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Association between American Urologic Association (AUA) urinary symptom score and disease stage in men with localized prostate cancer

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Abstract

We assessed the relationship of American Urological Association (AUA) urinary symptom score and tumor stage in men treated for localized prostate cancer. Methods: Participants in our study were found through urology and radiation oncology clinics, and all eligible patients were asked to take part. All patients had been initially diagnosed on the basis of rising PSA or abnormal physical examination. Histological confirmation of diagnosis was obtained for all subjects. Tumor stage was determined by digital rectal examination. 265 men with prostate cancer were studied. Results: There was a significant difference in AUA symptom score in the three disease stages ($p=0.035$, one way anova). Tukey's multiple range B test showed a significant difference between the AUA symptom scores of patients with t3 disease, when compared to patients with t1 and t2 disease ($p=0.05$). The range test showed no significant difference between the AUA symptom scores of patients with t1 and t2 disease ($p=0.897$). There was a significant difference in mean age of men with t1, t2, and t3 disease ($p<0.001$). Men with t2 disease had a mean age of 69 years, as opposed to men with t1 and t3 disease (mean ages 66 and 64, respectively). Tukey's multiple range B test showed a significant difference ($p=0.05$) between the ages of the men with t2 disease and the men with t1 or t3 disease. But there was no significant difference between the ages of the men with t1 and t3 disease. There was no relationship between age and AUA symptom score ($r=0.008$, $P=0.89$). The AUA symptom score index classifies the symptoms of men with a score of 0 to 7 as mild, 8 to 19 moderate, and 20 and above as severe. According to this classification, 55.6% of the prostate cancer patients we studied had mild symptoms, 37.1% had intermediate symptoms, and 7.3% had severe symptoms. Conclusions: The majority (~80%) of prostate cancers are found in the peripheral zone. But prostate cancers associated with urinary symptoms might arise in the periurethral transition zone, where almost all symptomatic benign prostatic hypertrophy originates. We hypothesize that symptomatic and non-symptomatic prostate cancer may be two distinct disease entities, each with its own characteristic genetic complement. In addition, urologists are actively seeking additional indicators of prostate cancer aggressiveness. Many prostate cancers are quite indolent and may never cause a problem, but it is impossible to identify such tumors with certainty. Further studies of AUA symptom score and outcome would be worthwhile. If AUA symptom score is a predictor of outcome that is independent of t stage, AUA score might be clinically valuable in disease management.

Keywords: Keywords: AUA symptom score; Localized prostate cancer; t stage; Peripheral zone

1. Introduction

PSA, Gleason score, and stage at diagnosis are currently the most reliable markers of prostate cancer prognosis and tumor aggressiveness [1]. Recently, visual estimate of the percentage of carcinoma was shown to be an independent predictor of prostate carcinoma recurrence after radical prostatectomy [2]. But urologists are actively seeking additional markers. We report here that the American Urological Association (AUA) Urinary Symptom Score [3] is associated with disease stage and might be a predictor of outcome.

2. Methods

Participants in our study were found through urology and radiation oncology clinics, and all eligible patients were asked to take part. All patients had been initially diagnosed on the basis of rising PSA or abnormal physical examination. Histological confirmation of diagnosis was obtained for all subjects. All participants gave informed consent. All staging was by digital rectal exam, because almost all the patients were to receive I-125 seed implants.

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We studied 265 men referred for treatment of localized prostate cancer. Pre-treatment urinary symptoms were assessed with the American Urologic Association Symptom Index [3]. We analyzed only t stage (i.e., t1, t2, t3) and not the sub-stages (i.e., a, b, c), because t stage is less ambiguous clinically than sub-stage. Stage t1 (microscopic tumor confined to prostate; gland feels normal), stage t2 (palpable tumor confined to prostate gland), and stage t3 (tumor that has begun to expand beyond the prostate) are more readily apparent on digital exam than the a,b,c sub-stages.

3. Results

The youngest patient was 46, the oldest 84, average age 67. One hundred and one patients were stage t1, 141 were stage t2, and 23 were stage t3. There was a significant difference in AUA symptom score in the three disease stages ($p=0.035$, one way anova, Fig. 1). Tukey's multiple range B test showed a significant difference between the AUA symptom scores of patients with t3 disease, when compared to patients with t1 and t2 disease ($p=0.05$). The range test showed no significant difference between the AUA symptom scores of patients with t1 and t2 disease ($p=0.897$).

