

Black Race Predicts Significant Prostate Cancer Independent of Clinical Setting and Clinical and Socioeconomic Risk Factors

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Background

- Black men have 1.6 fold higher prostate cancer (PCa) incidence and 2-3 times the mortality rate compared to White men
- Studies have linked Black race to PCa risk but most fail to account for established risk factors such as 5-ARI use, prostate volume, socioeconomic status, and clinical setting

Research Objectives

- To assess whether Black race independently predicts overall and significant Pca diagnosis on initial biopsy when controlling for established clinical, behavioral and socioeconomic risk factors, and hospital funding type in a multi-racial cohort
- To examine changes in the effect size of Black race in men ages 40-54, who are excluded from US Preventive Services Task Force (USPSTF) PCa screening recommendations

Methods

- Recruited 564 men over age 40 undergoing initial prostate biopsy for abnormal PSA or digital rectal examination (DRE) from three publicly funded and two private hospitals in Chicago from 2009-2014
- Genetic West African ancestry (WAA) estimated using panel of 105 ancestry informative markers
- Multivariate analyses examined the associations between clinical setting, race, WAA, clinical and sociodemographic risk factors, PCa diagnosis and Gleason $\geq 3+4$ PCa
- Subgroup analysis performed for men age 40-54

Results

- Black men had higher median PSA (8.1 vs 5.6 ng/ml), PSAD (0.22 v 0.15 ng/ml/cm³) compared to non-Blacks (all p<0.05)
- Blacks had lower frequency of marriage (39.0% vs 72.2%), higher rates of poverty (61.7% vs 43.3%), were more likely to have smoked (64.8% vs 56.0%) and more likely to be recruited from public hospitals (89.2% vs 51.3%, all p<0.05)
- Blacks had increased rates of Gleason $\geq 3+4$ PCa relative to non-Blacks in both public (27.7% vs 11.6%, p<0.001) and private (48.4% vs 21.6%, p=0.002) settings
- WAA was not predictive of overall PCa diagnosis in Blacks either as a continuous variable (p=0.71) or in quartiles (Q1-Q3, p=0.17, 0.86, 0.13 respectively)
- For men aged <55, Black race (OR 5.66, 95% CI: 1.39-23.16, p=0.02) and family history (OR 4.98, 95% CI: 1.39-17.87, p=0.01) were independently positively associated with overall PCa diagnosis

