Worse Urinary, Sexual and Bowel Function Cause Emotional Distress and Vice Versa in Men Treated for Prostate Cancer

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Abbreviations and Acronyms

AJCC = American Joint Committee on Cancer

PCa = prostate cancer

PSA = prostate specific antigen

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Purpose: Definitive therapy for prostate cancer (eg surgery or radiotherapy) often has side effects, including urinary, sexual and bowel dysfunction. The purpose of this study was to test whether urinary, sexual and bowel functions contribute to emotional distress during the first 2 years after treatment and whether distress may in turn decrease function.

Materials and Methods: The study participants were 1,148 men diagnosed with clinically localized disease who were treated with surgery (63%) or radiotherapy (37%). Urinary, sexual and bowel functions were assessed with EPIC (Expanded Prostate Cancer Index Composite). Emotional distress was assessed with the NCCN® (National Comprehensive Cancer Network®) Distress Thermometer. Assessment time points were before treatment, and 6 weeks, and 6, 12, 18 and 24 months after treatment. We used time lagged multilevel models to test whether physical function predicted emotional distress and vice versa.

Results: Men with worse urinary, bowel and sexual functions reported more emotional distress than others at subsequent time points. The relationships were bidirectional. Men who reported worse distress also reported worse urinary, bowel and sexual functions at subsequent time points.

Conclusions: Clinicians supported by practice and payer policies should screen for and facilitate the treatment of side effects and heightened emotional distress to improve well-being in survivors of prostate cancer. These interventions may be cost-effective, given that emotional distress can negatively impact functioning across life domains.

Key Words: prostatic neoplasms; stress, psychological; sexual dysfunction, physiological; urination disorders; quality of life

Patients with cancer frequently experience emotional distress, not only when they are diagnosed and during treatment but also into long-term survivorship.[1,2] Mental health issues have substantial human, medical care and other financial costs,[3,4] and interventions to reduce emotional distress in patients with cancer have been associated with decreases in care and cost savings.[5,6] Although with time emotional distress decreases in most patients with PCa, some tend to have high anxiety that does not decline to the level in the general population.[7]

Most of the 2.8 million survivors of PCa in the United States have been treated with definitive therapy, typically surgery or radiotherapy. Men treated surgically often experience some degree of urinary

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incontinence, especially in year 1 after treatment, and most experience erectile dysfunction even 2 years postoperatively.[8] External beam radiation and brachytherapy are associated with erectile dysfunction, and bowel pain and urgency.[8,9] To understand the magnitude of the impact of treatment side effects on the lives of men, it is important to consider the impact of these side effects on emotional distress in patients with PCa treated with definitive therapy.

In a cross-sectional study of Irish survivors of PCa worse urinary function was associated with depression, anxiety and distress, and worse bowel function was associated with greater anxiety and distress.[10] Sexual function was not associated with any psychological well-being outcome. However, in an American sample greater erectile dysfunction was associated with greater depression among survivors.[11] In studies of general population samples erectile dysfunction was associated with emotional distress.[12] Rather than conceptualizing distress as the result of decreased function, in a third study it was hypothesized that psychological distress causes function declines with time.[13] The investigators found that depression and anxiety were associated with downward trends in sexual function during the 3 years after diagnosis.

The purpose of our study was to evaluate whether urinary, bowel and sexual functions affect distress and also test whether distress influences function. Our study was prospective, controlling for baseline distress and function, and men were assessed at regular intervals for the 2 years following treatment. We assessed emotional distress as well as urinary, sexual and bowel functions prior to treatment (baseline) and at 6 weeks, and 6, 12, 18 and 24 months after treatment in men who had been treated with surgery or radiotherapy (external beam radiation, brachytherapy, external beam radiation and brachytherapy or proton therapy).

METHODS

Data Source and Procedure

We used data from the Live Well Live Long! study, a prospective, multisite study of men diagnosed with clinically localized PCa. Men were recruited at or shortly after diagnosis and prior to treatment from 2 comprehensive cancer centers and 3 large group practices between 2010 and 2014. We approached 3,337 patients, of whom 2,476 were consented and 2,008 completed a baseline survey prior to treatment. We surveyed 1,679 men again 6 weeks postoperatively, and 1,638 at 6 months, 1,580 at 12 months, 1,394 at 18 months and 1,184 at 24 months. We abstracted clinical information on 1,946 men from post-treatment medical records. Data were used on 1,148 men who had available baseline data and data from at least 1 followup time point, and who had been treated with surgery or radiotherapy.

The men who completed a baseline questionnaire but were not included in multivariable models were more likely to be black than white (0.67, 95% CI 0.36–0.98, $p < 0.001$) and unmarried (−0.60, 95% CI −0.90−−0.31, $p < 0.001$), and have a lower educational attainment (−0.43, 95% CI−0.77−−0.08), lower income (−0.59, 95% CI −0.84−−0.35, $p<0.001$), worse baseline urinary function (−1.78, 95% CI 3.27−−0.30, $p = 0.019$) and worse sexual function (−3.49, 95% CI = −6.96−−0.02, $p = 0.049$).

Measures

Urinary, sexual and bowel functions were assessed with the EPIC-50 function items.[14] These items assess the frequency of being affected by a treatment related side effect during the previous 4 weeks. Scores range from 0 to 100 with higher scores indicating better function. Function variables were handled differently depending on how they were used. If they were treated as outcomes, we used raw scores. Following the recommendations by Bolger and Laurenceau,[15] function predictor variables were separated into within person and between person components.

Emotional distress was assessed with the NCCN Distress Thermometer, an 11-point 1-item visual analog scale ranging from 0—no distress to 10—extreme distress. The Distress Thermometer has been validated and it is a recommended distress screening tool in patients with PCa[16,17] with good specificity and sensitivity for detecting cancer specific distress.[18] When treated as an outcome, we used raw scores. When treated as a predictor, we calculated within person and between person components using the same method as that used for function scores.

We controlled for baseline emotional distress, and urinary, sexual and bowel functions in all models. Models were trimmed to include only additional covariates that were significantly associated with the outcome. In the untrimmed models we controlled for the type of treatment received (surgery vs radiotherapy), whether participants also received androgen deprivation therapy and the D'Amico disease risk (unpublished data). Low risk PCa was defined as clinical stage PSA 10 ng/ml or less, Gleason score 6 or less and AJCC less than cT2b.[19] Intermediate risk PCa was defined as PSA greater than 10 and 20 ng/ml or less, Gleason 7 disease or AJCC cT2b. High risk disease was defined as PSA greater than 20 ng/ml, Gleason 8-10 disease, or AJCC cT2c or higher.[19]

The demographic covariates were self-reported race/ethnicity (nonHispanic white, nonHispanic black and Hispanic, referred to as white, black and Hispanic, respectively), education attainment (a 14-level continuous variable ranging from having completed first grade to graduate school year 4), income (a 9-level variable ranging from less than $5,000 to $100,000 or greater) and patient age.

It is possible that side effects could be interpreted as signs of disease progression, in turn causing distress, rather than side effects directly causing distress. To rule out this possibility we controlled for confidence in cancer