There was a significant difference in mean age of men with t1, t2, and t3 disease ($p<0.001$, one way anova, Fig. 2). Men with t2 disease had a mean age of 69 years, as opposed to men with t1 and t3 disease (mean ages 66 and 64, respectively). Tukey's multiple range B test showed a significant difference ($p=0.05$) between the ages of the men with t2 disease and the men with t1 or t3 disease. But there was no significant difference between the ages of the men with t1 and t3 disease. There was no relationship between age and AUA symptom score ($r=0.008$, $P=0.89$).

The AUA symptom score index classifies the symptoms of men with a score of 0 to 7 as mild, 8 to 19 as moderate, 20 and above as severe [4]. According to this classification, 55.6% of the prostate cancer patients we studied had mild symptoms, 37.1% had intermediate symptoms, and 7.3% had severe symptoms.

4. Discussion

The American Urological Association (AUA) Urinary Symptom Index for benign prostatic hypertrophy (BPH) was developed and validated by a multidisciplinary measurement committee of the American Urological Association. The AUA symptom score includes 7 questions covering frequency, nocturia, weak urinary stream, hesitancy, intermittence, incomplete emptying and urgency. The index is internally consistent and the score generated has excellent test-retest reliability. Scores are highly correlated with subjects' global ratings of the magnitude of their urinary problem and powerfully discrimi-

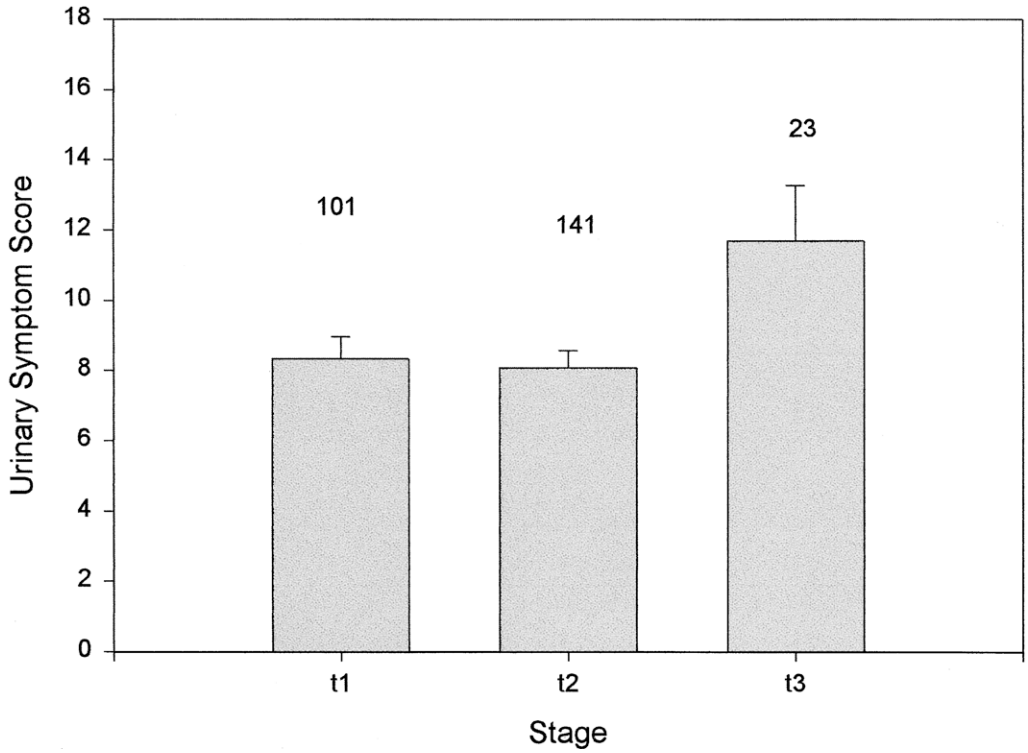

Fig. 1. AUA Urinary Symptom score (mean + SEM) in 265 prostate cancer patients, stratified by disease stage. Number of cases in each group is indicated above corresponding error bar. There is a significant difference in AUA Urinary Symptom Score in the three disease stages ($p=0.035$, one way anova). Tukey's multiple range B test showed a significant difference between the AUA symptom scores of patients with t3 disease, when compared to patients with t1 and t2 disease ($p= 0.05$). The range test showed no significant difference between the AUA symptom scores of patients with t1 and t2 disease ($p=0.897$).

