Support Care Cancer (2011) 19:161–165
DOI 10.1007/s00520-010-1000-0

SHORT COMMUNICATION

Sexual concerns in lung cancer patients: an examination of predictors and moderating effects of age and gender

Jennifer Barsky Reese · Rebecca A. Shelby · Amy P. Abernethy

Received: 13 June 2010 / Accepted: 23 August 2010 / Published online: 4 September 2010

Abstract
Purpose Sexual concerns are understudied and undertreated for patients with lung cancer. Objectives were to: (1) assess sexual concerns in lung cancer patients and examine differences by age and gender; (2) examine stability of sexual concerns over time; and (3) evaluate whether sexual concerns in lung cancer patients are significantly related to physical and emotional symptoms.
Materials and methods Data were collected from lung cancer patients during four outpatient clinic visits over 6 months. Measures included sexual concerns (reduced sexual enjoyment, interest, or performance), fatigue (FACIT Fatigue Scale), shortness of breath, and emotional distress (acute distress, despair; Patient Care Monitor). Linear mixed model analyses were conducted.
Results Sexual concerns were common, with 52% of patients reporting at least mild sexual concerns and were stable. Sexual concerns were significantly associated with physical and emotional symptoms; particularly strong relationships were found between sexual concerns and shortness of breath and emotional distress. Age moderated the relationship between both fatigue and shortness of breath and sexual concerns; gender moderated the relationship between emotional distress and sexual concerns.
Conclusions Self-reported sexual concerns are common in people with lung cancer, are stable, and are related significantly to physical and emotional symptoms; age and gender influence the distress associated with sexual symptoms in this population. Better attention to patient concerns, treatment, and more research are clearly needed.

Keywords Lung cancer · Sexuality · Quality of life · Sexual dysfunction · Physiological

J. B. Reese (✉)
Department of Psychiatry and Behavioral Sciences,
Johns Hopkins University School of Medicine,
5510 Nathan Shock Dr. Suite 100,
Baltimore, MD 21224, USA
e-mail: jreese13@jhmi.edu

R. A. Shelby
Department of Psychiatry & Behavioral Sciences,
Duke University Medical Center (DUMC),
Durham, NC, USA

A. P. Abernethy
Department of Medicine, Division of Medical Oncology,
Duke University Medical Center (DUMC),
Durham, NC, USA

A. P. Abernethy
Duke Comprehensive Cancer Center, DUMC,
Durham, NC, USA

Sexual distress may be an important component of quality of life in lung cancer, but it is infrequently studied and discussed. Data suggest that up to 95% of lung cancer patients score below the 50th percentile on function [13]. Impact on sexual function is distressing to most lung cancer patients [12], and sexual concerns have been found to be related to both higher symptom distress [11] and worse functional status in lung cancer patients. These findings suggest the importance of studying sexual concerns in the lung cancer population.

Research examining sexual concerns in lung cancer is limited. First, with few exceptions [13], studies have not examined potential age or gender differences in sexual concerns for lung cancer patients. Second, longitudinal designs have not been adequately utilized to examine stability of sexual concerns over time [13]. Third, studies have not generally examined how sexual concerns are

related to particular physical and emotional symptoms, such as shortness of breath, fatigue, or emotional distress. This could provide valuable information about the possible contributors to sexual problems in this population.

Given the gaps in current literature and the potential importance of sexual concerns to lung cancer patients, the current study had the following aims: (a) to assess the prevalence of sexual concerns in a sample of lung cancer patients and to examine differences by age and gender; (b) to examine stability of sexual concerns over time; and (c) to evaluate the relationship between sexual concerns and physical and emotional symptoms (i.e., fatigue, shortness of breath, and emotional distress) in this cohort, including stability of these relationships over time.

Materials and methods

Participants

Eligible participants were recruited through the Duke University Medical Center cancer clinics and included English-speaking adults aged 18 and older with a pathologic diagnosis of stage IV non-small cell lung cancer and adequate cognitive ability to complete questionnaires. The parent studies collected patient-reported information that described the experiences of patients with advanced lung cancer and therefore aimed to enroll half of participants who were judged by their treatment team to have a life expectancy of <6 months. The final sample included 89 participants with non-small cell lung cancer.

Procedures

The protocol and all procedures were approved by the Duke University Health System Institutional Review Board. Wireless tablet personal computers used to collect survey information in the clinic were used to collect information from participants during four outpatient visits over <6 months [1, 2]. Given the goal of including individuals with advanced lung cancer, people with advanced disease were intentionally included; as a result, there was dropout over time with a goal of having at least 50% of the sample participating in all four time points. For the 89 patients included in this sub-study cohort, 74 participated in a second assessment that occurred on average 4.95 weeks (SD=4.11, range 1–19) after baseline, 62 participated in a third assessment that occurred on average 9.48 weeks (SD=6.06, range 4–26) after baseline, and 53 participated in a fourth assessment that occurred on average 12.00 weeks (SD=4.58, range 6–25) after baseline. Participants were reimbursed $25 per visit.

