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Racial disparities in an aging population: The relationship between age and race in the management of African American men with high-risk prostate cancer

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ABSTRACT

Purpose: To evaluate the relationship between age and race on the receipt of definitive therapy among men with high-risk prostate cancer (CaP).
Methods: We used the Surveillance, Epidemiology and End Results Program to identify 62,644 men with high-risk CaP (PSA >20 or Gleason 8–10 or stage ≥cT3a) diagnosed from 2004 to 2010. Multivariable logistic regression analysis modeled the interaction between age and race and its association with receipt of definitive therapy on 57,674 patients (47,879 white men; 9,795 African American [AA] men) with complete data on the covariates of interest.
Results: Among men age ≥70, AA men had a higher risk of CaP-specific mortality (PCSM) compared to white men after adjusting for sociodemographic and prostate cancer-specific factors (Adjusted HR 1.20; 95% CI 1.02–1.38; $P = 0.02$). Nevertheless, a significant interaction between race and age was found ($P_{interaction} = 0.01$), such that the adjusted odds of receiving definitive treatment for AA vs. white was 0.67 (95% CI 0.62–0.73; $P < 0.001$) among men age <70, but was 0.60 (95% CI 0.55–0.66; $P < 0.001$) among men age ≥70, suggesting increased racial disparity in the receipt of definitive treatment among older men.
Conclusion: AA men with high-risk CaP are less likely to receive definitive therapy than white men. This disparity is significantly larger among men age ≥70, despite excess PCSM among AA men in this group. With a rapidly expanding population of older minority men, this disparity should be urgently addressed to prevent increasing disparities in cancer care.

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1. Introduction

In 2014, there will be approximately 238,590 new cases of prostate cancer and 29,480 deaths due to prostate cancer in the United States.[1] Among men ages 60–79, the leading cause of death in the United States is cancer, with prostate cancer being the second leading cause of cancer death.[1] The number of men age 65 and above in America increased by over 20 million from 2000 to 2010 and is expected to increase by another 25 million over the next decade, with the population of older adults from minority groups expected to grow by nearly 25%.[2] Given an increasing population of older adults (especially from minority groups) and increasing life expectancy in the United States, one can expect a greater number of older minority men to be diagnosed with prostate cancer in the near future.[1,2] Furthermore, with the new U.S. Preventive Services Task Force (USPSTF) recommendations against prostate-specific antigen (PSA) screening, there will likely be migration toward higher stage and grade among men with newly diagnosed prostate cancer.[3]

The form of localized prostate cancer with the greatest risk of mortality is high-risk disease.[1,4–6] Definitive therapy with either radical prostatectomy or radiation therapy reduces mortality in patients with high-risk prostate cancer and although there are well-defined guidelines for treating high-risk disease created by the National Comprehensive Cancer Network (NCCN), most level 1 evidence for definitive therapy comes from studies focusing on men age <65.[6–12] Hence, the role of age in the management of patients with prostate cancer has been controversial.[13,14] Many urologists postulate that the upper age limit for radical prostatectomy should be 70, and men over the age of 70 have been shown to receive curative treatment significantly less often than younger men.[13–17] Despite the challenges associated with managing older adults with prostate cancer, it has been suggested that definitive therapy results in significantly higher life expectancy as well as quality-adjusted life expectancy in men over the age of 70.[13,18]

Similarly, even with a greater incidence of prostate cancer and greater rates of prostate cancer-specific mortality (PCSM) among African American (AA) men when compared to white men, AA men are less likely to receive definitive treatment than white men even among patients with aggressive disease.[19–21] PCSM is an appropriate measure for studying disparities since it represents the furthest downstream outcome, namely death due to the disease. Any differences in PCSM between patient groups, while likely multifactorial, could be due to disparities in treatment patterns. Although efforts have been made to better understand cancer care patterns in older adults and by race, independently, there is little literature examining the relationship between age and racial disparities in the management of aggressive cancers. With a rapidly expanding population of minority older adults, it is critically important to understand this relationship.

We used the Surveillance, Epidemiology, and End Results (SEER) database to evaluate whether racial disparities in the receipt of definitive therapy for high-risk prostate cancer differed by age.

2. Methods

2.1. Patient Population and Study Design

The Surveillance, Epidemiology and End Results Program (SEER) program, sponsored by the National Cancer Institute, collects and reports cancer incidence, survival, and treatment data from 17 population based cancer registries. SEER captures approximately 97% of incident cancers and the 17 registries encompass nearly 28% of the US population.[22] Using the SEER program, we identified 62,644 African American (AA) and white men with localized non-metastatic high-risk prostate cancer (PSA >20 or Gleason 8–10 or stage ≥cT3a) [6] and information on PSA, Gleason, and stage diagnosed from 2004 to 2010; men with a prior malignancy or diagnosis of prostate cancer at autopsy were excluded. Gleason scores, as provided by the SEER program, represent the highest Gleason score identified at surgery or biopsy (for non-surgically managed patients). Stage was determined using the AJCC 6th edition as provided by the SEER program.[22] The inclusion period was limited to 2004–2010, as 2004 represents the year data on many of the covariates of interest became available and 2010 represents the most recent year for which full information is available.

Race was classified as white or African American (AA), as designated by the SEER program.[22] Residence type was determined at the county level by linking to the 2003 United States Department of Agriculture rural–urban continuum codes.[23] Income (computed as median household income) and educational status (computed as the percentage of residents ≥25 years of age with at least a high school education) were also determined at the county level by linking to the 2000 United States Census.[24]

Initial management was defined as receipt of definitive therapy versus no receipt of definitive therapy. Definitive therapy included surgery (radical prostatectomy) or radiation (external beam radiation therapy [EBRT], brachytherapy, or any combination thereof), as classified by the NCCN guidelines.[6]

2.2. Statistical Analyses

The primary outcome measure of this study was the receipt of definitive treatment for patients with high-risk prostate cancer diagnosed from 2004 to 2010. Baseline clinical and demographic characteristics were compared using the t test and χ^2 test, as appropriate. Management type (receipt of definitive therapy [surgery and/or radiation, as defined above under "Patient Population and Study Design"] vs no receipt of definitive therapy) was analyzed stratified by race and age group (age <70 vs age ≥70), with χ^2 pairwise comparison tests made across each race and age group. After adjusting for sociodemographics (age, race, insurance status, residence [urban versus rural], marital status, income, education) and known prostate cancer-specific prognostic factors (PSA, Gleason score, and stage), multivariable logistic regression was used to determine the association between race and the use of definitive treatment. We then evaluated whether there was an interaction between age (age <70 vs age ≥70) and race with respect to the use of definitive treatment via multiplicative multivariable logistic regression