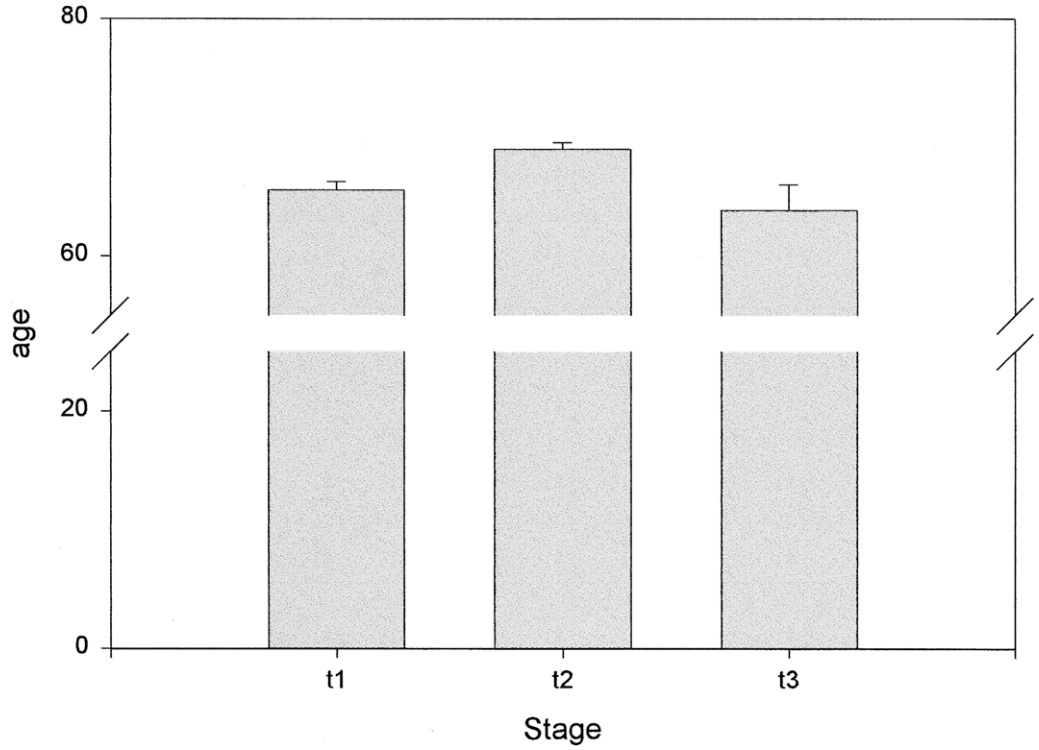

Fig. 2. Ages of 265 prostate cancer patients (mean+SEM) stratified by disease stage, showing a significant difference in the ages of the three groups ($p<0.001$, one way anova). Men with t2 disease had a mean age of 69 years, as opposed to men with t1 and t3 disease (mean ages 66 and 64, respectively). Tukey's multiple range B test showed a significant difference ($p=0.05$) between the ages of the men with t2 disease, as opposed to the men with t1 and t3 disease. But there was no significant difference between the ages of the men with t1 and t3 disease.

nate between BPH and control subjects. The score is also sensitive to change in BPH, with preoperative scores decreasing from a mean of 17.6 to 7.1 by four weeks after prostatectomy.

Soontrapa et al. [5] have reported the association of advanced prostate cancer with urinary symptoms. These investigators did not use the AUA Index or another validated instrument to evaluate symptom severity or extent.

The majority (~80%) of prostate cancers are found in the peripheral zone [6]. But prostate cancers associated with urinary symptoms might arise in the periurethral transition zone, where almost all symptomatic BPH originates. We hypothesize that symptomatic and non-symptomatic prostate cancer may be two distinct disease entities, each with its own characteristic genetic complement. The separation between the two entities is made less distinct by the presence of BPH, a condition unrelated to the development of prostate cancer [7,8]. Yet the fact that only 7.3% of our patients had severe symptoms accords with the observation that most prostate cancers are found in the peripheral zone.

Urologists are actively seeking additional biomarkers of prostate cancer aggressiveness. Many prostate cancers are quite indolent and may never cause a problem, but it is impossible to identify such tumors with certainty. Further studies of AUA symptom score and outcome would be worthwhile. If AUA symptom score is a predictor of outcome that is independent of t stage, AUA score might be clinically valuable in disease management. With more and better outcome predictors, many older men might be spared the rigors of radiation therapy and/or surgery, and the complications.

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