Measures

Sexual concerns were assessed through an item from the Patient Care Monitor (PCM) inquiring about "problems with reduced sexual enjoyment, interest or performance." Responses to all items from the PCM (including for shortness of breath, acute distress, and despair) are scored on an 11-point scale anchored at 0 (not a problem) and 10 (as bad as possible). All items reference the past week. The PCM has been validated against standard symptom inventories and QOL scales [3, 4]. The sexual concerns item has been used by our group to examine sexual problems in GI cancer and breast cancer samples [10]. The FACIT Fatigue Scale includes 13 items assessing fatigue within a comprehensive compilation of questions assessing health-related QOL in patients with chronic illnesses [15]. Responses are scored on a five-point scale anchored at 0 (not at all) and 4 (very much), with higher scores representing *less* fatigue and *better* quality of life. This scale showed high reliability in the current study (Cronbach's α=0.94). Shortness of breath and emotional distress (acute distress and despair) were assessed through items or scales from the PCM. Higher scores indicate worse symptoms. The Acute Distress Scale includes four items assessing negative affect (e.g., "I cry a lot or feel like crying"). The Despair subscale includes seven items assessing distressed mood and anxiety (e.g., "I have felt helpless"). In the current study, there was adequate reliability for both emotional distress scales (Cronbach's α=0.91 for both scales).

Statistical analyses

Longitudinal linear mixed models were conducted [9] to examine changes in sexual concerns over time and to examine whether the relationships between sexual concerns and domains of functioning differed by age or gender. Time was coded as weeks since baseline assessment. A random effect was included in all models for the intercept. A random effect for slope was not included in the models as there was no random variability in the slope of sexual concerns due to lack of change in this variable over time.

Results

This sample consisted of 89 non-small cell lung cancer patients (58% male, 72% married; mean age=62, SD=9.87; 78% Caucasian, 87% metastatic disease) who were on average 1.42 years (SD=1.82) out from diagnosis.

Baseline sexual concerns

On average, patients reported mild sexual concerns (M=2.19, SD=2.97) at baseline. Based on the following four catego-

ries (0=no concerns; 1–3=mild sexual concerns; 4–6=moderate sexual concerns; 7–10=severe sexual concerns) used in prior research and clinical practice [1], at baseline, 48.3% of patients (n=43) reported no sexual concerns, 27.0% (n=24) reported mild sexual concerns, 11.2% (n=10) reported moderate sexual concerns, and 13.5% (n=12) reported severe sexual concerns.

Stability of sexual concerns over time

Results of linear mixed model (LMM) showed that the time effect was not significant (B=−0.00, SE=0.02, t=−0.11, p=0.91), suggesting that sexual concerns remained stable over time.

Stability of sexual concerns by age and gender

There were no significant effects for time (B=−0.00, SE=0.02, t=−0.04, p=0.97), age (B=−0.03, SE=0.03, t=−0.99, p=0.33) or for the age × time interaction (B=−0.00, SE=0.00, t=−0.30, p=0.76). Sexual concerns did not differ by age at baseline and were equally stable for participants regardless of their age. A significant main effect for gender (B=−1.52, SE=.58, t=−2.62, p=0.01) indicated that males reported more severe sexual concerns than females at baseline. The effects for time (B=−0.01, SE=0.03, t=−0.45, p=0.66) and for the time × gender effect (B=0.02, SE=0.04, t=0.52, p=0.60) were not significant, showing that sexual concerns were equally stable for males and females.

Relationships between physical and emotional symptoms and sexual concerns

We used LMM [9] to examine whether age or gender moderated the relationships between sexual concerns and fatigue, shortness of breath, acute distress, and despair. First, we examined age as a potential moderator. In all models, the fixed effects for time, age, and time × age were not significant (p>0.28). In the model for fatigue, the main effect for fatigue was not significant (p=0.24), but the age × fatigue interaction term was significant (B=0.00, SE=0.00, t=2.08, p=0.04). This interaction indicated that for younger participants, as fatigue increased, sexual concerns also increased, while for older participants, sexual concerns did not differ by level of fatigue.

For shortness of breath, there was a significant main effect (B=0.22, SE=0.07, t=3.32, p=0.001), indicating that worse shortness of breath was associated with worse sexual concerns. The shortness of breath × age interaction was also significant (B=−0.02, SE=0.01, t=−2.18, p=0.03), showing that for younger participants, as shortness of breath increased, sexual concerns also increased, while for older participants, sexual concerns did not differ by degree of shortness of breath (see Fig. 1).

