160 (18)	208 (17)	
Other	27 (10)	139 (4)	70 (4)		56 (4)	21 (2)	44 (4)	
Gleason grade				0.27				<0.01
2–6	176 (68)	2393 (67)	115 (65)		960 (78)	562 (63)	641 (56)	
7 (3 + 4)	75 (29)	1077 (30)	54 (31)		234 (19)	291 (33)	462 (40)	
7 (4 + 3)	0 (0)	43 (1)	5 (3)		8 (1)	18 (2)	8 (1)	
8–10	6 (2)	81 (2)	3 (2)		21 (2)	15 (2)	33 (3)	
Upgrade	71 (34)	1003 (33)	49 (33)	0.98	263 (22)	314 (36)	411 (44)	<0.01
T stage				0.36				<0.01
T2	199 (87)	3043 (87)	144 (84)		1078 (93)	763 (87)	877 (81)	
T3	30 (13)	425 (12)	26 (15)		84 (7)	106 (12)	204 (19)	
T4	1 (<1)	12 (<1)	2 (1)		1 (<1)	5 (1)	5 (<1)	
ECE	24 (11)	377 (11)	27 (16)	0.20	71 (6)	94 (11)	185 (18)	<0.01
SVI	6 (2)	75 (2)	4 (2)	0.93	16 (1)	19 (2)	34 (3)	0.02
Upstage/pN1	31 (13)	440 (13)	28 (16)	0.36	86 (7)	111 (13)	209 (19)	<0.01
Upgrade and/or upstage	89 (36)	1221 (34)	62 (35)	0.78	283 (24)	355 (40)	507 (45)	<0.01
Positive margin, *n* (%)	76 (31)	746 (21)	35 (20)	<0.01	202 (17)	197 (22)	318 (28)	<0.01
CAPRA-S ≥3	3 (10)	180 (18)	26 (22)	0.23	17 (8)	58 (18)	79 (23)	<0.01

AA = African American; CAPRA-S = Surgical Cancer of the Prostate Risk Assessment; ECE = extracapsular extension; RP = radical prostatectomy; SVI = seminal vesicle invasion; UCSF = University of California, San Francisco.
* Data given as number (percentage) unless otherwise indicated.

Table 3 – Multivariate logistic regression results with surgical pathology outcomes (all low-risk patients) of 4231 men managed at University of California, San Francisco, and CaPSURE sites

Outcome	Independent variable	*p*	Odds ratio	95% CI, lower limit	95% CI, upper limit
Upgrade	Race: AA vs Caucasian	0.13	1.438	0.959	2.157
	Race: AA vs other	–	0.824	0.545	1.245
	Age at diagnosis, yr	<0.01	1.036	1.023	1.049
	Relationship: yes vs no	0.87	1.119	0.826	1.517
	PSA level at diagnosis, ng/ml	<0.01	1.114	1.064	1.166
	Biopsy cores number taken	0.29	0.986	0.959	1.013
	Biopsy cores, % positive	<0.01	1.019	1.014	1.023
	Surgical approach: laparoscopic vs open	0.64	0.891	0.663	1.198
	Surgical approach: other vs open	–	1.168	0.665	2.049
	Year of diagnosis	<0.01	1.056	1.026	1.088
	Individual clinical site, categorical	<0.01	–	–	–
Upstage/pN1	Race: AA vs Caucasian	0.64	1.153	0.665	1.998
	Race: AA vs other	–	1.242	0.736	2.098
	Age at diagnosis, yr	<0.01	1.030	1.012	1.048
	Relationship: yes vs no	0.77	1.066	0.697	1.632
	PSA level at diagnosis, ng/ml	<0.01	1.164	1.096	1.236
	Biopsy cores number taken	0.02	1.040	1.007	1.074
	Biopsy cores, % positive	<0.01	1.019	1.014	1.023
	Surgical approach: laparoscopic vs open	0.49	0.716	0.319	1.609
	Surgical approach: other vs open	–	1.190	0.800	1.772
	Year of diagnosis	0.05	0.964	0.929	1.000
	Individual clinical site, categorical	0.13	–	–	–
Positive surgical margins	Race: AA vs Caucasian	0.03	1.635	1.081	2.473
	Race: AA vs other	–	1.413	0.897	2.227
	Age at diagnosis, yr	0.26	1.008	0.994	1.022
	Relationship: yes vs no	0.19	0.805	0.580	1.118
	PSA level at diagnosis, ng/ml	<0.01	1.121	1.069	1.176
	Biopsy cores number taken	<0.01	1.049	1.020	1.080
	Biopsy cores, % positive	<0.01	1.013	1.009	1.017
	Surgical approach: laparoscopic vs open	0.91	1.088	0.619	1.911
	Surgical approach: other vs open	–	1.058	0.754	1.484
	Year of diagnosis	0.03	0.967	0.939	0.996
	Individual clinical site, categorical	<0.01	–	–	–

AA = African American; CI = confidence interval; PSA = prostate-specific antigen.

Race and PSM were not associated in men meeting Johns Hopkins AS criteria or among those treated only at academic sites, nor was race associated with upgrading, upstaging, or CAPRA-S $\geq$3 in any subset models. In an additional subset analysis, race was not associated with PSM among men undergoing robot-assisted prostatectomy, but only 22 AA men in the cohort underwent robot-assisted surgery, limiting the power of this analysis.

4. Discussion

The literature indicates that genetic predisposition and environmental factors partly contribute to racial disparities observed in PCa patients. Among the biologic differences, higher levels of circulating androgens [12] and proportions of susceptibility alleles in the metabolism pathways for androgens [13] may contribute to greater disease burden in AA men. An important environmental factor is the high consumption of animal fat, which is reported to be both common in AA diets and associated with increased risk of PCa [14]. Moreover, AA men may suffer more from traumatic stress related to PCa than non-AA men [15,16].

