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Survey article

The association of sexual dysfunction with race in women with gynecologic malignancies

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A B S T R A C T

Gynecologic cancer survivors report sexual health among their highest concerns. The aim of this study was to identify the prevalence of sexual dysfunction (SD) in survivors of gynecologic malignancies and to evaluate the association of sexual function with race, ethnicity and treatment modality. In this study, survivors of endometrial, cervical, vaginal, and vulvar cancer who presented to the gynecologic oncology practice were asked to self-administer the Female Sexual Function Index (FSFI) survey to evaluate their sexual function. The prevalence of SD was estimated and its association with demographic and clinical co-variates was analyzed. Of the 155 participants, the prevalence of SD was 44.5% (95%CI: 36.7–52.7). Patients were significantly more likely to report SD if they did not currently have a partner (69% vs 22% $p < .01$). Abstinence within six months of their cancer diagnosis was also associated with SD (72% vs 26% $p < .01$). Patients who self-identified as black race compared to white race were three times more likely to have SD (OR = 3.9, 95% CI 1.1–14.3). Patients who received adjuvant chemotherapy and radiation therapy compared to those who did not among the entire cohort had an increased risk of SD (OR = 3.4, 95% CI 1.2–9.6). In our diverse population, almost half of our patients were identified to have SD. Black as compared to white race reported significantly higher sexual dysfunction. An increased risk for sexual dysfunction was observed among those women who received chemotherapy and radiation with or without surgery.

Precis: Survivorship is an important issue for women with gynecologic malignancies. This study addresses the high rates of sexual dysfunction in a racially diverse patient population.

1. Introduction

In 2018, almost one million women in the USA were reported to be survivors of gynecologic malignancies (Siegel et al., 2017). As a greater numbers of patients survive cancer, their quality of life becomes an increasingly important issue. Gynecologic cancer survivors report sexual health among their highest concerns on quality of life surveys and the prevalence of sexual dysfunction (SD) is reported between 30 and 100% (Sadovsky et al., 2010; Abbott-Anderson and Kwekkeboom, 2012; Grover et al., 2012).

Despite its significance, there is a communication gap surrounding sexual health issues between women with gynecological cancer and their providers. Sadovsky et al. reported that 50% of patients felt that their concerns about sexual health were disregarded (Sadovsky et al., 2010). In another study, 40% of gynecologic cancer survivors expressed interest in help with their sexual issues though only 7% sought help (Steele and Fitch, 2008). Approximately 75% of Gynecologic Oncologists admitted that sexuality is an important discussion to have with their patients; while 62% of patients reported that they never had a discussion about sexual health with their provider (Hill et al., 2011). The therapeutic modalities used to treat cancer - surgery, chemotherapy and radiation - may all contribute to impaired sexual function including vaginal shortening, dryness, changes in bowel and bladder function, and increased pain with intercourse (Sadovsky et al., 2010).

Studies investigating cancer survivors' with SD have mainly focused on women with breast cancer (Hill et al., 2011; Grover et al., 2012). There is a dearth of information regarding the sexual health or dysfunction among a diverse group of women with gynecologic malignancies. Studies have cited the need to identify sub-groups of gynecologic cancer survivors at risk for SD (Carter et al., 2013). Bradford et al.

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recently described high rates of sexual inactivity and SD among medically underserved women recently treated for a gynecologic cancer (Bradford et al., 2015). Our primary aim was to evaluate prevalence of SD in an ethnically/racially diverse population of women with gynecologic malignancies and to examine differences in sexual function based on different treatment modalities.

2. Methods

After Institutional Board Approval, women treated for gynecologic malignancies at Montefiore and Jacobi Medical Centers, between 11/2015 and 3/2017, were consecutively recruited. The inclusion criteria were women with histopathologic diagnosis of cervix, uterine, vaginal and vulvar carcinoma who have completed treatment at least 6 months prior to recruitment. Patients with ovarian cancer were excluded given one of the aims of the questionnaire was to assess post radiation sexual dysfunction and patients with ovarian cancer rarely undergo radiation therapy.

2.1. Measure

Female Sexual Function Index (FSFI), a self-assessment questionnaire that measures sex related personal distress over the last 4 weeks was used. FSFI is a 19-item instrument that measures 6 domains of sexual function: Desire, Arousal, Lubrication, Orgasm, Satisfaction, and Pain (S1). For this study, we defined sexual dysfunction if the overall FSFI score ranked below 26.55 (Hughes et al., 2015; Wiegel et al., 2005).

Informed consent and the FSFI were available in English and Spanish in paper format as per patient preference (S1). Patients were instructed to read through the definitions of sexual function, activity, intercourse, and stimulation as defined by the FSFI form and were asked to complete it independently. Although the FSFI was originally developed and validated among healthy women, studies have demonstrated strong psychometric properties supporting its continued use for diagnosing SD and monitoring sexual function among cancer survivors (Rosen et al., 2000; Baser et al., 2012).

