THE JOURNAL OF
SEXUAL MEDICINE

Prevalence and Predicting Factors for Commonly Neglected Sexual Side Effects to External-Beam Radiation Therapy for Prostate Cancer

Anders Frey, MD,[1] Christian Pedersen, MD,[3] Henriette Lindberg, MD, PhD,[2] Rasmus Bisbjerg, MD,[1] Jens Sønksen, MD, DMSci,[1] and Mikkel Fode, MD, PhD, FEMSM[1,3]

ABSTRACT

Introduction: Changes in sexual function other than erectile dysfunction are sparsely investigated after radiation therapy for prostate cancer.

Aim: To investigate orgasmic dysfunction, urinary incontinence during sexual activity, changes in penile morphology, and sensory disturbances in the penis in patients with prostate cancer treated with external-beam radiation therapy (EBRT).

Methods: In February 2015, men treated with EBRT at our center 3 months to 5 years previously (N = 519) received a study-specific questionnaire. This was developed from purpose-built questions and validated tools including the Erection Hardness Scale. All patients had received a radiation dose of 78 Gy. Androgen deprivation therapy was administered according to disease characteristics.

Main Outcome Measures: Outcome measurements were prevalence rates and predictors of these side effects as identified by multivariate logistic regression analyses.

Results: One hundred nine patients were eligible (sexually active and had completed androgen deprivation therapy) for inclusion. Twenty-four percent reported anorgasmia, 44% reported a decreased intensity of their orgasms, and 40% reported that the time it took to reach orgasm had increased. Eleven percent reported anejaculation. Fifteen percent reported orgasm-associated pain. Only 4% reported urinary incontinence during sexual activity. Subjective penile length loss in excess of 1 cm was reported by 42%. Twelve percent reported an altered curvature of their penis after EBRT. Six percent reported painful erections. Twenty-seven percent reported decreased sensitivity in the penis after EBRT, 2% reported a cold sensation, and 2% reported paresthesia. Increasing time since final treatment increased the risk of penile sensory disturbances (odds ratio = 1.05; $P = .028$).

Conclusion: Orgasmic dysfunction, changes in penile morphology, and sensory disturbances in the penis are common side effects of ERBT. Patients should be properly informed of the occurrence of these side effects before deciding which treatment to pursue. **Frey A, Pedersen C, Lindberg H, et al. Prevalence and Predicting Factors for Commonly Neglected Sexual Side Effects to External-Beam Radiation Therapy for Prostate Cancer. J Sex Med 2017;XX:XXX–XXX.**

Key Words: Prostate Cancer; Sexual Dysfunction; Penile Shortening; External-Beam Radiation Therapy; Orgasm; Climacturia

INTRODUCTION

Common treatment options for localized prostate cancer include radical prostatectomy (RP) and external-beam radiation therapy (EBRT).[1] In intermediate- and high-risk cancers, EBRT is often combined with androgen deprivation therapy (ADT).[2,3] Surgery and EBRT are generally considered equivalent for cancer control.[4] However, these treatments also are associated with side effects, most notably in the form of erectile dysfunction (ED) and urinary problems.[5–8] In recent years, RP has been documented to cause altered perception of orgasm, orgasm-associated pain (OAP), urinary incontinence during sexual activity (UIS), altered penile morphology, and sensory disturbances in the penis.[9] However, only few studies have investigated the occurrence of these side effects after EBRT and more knowledge is needed on the topic. This is especially important because patients are often faced with a choice between treatment options largely based on the expected side effects.

Received August 31, 2016. Accepted January 18, 2017.

[1]Department of Urology, Herlev and Gentofte Hospital, Herlev, Denmark;
[2]Department of Oncology, Herlev and Gentofte Hospital, Herlev, Denmark;
[3]Department of Urology, Zealand University Hospital, Roskilde, Denmark

http://dx.doi.org/10.1016/j.jsxm.2017.01.015

AIMS

The aims of this study were to investigate the prevalence of altered perception of orgasm, OAP, anejaculation, UIS, self-perceived altered penile morphology, and sensory disturbances in the penis after EBRT for prostate cancer and to identify possible risk factors for these problems.