There is a mixed picture regarding PCa aggressiveness in AA men. Many studies have found more advanced disease at diagnosis [17], while other studies show poorer survival in AA men compared with other racial groups [1]. Conversely, some studies report no differences in age and clinical stage at diagnosis between AA and Caucasian men in settings of equal access to health care [18] and similar overall mortality rates across racial groups after treatment [19]. These disparate findings were derived mainly retrospectively from cohorts with varying sociodemographics, clinical risk, treatment regimens, and follow-up. Among men with PCa managed with AS, AA race has been linked to discontinuation of surveillance followed by active treatment [20]. After RP for all-risk localized disease, AA men have been found to have more adverse pathologic features [21].

In our study, AA men had higher rates of comorbidities, lower levels of education, and less comprehensive insurance coverage than other racial groups. These differences corroborate findings of many studies [17,19]. Researchers have also noted that strong social support may contribute to treatment patterns that influence outcomes [2]. Following progression during AS, AA men often forego RP [22] in favor of radiation or another nonsurgical therapy for PCa [23]. Such treatment patterns, together with the referral populations represented by UODB and CaPSURE sites, may explain, in part, the lower representation of AA men in our cohort.

A recent Johns Hopkins study [7] compared AA and Caucasian men diagnosed with very low-risk PCa who underwent immediate RP and found that AA race was strongly and independently associated with upgrade and upstage after surgery. While these findings were notable because favorable outcomes had been expected among such a low-risk group, the cohort was from a single academic institution, which may limit the generalizability of the results. In contrast, our study did not find statistically significant differences in upgrading and upstaging rates between AA and Caucasian men, even despite apparent biopsy undersampling of AA men. Our finding suggests that with equal access to care and comparable clinical characteristics, pathologic outcomes may be similar across racial groups, as put forth by other studies [18,25,26].

Neither the Hopkins study nor our study evaluated tumor location and size. However, in another analysis of the same Hopkins cohort, Sundi et al. [27] reported that AA men diagnosed with very low-risk PCa were more likely to have a Gleason score $\geq$7 (37% vs 11%; $p < 0.001$) and tumor volume $\geq$0.5 ml (45% vs 21%; $p = 0.001$) at RP compared with Caucasian men. Among those whose tumor was upgraded, the dominant nodule was more frequently anterior in AA men. At UCSF, anterior biopsies are part of the standard schema [28], which may improve chances of identifying tumors among AA men and explain why upgrading and upstaging rates are similar by race at UCSF. Unfortunately, the CaPSURE study does not collect tumor location data necessary to evaluate the impact of anterior findings in this combined UCSF–CaPSURE cohort.

The PSM rate was higher in AA men and this difference persisted among subsets of men who met UCSF eligibility criteria for AS and those at community-based practices, where AA men were treated at higher proportions than other men. We ran many preliminary models to disentangle factors that may influence the association between race and margin status: surgical approach, nerve sparing, site type and size, year of diagnosis, and changing practice patterns. Ultimately, we controlled for approach, for year, and for individual site as a proxy of clinic size and volume, as well as academic versus clinical setting. While our PSM finding for AA men is inconsistent with some previous studies [24,29], PSM rate is associated with higher risks of biochemical recurrence and cancer-specific mortality in AA men who have undergone RP [30]. What explains the relationship between AA race and risk of PSM is unclear. However, anatomic pelvic variations are believed to increase the risk of PSM during RP in AA men due to steeper symphysis pubis angles and smaller midpelvis areas in AA men compared with Caucasian men [31]. In this situation, the risk of apical PSM is higher.

We acknowledge limitations to the current study. The proportion of AA men in the cohort is smaller than the national average. Some demographic and all comorbidity data were unavailable for UCSF patients, preventing adjustment for such characteristics in multivariate models. Upgrading and upstaging are far from perfect surrogates for aggressive biology. The fact that a man may have some indication of worse-than-expected pathology after surgery, particularly low-volume Gleason pattern 4 or focal ECE, does not mean that he would have progressed to incurable disease without treatment, nor that he was a poor candidate for AS. We do not have detailed information on tumor location for all men and thus cannot validate previously reported findings regarding higher incidence of anterior tumors among AA men [27]. We also lack data on risk and focal versus extensive margins and on details regarding

extent of nerve sparing, due to variation in reporting across multiple practices. Among participants who reported that they were "African American", some men were born in Africa or the Carribean, rather than in the Americas.

Strengths of this study are the broad, nationwide sample of participants from community-based, academic, and Veterans Affairs sites and the comprehensive follow-up provided by AS programs. Our study represents one of the largest reported cohorts (n = 273) of low-risk AA men who qualify for AS with a median follow-up of 56 mo.

5. Conclusions

We studied low-risk patients who underwent RP within 1 yr of diagnosis. AA men were younger, had lower levels of education and insurance coverage, and had higher rates of comorbidities than Caucasian and Other race groups. The groups had similar clinical characteristics before surgery. Neither upgrading nor upstaging varied statistically significantly by race. However, higher PSM was associated with AA race. Studies with larger representation of AA men are greatly needed to better assess the role of race/ethnicity in pathologic outcomes after RP.

Author contributions: Matthew R. Cooperberg had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Study concept and design: Cooperberg.
Acquisition of data: Carroll, Cooperberg.
Analysis and interpretation of data: Cowan, Jalloh, Myers, Cooperberg.
Drafting of the manuscript: Jalloh, Myers, Cowan, Cooperberg.
Critical revision of the manuscript for important intellectual content: Jalloh, Cowan, Carroll, Cooperberg.
Statistical analysis: Cowan.
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