A nationwide VA study on first-line systemic treatment patterns in Black men with metastatic castration-resistant prostate cancer

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Background

We investigated treatment patterns using a nationwide Veterans Affairs (VA) cohort to generate the largest cohort of Black men with metastatic castration-resistant prostate cancer (mCRPC, to our knowledge) for adequately powered assessments of non-biological factors of race that can drive disparities in systemic therapy outcomes between Black and White men. We hypothesized that differences in systemic therapy outcomes between Black and White men with mCRPC are attributable to variations in treatment patterns by race, specifically, usage of standard therapies and time to initiation of first-line mCRPC therapies by race.

Methods

This was a retrospective cohort study of mCRPC patients within VA Informatics and Computing Infrastructure (VINCI) using artificial intelligence (AI)-based race and metastasis models developed by natural language processing (NLP). Queries within VINCI identified male Veterans diagnosed with mCRPC from 2000-2023 receiving a standard first-line mCRPC therapy. Differences in drug usage rates, time to first-line mCRPC treatment initiation from diagnosis of mCRPC, and prostate-specific antigen (PSA) response between race were compared by Chi-Square or Wilcoxon rank-sum tests. The association between race and treatment outcomes: overall survival (OS), time to PSA progression, and PSA response were assessed by univariable and multivariable logistic regression. Models were adjusted for receipt of drug, time to first-line treatment initiation, and other clinical covariates.

Results

From January 2000-December 2023, our final cohort was comprised of 27,296 men (6,796 Black and 20,500 White). White men tended to be older (median age 74 vs. 70) and have higher rates of tobacco use (37% vs. 30%) and obesity (35% vs. 32%), while Black men had higher baseline PSA levels (8.9 vs. 7.4 ng/mL) and comorbidity scores (CCI ≥4 30% vs. 23%). First-line treatment usage rates between Black vs. White men were: docetaxel (21.5% vs. 16.5%), abiraterone (42.6% vs. 45.8%), enzalutamide (27.8% vs. 29.9%), and other (6.8% vs. 6.6%). Black race was significantly associated with a delay in time to first-line mCRPC therapy initiation vs. White race (regression coefficient 134 days, 95% CI 113-156, $p<0.001$) following adjustment of prognostic variables. Following adjustment for first-line mCRPC therapy, time to treatment initiation, and relevant clinical covariates, Black men had significant and consistently improved outcomes compared to White men for OS (HR 0.70, 95% CI 0.66-0.73, $p<0.001$), time to PSA progression (HR 0.92, 95% CI 0.86-0.99, $p<0.017$), and time to PSA response (≥30% maximum decline, HR 0.93, 95% CI 0.88-0.99, $p=0.012$).

Conclusions

Using one of the largest cohorts for mCRPC health disparities, this nationwide VA study identified disparities in first-line systemic therapy outcomes between Black and White men related to treatment patterns, particularly time to initiation of first-line mCRPC systemic therapies. Our findings warrant further investigation and can inform efforts to mitigate racial disparities in prostate cancer.

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Conflicts of Interest Disclosure Statement

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