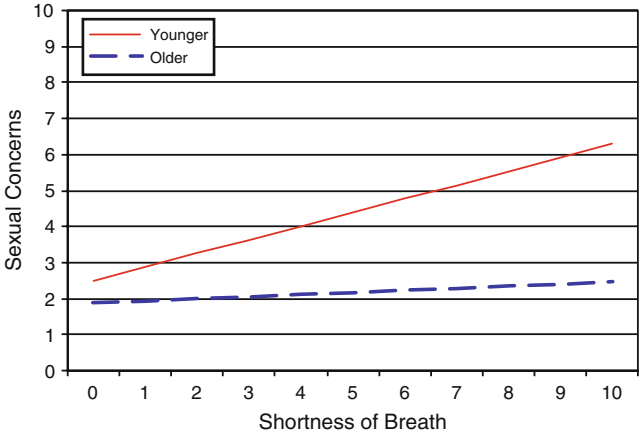

Fig. 1 Sexual concerns and shortness of breath by age

For acute distress, there was a trend for a significant main effect (B=0.05, SE=0.03, t=1.74, p=0.08), with worse acute distress being associated with worse sexual concerns. There was also a trend for the acute distress × age interaction term (B=0.01, SE=0.00, t=1.84, p=0.07), indicating that for older patients, as distress increased, sexual concerns also increased, while no such relationship was found for younger patients. Finally, for emotional despair, only the main effect was significant (B=0.05, SE=0.02, t=2.20, p=0.03), indicating that worse despair was associated with worse sexual concerns.

Next, we examined gender as a potential moderator. In all models, there was a significant main effect for gender (p<0.05), but the effects for time and time × gender were not significant (p>0.53). For fatigue, neither the main effect nor the fatigue × gender interaction term was significant (p>0.26). For shortness of breath, the main effect was significant (B=0.25, SE=0.08, t=2.91, p=0.004), but the shortness of breath × gender interaction was not significant (p=0.44).

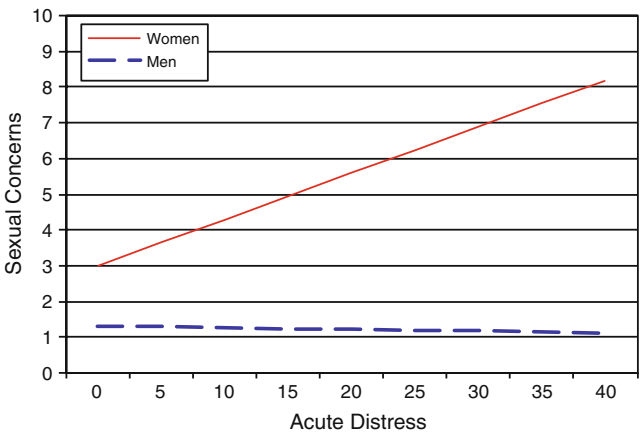

Fig. 2 Sexual concerns and acute distress by gender

For acute distress, there was a significant main effect (B=0.13, SE=0.04, t=2.92, p=0.004) and a significant distress × gender interaction (B=−0.13, SE=0.06, t=−2.39, p=0.02), suggesting that for females, as distress increased, sexual concerns also increased, while for males, sexual concerns did not differ by level of acute distress (see Fig. 2). A similar pattern of results was found for despair. There was a significant main effect (B=0.09, SE=0.03, t=3.14, p=0.002) and a significant despair × gender interaction term (B=−0.08, SE=0.04, t=−1.98, p=0.05), suggesting that for females, as despair increased, sexual concerns also increased, while for males, sexual concerns did not differ by level of despair.

Discussion

Sexual concerns remain relatively understudied and undertreated in cancer. This study demonstrated that self-reported sexual concerns are as prevalent in lung cancer patients as in other groups with cancers directly affecting the sexual organs (i.e., breast, prostate) [5, 7, 8]. Furthermore, results of this and other studies suggest that sexual concerns do not improve for lung cancer patients over time [12, 13]. Given that treatments for lung cancer are often palliative rather than curative, clinicians may assume that sexual concerns are unimportant for this group; our data suggest that sexual concerns are prevalent, persistent, and may be relevant to patients with advanced disease during active treatment. In lung cancer, symptoms and side effects such as shortness of breath, fatigue, and depression appear to be some of the most significant sequelae of disease and its treatment [6, 11, 14]. In this study, worse shortness of breath and emotional distress were significantly related to worse sexual concerns, showing that physical and emotional symptoms of cancer and its treatment may play a particularly important role in sexual concerns for lung cancer patients. However, more research is needed to determine the relative importance of sexual concerns compared with other physical and emotional symptoms for this group.

