Current Clinical Presentation and Treatment of Localized Prostate Cancer in the United States

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Abbreviations and Acronyms

GS = Gleason score

NCCN = National Comprehensive Cancer Network®

NOS = not otherwise specified

PSA = prostate specific antigen

SEER = Surveillance, Epidemiology and End Results

TURP = transurethral prostate resection

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Purpose: SEER recently released patient Gleason scores at biopsy/transurethral resection of the prostate. For the first time this permits accurate assessment of prostate cancer presentation and treatment according to clinical factors at diagnosis.

Materials and Methods: We used the SEER database to identify men diagnosed with localized prostate cancer in 2010 who were assigned NCCN® risk based on clinical factors. We identified sociodemographic factors associated with high risk disease and analyzed the impact of these factors along with NCCN risk on local treatment.

Results: Of the 42,403 men identified disease was high, intermediate and low risk in 38%, 40% and 22%, respectively. On multivariate analysis patients who were older, nonwhite, unmarried or living in a county with a higher poverty rate were more likely to be diagnosed with high risk disease (each $p < 0.05$). Of the 38,634 men in whom prostate cancer was the first malignancy 23% underwent no local treatment, 40% were treated with prostatectomy, 36% received radiation therapy and 1% underwent local tumor destruction, predominantly cryotherapy. On multivariate analysis patients who were older, black, unmarried or living in a county with a higher poverty rate, or who had low risk disease were less likely to receive local treatment (each $p < 0.05$).

Conclusions: Our analysis provides information on the current clinical presentation and treatment of localized prostate cancer in the United States. Nonwhite and older men living in a county with a higher poverty rate were more likely to be diagnosed with high risk disease and less likely to receive local treatment.

Key Words: prostate, prostatic neoplasms, neoplasm grading, risk, healthcare disparities

The introduction of PSA screening during the last several decades resulted in an increased incidence of prostate cancer such that it is now the leading cancer diagnosis in men in the United State.[1] Moreover, PSA screening has impacted the clinical presentation of prostate cancer with patients now presenting with predominantly localized, low risk disease.[2,3] Nonetheless, accurate information is lacking on the current risk profile of patients with localized prostate cancer in the United States. Previous studies of the risk profile of patients with localized prostate cancer were limited by an inadequate number of patients and/or insufficient information on clinical prognostic factors used to risk stratify patients.

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Understanding prostate cancer risk groups is important since they are used to guide pretreatment evaluations and management recommendations, and predict the likelihood of recurrence after treatment.

In 2013 the NCI (National Cancer Institute) SEER cancer registry released prostate cancer data that for the first time separately reported the individual patient clinical GS at biopsy/TURP.[4] Although the SEER database has captured the individual patient GS since 2004, before 2010 only pathological GS (ie GS at prostatectomy) was reported for those who underwent surgery. Clinical GS along with the previously available clinical (c) tumor (T) stage and prebiopsy/treatment PSA is required to accurately risk stratify patients based on clinical factors at presentation. Because the SEER database captures information on approximately 28% of the American population, this provides a unique opportunity to study risk strata at diagnosis across sociodemographic groups and treatment selection according to clinical factors at diagnosis.

We present updated data on the current clinical presentation and treatment of localized prostate cancer in the United States. We hypothesized that disease extent and treatment would vary across sociodemographic groups.

METHODS

The SEER database [SEER 18 Regs Research Data + Hurricane Katrina Impacted Louisiana Cases, Nov 2012 Sub (1973-2010 varying)] (http://seer.cancer.gov/data/seerstat/nov2012/) was queried using SEER*Stat, version 8.0.4 to identify men 20 years old or older who were diagnosed in 2010 with microscopically confirmed prostate adenocarcinoma (ICD-O-3 morphology code 8140). Because all patient information in the SEER database is de-identified, this study was exempt from institutional review board evaluation.

Data on age at diagnosis, race, marital status, SEER registry, county poverty level in 2000 (the most recent data available), clinical T stage from clinical extension coding, N stage, M stage, GS on needle core biopsy/TURP and prebiopsy/treatment PSA were extracted on all patients. Cases were classified as localized (N0, M0), regional (N1, M0) or metastatic (M1) disease based on TNM stages at diagnosis. Localized prostate cancer cases were further categorized as low risk—less than cT2a, GS less than 6 and PSA less than 10 ng/ml, intermediate risk—cT2b-c or GS 7 or PSA 10 to 20 ng/ml, or high risk—greater than cT3, GS greater than 8 or PSA greater than 20 ng/ml based on the NCCN stratification scheme.[1] Patients with unknown T stage, GS or PSA were otherwise not risk stratified unless they had at least 1 high risk factor. Men with cT2 NOS were classified based on GS and PSA alone, a method that was reliable in a recent study.[5] Given the limited number of patients from Alaska and rural Georgia, these men were combined with those from Hawaii and greater Georgia, respectively.

We determined local treatment in patients with localized prostate cancer in whom prostate cancer was the first or only malignancy. The types of local treatment included no local treatment with or without TURP, prostatectomy, external beam radiation, brachytherapy, combination external beam radiation and brachytherapy, radiation NOS, cryotherapy, high intensity focused ultrasound, laser therapy, hyperthermia and other methods of local tumor destruction. For purposes of analysis we used certain categorizations of local treatment, including none (no local treatment with or without TURP), prostatectomy (with or without postoperative external beam radiation), radiation therapy (external beam radiation, brachytherapy, combination external beam radiation and brachytherapy or radiation NOS) and local tumor destruction (cryotherapy, high intensity focused ultrasound, laser therapy, hyperthermia and other methods of local tumor destruction).

We calculated the proportion of men classified with low, intermediate and high NCCN risk as well as the proportion who underwent no local treatment, prostatectomy, radiation therapy and local tumor destruction according to the available demographic information. Chi-square analysis was used to determine significant differences among patient groups. We performed multivariate logistic regression analysis including all available patient demographic information to determine predictors of high risk disease. Moreover, we performed multivariate logistic regression analysis including all available patient demographic information along with NCCN risk category to determine predictors of no local treatment in all patients as well as in patient subsets according to NCCN risk. Sensitivity analysis was done excluding patients classified with cT2 NOS disease and those at high risk with missing T stage, GS or PSA to verify multivariate analysis conclusions. All statistical analysis was performed at the 0.05 level of significance with SAS®, version 9.3.

RESULTS

We identified 54,537 men diagnosed with prostate adenocarcinoma in 2010, of whom 48,978 (90%) had localized disease, 2,655 (5%) had nodal or distant metastasis and 2,904 (5%) could not be classified. Supplementary table 1 (http://jurology.com/) lists the characteristics of the 42,403 men, including 87% of those with localized disease, who had sufficient information available to be assigned NCCN risk. The remaining 12,134 patients (13%) with localized disease had insufficient information to be assigned NCCN risk.

Median age at diagnosis was 65 years. Of the men 29,266 (69%) were white, 6,291 (15%) were black, 3,400 (8%) were Hispanic, 1,884 were Asian/Pacific Islander (4%) and 143 (0.3%) were Native American. Risk was low, intermediate and high in 16,171 (38%), 16,990 (40%) and 9,242 patients (22%), respectively. There was significant variation in