Racial differences in adverse outcomes following androgen deprivation therapy for prostate cancer

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INTRODUCTION

- Prostate cancer (PCa) remains the second leading cause of cancer death among males in the U.S.
- To treat patients with PCa, androgen-deprivation therapy (ADT) has been used over the past several decades. Although clinical trials have shown survival benefits from ADT, growing evidence has shown the adverse effects of this therapy.
- It remains unknown whether the receipt of ADT and the related adverse outcomes differ by race. Accordingly, the objective of this study was to evaluate racial disparities in ADT and their impact on ADT-related adverse outcomes across population groups.

METHODS

- This was a retrospective cohort study using the Surveillance, Epidemiology, and End Results (SEER)-Medicare dataset.
- Males with a primary diagnosis of metastatic prostate cancer aged 66 years or older between January 2010 and December 2017 were identified from the dataset.
- The ADT-related outcomes comprised of genitourinary complications, depression, ischemic and thrombotic events, and cardiovascular events.
- Patients were considered as experiencing the outcomes if they had any inpatient claim with CTP codes or at least 2 physician/outpatient claims billed at least 30 days apart any of the events. Incidence of these adverse outcomes were examined stratified by race.
- Competing risk regression models were used to determine the effects of race on ADT-related complications after controlling for a number of covariates such as age at diagnosis, year of diagnosis, marital status, income quintile, residence of metropolitan area, SEER region, Gleason score, and Charlson comorbidity score.

RESULTS

- Table 1 shows incidence of each ADT-related complications by race obtained from ANOVA. Overall, there were significant differences in the incidence of genitourinary events, depression, and ischemic and thrombotic events by race. However, there was no significant difference in the incidence of cardiovascular events across race.
- Specifically, non-Hispanic Caucasians were more likely to experience genitourinary events than non-Hispanic African Americans and Asians or Pacific Islanders (56.14% vs. 48.77% and 56.14% vs. 44.34%, respectively). Also, a percentage of those reported depression was higher among non-Hispanic Caucasians than Asians or Pacific Islanders (21.12% vs. 14.24%). Finally, non-Hispanic African Americans were more likely to develop ischemic and thrombotic events compared to non-Hispanic Caucasians (16.98% vs. 13.87%).
- Table 2 presents comparative risk of ADT-related complications stratified by race after adjusting for covariates.

Table 1. Incidence of ADT-associated adverse events by race

	Group	% of incidence	*p*-value
Genitourinary events	Caucasian	56.14% (=1065/1897)	***0.009***
	African American	***48.77% (=159/326)******
	American Indian/Alaska Native	70.83% (=17/24)
	Asian or Pacific Islander	***44.34% (=47/106)******
	Hispanic	52.33% (=90/172)
Depression	Caucasian	21.12% (=1058/5010)	***0.014***
	African American	18.80% (=144/766)
	American Indian/Alaska Native	12.20% (=5/41)
	Asian or Pacific Islander	***14.24% (=42/295)******
	Hispanic	20.19% (=104/515)
Ischemic and thrombotic events	Caucasian	13.87% (=728/5249)	***< 0.001***
	African American	***16.98% (=127/748)******
	American Indian/Alaska Native	8.33% (=4/48)
	Asian or Pacific Islander	10.07% (=30/298)
	Hispanic	11.52% (=60/521)
Cardiovascular events	Caucasian	41.97% (=961/2290)	0.607
	African American	46.31% (=188/406)
	American Indian/Alaska Native	44.83% (=13/29)
	Asian or Pacific Islander	40.00% (=48/120)
	Hispanic	42.97% (=110/256)

RESULTS (cont'd)

Table 2. Comparative risk of ADT-associated adverse events by race after controlling for covariates

	Group	Hazard ratio [95% CI]	*p*-value
Genitourinary events	***African American vs. Caucasian***	***0.473 [0.228, 0.979]***	***0.044***
	American Indian/Alaska Native vs. Caucasian	***7.277 [2.626, 20.162]***	***< 0.001***
	Asian or Pacific Islander vs. Caucasian	0.812 [0.491, 1.345]	0.419
	Hispanic vs. Caucasian	0.967 [0.653, 1.433]	0.868
Depression	African American vs. Caucasian	0.903 [0.503, 1.622]	0.733
	American Indian/Alaska Native vs. Caucasian	0.556 [0.077, 4.000]	0.560
	Asian or Pacific Islander vs. Caucasian	***0.490 [0.268, 0.894]***	***0.020***
	Hispanic vs. Caucasian	0.925 [0.642, 1.333]	0.675
Ischemic and thrombotic events	African American vs. Caucasian	1.025 [0.523, 2.008]	0.944
	American Indian/Alaska Native vs. Caucasian	0.716 [0.099, 5.176]	0.741
	Asian or Pacific Islander vs. Caucasian	***0.385 [0.167, 0.884]***	***0.024***
	Hispanic vs. Caucasian	0.643 [0.396, 1.045]	0.075
Cardiovascular events	African American vs. Caucasian	0.995 [0.564, 1.757]	0.987
	American Indian/Alaska Native vs. Caucasian	1.738 [0.697, 4.330]	0.235
	Asian or Pacific Islander vs. Caucasian	0.935 [0.500, 1.746]	0.832
	Hispanic vs. Caucasian	0.836 [0.584, 1.198]	0.330

- (Table 2) Compared with non-Hispanic Caucasians, non-Hispanic African Americans had a lower incidence of genitourinary complications (HR=0.47, 95% CI: 0.23-0.98) whereas American Indians/Alaska Natives had a higher risk of the complications (HR=7.28, 95% CI: 2.63-20.16). In addition, Asians or Pacific Islanders were less likely to experience depression (HR=0.49, 95% CI: 0.27-0.89) and ischemic and thrombotic events (HR=0.39, 95% CI: 0.17-0.88) than non-Hispanic Caucasians. Regarding the incidence of cardiovascular events, there was no significant difference across race.

DISCUSSION

- Study findings suggest that there existed racial disparities in incidence of ADT-related adverse events. Specifically, the incidence of genitourinary events was lower in non-Hispanic Black and higher in American Indians/Alaska Natives compared with non-Hispanic Whites. Moreover, the incidence of depression and ischemic and thrombotic events was lower in Asians or Pacific Islanders than non-Hispanic Whites. However, the incidence of cardiovascular events was not significantly different across race.
- Clinicians should pay attention to the population groups who are at greater rick for each ADT-related adverse outcome.