Results of this study suggest the importance of considering how age and gender may influence sexual concerns for lung cancer patients. Although age was not related to *baseline* level of sexual concerns, age moderated the effect of fatigue and shortness of breath on sexual concerns. Younger patients suffering from worse fatigue and shortness of breath reported worse sexual concerns than those not suffering from these symptoms. Males showed worse sexual concerns than females at baseline, but moderation effects of gender revealed interesting relationships. Gender moderated the effect of emotional distress on sexual concerns; for female patients, as acute distress or despair increased, sexual concerns also increased, while for male patients, sexual concerns did not depend on the degree of emotional distress. Taken together, these findings suggest that age and gender can impact the sexual concerns of lung cancer patients and need to be taken into account when attending to sexual concerns.

This study is limited by use of a single item to assess sexual concerns rather than a validated scale with multiple items, a brief time frame for assessment, study attrition (primarily because of illness), and lack of data on patients' treatment histories. Despite these limitations, findings from this study argue strongly for adequate assessment and treatment of sexual concerns in the routine care of lung cancer patients. Although not all lung cancer patients will have sexual concerns, we argue that the provider should aim to raise this issue rather than assume patients' lack of concern in this area.

Acknowledgments This study is a sub-analysis of data collected within a larger study funded by Kanglaite USA, Inc. The writing of this manuscript was partially supported by American Cancer Society postdoctoral fellowship PF-09-154-01-CPPB awarded to Jennifer Barsky Reese, PhD. The authors have no conflicts of interest to report.

References

1. Abernethy AP, Herndon JE 2nd, Wheeler JL, Patwardhan M, Shaw H, Lyerly HK, Weinfurt K (2008) Improving health care efficiency and quality using tablet personal computers to collect research-quality, patient-reported data. Health Serv Res 43:1975–1991
2. Abernethy AP, Herndon JE II, Wheeler JL, Day JM, Hood L, Patwardhan M, Shaw H, Lyerly HK (2009) Feasibility and acceptability to patients of a longitudinal system for evaluating cancer-related symptoms and quality of life: pilot study of an e/tablet data-collection system in academic oncology. J Pain Symptom Manage 37:1027–1038
3. Abernethy AP, Zafar SY, Uronis H, Wheeler JL, Coan A, Rowe K, Herndon JE (2010) Validation of the patient care monitor (version 2.0), a review of systems assessment instrument for cancer patients. J Pain Symptom Manage. doi:10.1016/j.jpainsymman.2010.01.017
4. Fortner B, Okon T, Schwartzberg L, Tauer K, Houts AC (2003) The cancer care monitor: psychometric content evaluation and pilot testing of a computer administered system for symptom screening and quality of life in adult cancer patients. J Pain Symptom Manage 26:1077–1092
5. Ganz PA, Kwan L, Stanton AL, Krupnick JL, Rowland JH, Meyerowitz BE, Bower JE, Belin TR (2004) Quality of life at the end of primary treatment of breast cancer: first results from the moving beyond cancer randomized trial. J Natl Cancer Inst 96:376–387
6. Hoffman AJ, Given BA, von Eye A, Gift AG, Given CW (2007) Relationships among pain, fatigue, insomnia, and gender in persons with lung cancer. Oncol Nurs Forum 34:785–792
7. Knight SJ, Latini DM (2009) Sexual side effects and prostate cancer treatment decisions: patient information needs and preferences. Cancer J 15:41–44
8. Meyerowitz BE, Desmond KA, Rowland JH, Wyatt GE, Ganz PA (1999) Sexuality following breast cancer. J Sex Marital Ther 25:237–250

9. Raudenbush SB, Bryk AS (2002) Hierarchical linear models: applications and data analysis methods. Sage, Thousand Oaks
10. Reese JB, Shelby R, Keefe FJ, Porter LS, Abernethy AP (2010) Sexual concerns in cancer patients: a comparison of GI and breast cancer patients. Support Care Cancer 18:1179–1189
11. Sarna L (1993) Correlates of symptom distress in women with lung cancer. Cancer Pract 1:21–28
12. Sarna L, Brown JK, Cooley ME, Williams RD, Chernecky C, Padilla G, Danao LL (2005) Quality of life and meaning of illness of women with lung cancer. Oncol Nurs Forum 32: E9–E19
13. Shell JA, Carolan M, Zhang Y, Meneses KD (2008) The longitudinal effects of cancer treatment on sexuality in individuals with lung cancer. Oncol Nurs Forum 35:73–79
14. Smith EL, Hann DM, Ahles TA, Furstenberg CT, Mitchell TA, Meyer L, Maurer LH, Rigas J, Hammond S (2001) Dyspnea, anxiety, body consciousness, and quality of life in patients with lung cancer. J Pain Symptom Manage 21:323–329
15. Yellen SB, Cella DF, Webster K, Blendowski C, Kaplan E (1997) Measuring fatigue and other anemia-related symptoms with the Functional Assessment of Cancer Therapy (FACT) measurement system. J Pain Symptom Manage 13:63–74