METHODS

This study was part of a comprehensive single-center, cross-sectional, questionnaire-based investigation in patients after EBRT conducted from May through November 2015. The main objective was to identify the EBRT side effects described earlier. The study was approved by the Danish Data Protection Agency (ID HEH-2014-091) and was registered at www.clinicaltrials.gov (ID NCT02274350). Informed consent was obtained as part of the questionnaire.

Patients who underwent EBRT at our center were identified from hospital records. Those who had completed the treatment 3 months to 5 years before study initiation were eligible for inclusion. All patients received a total radiation dose of 78 Gy and ADT was administered on an individualized basis. ADT was performed according to a paradigm in which patients with low and intermediate risk would not receive ADT and those with high risk would receive ADT starting 3 months before EBRT and continuing up to 3 years. However, in a few cases, the treating oncologist chose to administer ADT to patients with intermediate risk. Subjects were excluded if they had received other treatments for prostate cancer. For this analysis, patients who had not finished their ADT were excluded. In addition, patients who were not sexually active (by masturbation and/or intercourse) were excluded.

A study-specific questionnaire was developed from a combination of validated questionnaires and single questions. This included questions on demographics and comorbidities. For assessment of sexual side effects, we included the Erection Hardness Scale (EHS)[10] and a series of questions on perception of orgasm, UIS, changes in penile morphology, and sensory disturbances in the penis, which were previously described and validated in a study on the effects of RP.[11] The International Consultation on Incontinence Questionnaire Short Form (ICIQ-SF)[12] was used to assess urinary function. The complete questionnaire was tested for face validity by 10 face-to-face interviews with patients after EBRT.

Eligible patients received the questionnaire in May 2015. Then, 1 month later, non-responders received an identical questionnaire, which served as a reminder. Information on disease characteristics and the duration and timing of EBRT and ADT were extracted from medical records of all participants. Patients were stratified according to the risk classification of D'Amico et al.[13]

Descriptive statistics were performed, and because the data were not normally distributed, non-parametric statistics were applied for identification of possible risk factors. If multiple covariates were found to be predictive for a given side effect, then they were combined in a multivariate logistic regression analysis. For statistical strength in the logistic regression analyses, various outcomes were pooled. Altered perception of orgasm was defined as increased time to climax, decreased orgasm intensity, anorgasmia, or any combination of the three. OAP was considered clinically significant when experienced at least a few times after EBRT. For UIS, patients were asked to differentiate a loss of urine during climax from other parts of the sexual interaction. However, for the logistic regression analyses, UIS was defined as the leakage of urine at least a few times in the period after EBRT during sexual activity in general. Penile shortening was considered clinically meaningful when patients reported having lost more than 1 cm of penile length. All penile sensory disturbances were pooled. ED was defined as an EHS score no higher than 2, because a score of 3 is the lowest degree of erectile hardness that allows penetration. Because only two patients were in the low-risk group, tumor stage was used in the analyses to increase power.

Outcomes of logistic regression analyses were calculated as odds ratios, 95% CIs, and *P* values. Two-sided *P* values less than 0.05 were considered statistically significant. All statistical analyses were performed with R statistical software (R Foundation for Statistical Computing, 2013).[14] Logistic analyses were fitted by the generalized linear model function.

MAIN OUTCOME MEASURES

The main outcome measurements were the prevalence rates of altered perception of orgasm, OAP, anejaculation, UIS, self-perceived alterations in penile morphology, and sensory disturbances in the penis. Secondary outcome measurements were predictors of these side effects as identified by multivariate logistic regression analyses.

RESULTS

One hundred nine sexually active patients were included in the analyses. Figure 1 presents details on the inclusion process. The median age of the included patients was 71 years (range = 57−81), and the median time since final EBRT treatment was 50 months (range = 4−71). Demographics are presented in Table 1. Overall 54 participants (50%) were categorized as having ED at the time of the survey. The median ICIQ-SF score was 0 (range = 0−16).

Twenty-six patients (24%) reported anorgasmia and 48 (44%) reported a decreased intensity of their orgasms. Thirty-two patients (29%) perceived their orgasms to be of the same intensity as before the treatment and two patients (2%) reported an increased intensity of their orgasms. Forty-four patients (40%) reported that the time it took to reach orgasm had increased, 25 patients (23%) reported that it took the same amount of time, and 13 (12%) reported that the time to orgasm had decreased.