In addition to administering the FSFI, patient's socio-demographic and clinical characteristics were collected from the medical records. A subset of women ($n = 11$) were followed via telephone for qualitative survey during which they were asked how they felt about the encounter and if they would be interested in receiving therapy for sexual issues if interventions became available. Qualitative portion included open-ended questions that expand information based on participants' lead noting: the participants' tone of voice, lapses in speaking, crying. Some guided interview questions included “Do you understand why we are interested in your sexual function?, Have you thought about this before?, Has another provider ever asked you about your sexual functioning?, and How did you feel about being asked to do a questionnaire about your sexual function?”

2.2. Statistical methods

Distribution of data were numerically summarized using descriptive statistics. The prevalence of SD was estimated along with Clopper-Pearson exact 95% confidence interval. The association between SD and categorical covariates were assessed using Chi square test or Fisher's exact test. The difference in continuous variable was assessed using Student *t*-test or Wilcoxon rank sum test and multivariable logistic regression was used to assess the association between SD and other clinical and demographical variables. All analyses were performed using SAS version 9.4.

2.3. Sample size

We estimated a sample size of 139 would produce a two-sided 95% confidence interval to obtain a width of 15% under the assumption that prevalence of SD would be 75% and the interval would range between 67 and 82%; with 12% drop out rate assumption, 159 participants were recruited.

Table 1
Distribution of patient characteristics by sexual dysfunction.

Characteristic	Sexual dysfunction N (%)	No Dysfunction N (%)	*P* value
Age (Years) Mean (SD)	58.9 (11.9)	62.2 (10.5)	0.07
Race/Ethnicity			
Hispanic	24 (42.9)	32 (57.1)	0.28
Black	27 (55.1)	22 (44.9)	
White	10 (34.5)	19 (65.5)	
Others	8 (38.1)	13 (61.9)	
Partner			
Yes	19 (22.4)	66 (77.7)	**<0.01**
No	43 (69.4)	19 (30.7)	
Sexual Activity (prior 6 months)			
Yes	24 (25.5)	70 (74.5)	**<0.01**
No	41 (71.9)	16 (28.1)	
Diagnosis			
Uterine	53 (47.3)	59 (52.7)	0.49
Cervix	15 (36.6)	26 (63.4)	
Vaginal	1 (50.0)	1 (50.0)	
Surgery			
Yes	65 (46.8)	74 (53.2)	0.12*
No	4 (25.0)	12 (75.0)	
Route of Surgery ($n = 139$)			
Laparoscopy	37 (44.1)	47 (55.9)	0.43
Laparotomy	28 (50.9)	27 (49.1)	
Type of Surgery (n = 139)			
Simple	54 (47.4)	60 (52.6)	0.76
Radical	11 (44.0)	14 (56.0)	
Radiation			
Yes	28 (51.9)	26 (48.2)	0.18
No	41 (40.6)	60 (59.4)	
Chemotherapy			
Yes	26 (53.1)	23 (46.9)	0.15
No	43 (40.6)	63 (59.4)	
Dilator Use			
Yes	19 (45.2)	23 (54.8)	0.65
No	44 (41.1)	63 (58.9)	

Bold p values refer to statistically significant pvalues in this analysis
* P value based on Fisher's exact test.

3. Results

A total of 159 patients were recruited of which, 4 patients were excluded; 2 patients were noted to have pre-invasive disease and 2 patients did not complete the survey. The overall prevalence of sexual dysfunction was 44.5% (95% CI: 36.5%, 52.7%). The patient's demographic and clinical characteristics by outcome are presented in Table 1. The average age of patients was 60.4 years (SD: 11.4). Thirty-six percent ($n = 56$) of participants identified themselves as Hispanic, while 32% and 19% identified themselves as black and white respectively. These findings are consistent with our practice population. Of the patients, 85 (58%) reported having a current partner and 94 (62%) reported sexual activity in the past 6 months prior to the diagnosis. The most common cancer site was uterine (72%), followed by 26% (41) diagnosed with cervical cancer, and 1.3% (2) with vaginal cancer. Almost 90% ($n = 139$) had surgery of which, 60% (84) had a laparoscopic procedure and 18% (25) had radical hysterectomy. Thirty one percent of these women had adjuvant therapy. Twenty eight percent ($n = 44$) had chemotherapy and radiation therapy, 6% had radiation therapy alone and 3% had chemotherapy alone.

Table 2
Odds ratios, 95% Confidence Interval and p value of sexual dysfunction from logistic regression models: (i) All patients and (ii) patients who underwent surgery only.