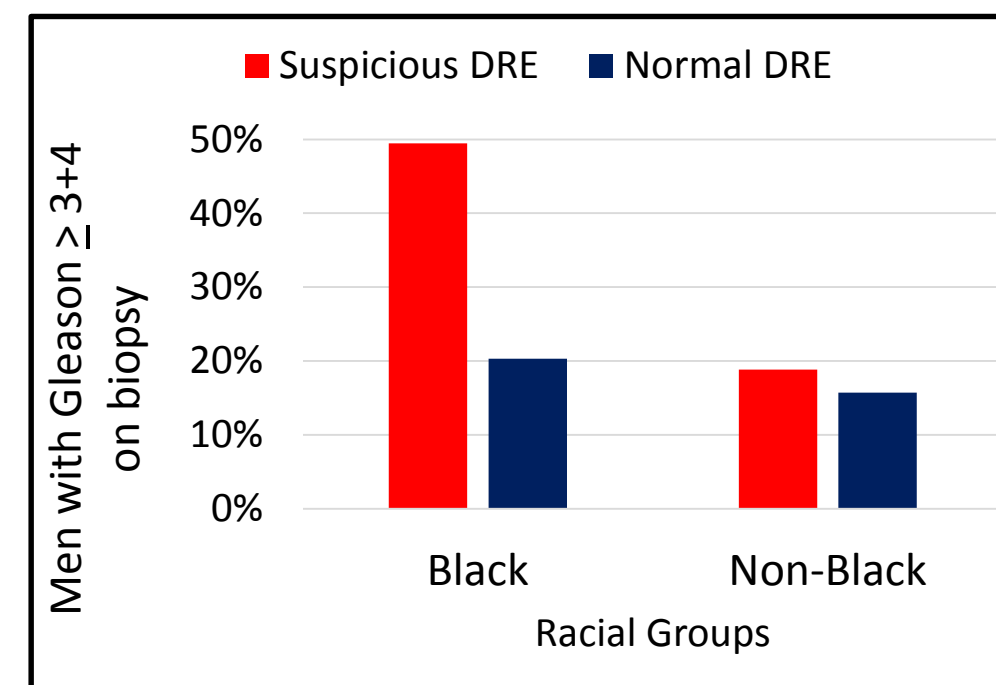


Table 1: Biopsy outcomes stratified by race

Limitations

- Central pathologic review was not performed across sites
- Referred population
- Race was self-reported, used as a proxy for genetics and environmental exposures

Multivariable Logistic Regression for Cancer on Biopsy vs. Negative Biopsy			Multivariable Logistic Regression for Gleason $\geq 3+4$ Prostate Ca vs. Gleason 3+3/Negative Biopsy		
Covariates	Odds Ratio (95% C.I.)	p value	Covariates	Odds Ratio (95% C.I.)	p value
Black race	2.13 (1.33-3.40)	0.002	Black race x Abnormal DRE	2.93 (1.31-6.53)	0.009
Abnormal DRE (yes)	1.14 (0.74-1.76)	0.57	Black race x Normal DRE ^a	1.14 (0.56-2.32)	0.72
			Non-Black race x Abnormal DRE ^a	0.86 (0.39-1.94)	0.72
			Non-Black race x Normal DRE ^{a (ref)}	1	-
1st degree Fam Hx (yes)	1.74 (1.07-2.83)	0.02	1st degree Fam Hx (yes)	1.48 (0.86-2.56)	0.16
Age, years	1.04 (1.01-1.07)	0.02	Age, years	1.05 (1.01-1.08)	0.02
Log(PSA), ng/ml	4.32 (2.29-8.14)	<0.001	Log(PSA), ng/ml	13.09 (6.06-28.27)	<0.001
Publicly funded site (yes)	0.53 (0.28-0.98)	0.04	Publicly funded site (yes)	0.29 (0.14-0.60)	0.001
High School completion (yes)	1.17 (0.74-1.84)	0.49	High School completion (yes)	0.84 (0.48-1.48)	0.55
Prostate volume, cm³	0.98 (0.97-0.99)	<0.001	Prostate volume, cm³	0.98 (0.97-0.99)	<0.001
5-ARI use (yes, ≥ 6 months)	0.38 (0.19-0.74)	0.004	5-ARI use (yes, ≥ 6 months)	0.32 (0.12-0.85)	0.02
Married (yes)	0.86 (0.56-1.33)	0.81	Married (yes)	0.61 (0.36-1.03)	0.06
Annual Income < \$30K/year	1.1 (0.67-1.78)	0.72	Annual Income < \$30K/year	1.15 (0.64-2.06)	0.63

Note: Bolded variables have a p-value < 0.05.

Table 3: Binary logistic regressions for Black race versus overall prostate cancer and Gleason $\geq 3+4$ prostate cancer diagnosis

Conclusions

- Black race remains associated with PCa after adjusting for clinical setting, clinical and socioeconomic risk factors
- Black race is the strongest risk factor of PCa for men under 55 years
- West African Ancestry does not predict overall or significant PCa in models substituting WAA in place of Black race

	Black (N=287) N (%)	Non-Black (N=277) N (%)	p value
Biopsy Outcomes			
Cancer on Biopsy	181 (63.1)	115 (41.5)	<0.001
\geq Gleason 3+4	86 (47.5)	46 (40.0)	<0.001
\geq Gleason 4+4	26 (14.4)	11 (9.6)	0.02

Figure 1: Race and abnormal rectal exam and frequency of Gleason $\geq 3+4$ PCa