Variables	Model 1: All patients (N = 155)		Model 2: Surgery Patients only (N = 139)	
	Odds ratio (95% CI)	P value	Odds ratio (95% CI)	P value
Age	1.0 (0.9, 1.1)	0.69	1.0 (1.0, 1.1)	0.38
Race/Ethnicity				
Hispanic	2.3 (0.6, 8.4)	0.23	3.1 (0.8, 12.4)	0.11
Black	3.9 (1.1, 14.3)	**0.04**	4.8 (1.2, 19.5)	**0.03**
Others	0.6 (0.1, 3.3)	0.52	0.9 (0.1, 6.3)	0.9
White	1.0			
Partner				
Yes	9.8 (37, 26.3)	<**0.01**	11.5 (4.1, 32.8)	<**0.01**
No	1.0			
Sex Before 6 months				
Yes	4.7 (1.9, 11.8)	<**0.01**	3.5 (1.3, 9.4)	**0.01**
No	1.0			
Surgery				
Yes	12.9 (2.1, 79.9)	<**0.01**	-	-
No	1.0			
Adjuvant (Chemo/RT) Therapy				
Yes	3.4 (1.2, 9.6)	**0.02**	3.5 (1.2, 9.9)	**0.02**
No	1.0			

Bold p values refer to statistically significant pvalues in this analysis

Patients were significantly more likely to report SD if they reported not having a current partner (69% vs 22% $p < .01$). Similarly, those who reported no sexual activity 6 months prior to their diagnosis (72%) had higher rates sexual dysfunction compared to those who reported sexual activity (26%) ($p < .01$). There was no significant association with SD and the treatment modality: having surgery (47% vs 25%, $p < .12$), receiving radiation (52% vs 41%, $p < .18$), receiving chemotherapy (53% vs 41%, $p < .15$), or receiving both chemotherapy and radiation (52% vs 48%, $p < .22$). The distribution of FSFI domain scores including desire, arousal, lubrication, orgasm, satisfaction and pain showed no significant difference.

Multivariable logistic regression was performed to evaluate the association between different patient characteristics and the outcome of SD.(Table 2) The model showed the odds of SD was 3.9 times (95% CI: 1.1, 14.3) higher in women who self-identified as being of black race compared to those identified as white race. Similarly, a 2.3 times (95%CI: 0.6–8.4) higher odds of SD was observed among patients identifying themselves as Hispanic ethnicity as compared to non-Hispanic ethnicity, this was not statistically significant.($p = .22$) The odds of SD were 3.3 times higher among patients who received adjuvant therapy compared to those who did not. The risk of SD was 12.9 times higher in women who had surgery compared to those who did not (95% CI: 2.1, 79.9). In a sub-cohort of women who received surgery ($n = 139$), the results revealed a stronger association compared to white race, the odds of SD was almost 4.8 (95% CI: 1.2, 19.5) and 3.1 (95%CI: 0.8, 12.4) times more in blacks and hispanics, respectively. Those who had adjuvant therapy had 3.4 (95%CI: 1.2, 9.6) times the risk of SD compared to those who did not.

Of the 11 women who were followed for qualitative interview, 10 women were happy to further discuss the study and felt that participating allowed them to further describe their concerns. Themes that emerged included: women felt that providers do not speak to them about the possible changes to their sex lives after surgery or treatment, and women felt uncomfortable bringing it up. Comments included “I felt it was important to speak about; I have lots more questions,” and “I would like to talk more about this with my doctors.” Also, “this should have been brought up before my surgery.” Three women stated that they wished there was a support group to discuss this more.

4. Discussion

This study highlights the rates of SD in women with gynecologic cancers, specifically among a diverse patient population in the Bronx. Our rate of SD was 44.5%, which is consistent with previous reports (Sadovsky et al., 2010; Abbott-Anderson and Kwekkeboom, 2012; Grover et al., 2012; Bradford et al., 2015). Women receiving adjuvant treatment or surgery experience SD, therefore, continued evaluation of SD is necessary to improve sexual function. We demonstrated an association between SD and Black race. Social components including having a current partner and abstinence in the past six months were strongly associated with SD.

We also had a high rate of sexual inactivity, with 62% defining themselves as sexually active. Our study includes comprehensive data on SD and treatment in a large and diverse cohort of women with gynecologic malignancies, and the majority of our patients were of minority race. Unlike previous studies, we did not find an increased rate of SD in our patients who had received radiation therapy. Black race was an independent risk factor for SD in the gynecologic cancer population, which has not been reported. The qualitative portion of our study supports the previous literature that gynecologic cancer survivors prioritize sexual function as an important part of their survivorship. This study reiterates that physicians and other health care providers should designate time to discuss sexual function and activity with their patients.

Some limitations of the study include the lack of data on stage of disease and it is unknown if the level of literacy/socioeconomic status had an effect on our patients' ability to answer the FSFI. Selection bias may be present if women who agreed to participate in the study already knew they suffered from SD. Additionally, patients may suffer from recall bias given questions are asking about the last 4 weeks of sexual activity. The FSFI tool also has significant limitations, as it is unable to capture certain aspects of a women's sexual life. While having a partner may decrease the risk of SD, there is evidence that the FSFI does not assess sexual function as well if a patient does not have a partner (Baser et al., 2012). The inability to answer certain items in the FSFI, specifically numbers 15 and 16, has been reported in the literature and is a limitation of the survey (Baser et al., 2012; Brotto, 2009). FSFI Question 15 does not have the option to state either “no sexual activity or no partner.”(S1) Many patients hand wrote “Not applicable” or “No partner”. It is possible that the women who are not sexually active are content with their inactivity and have falsely skewed the rate of SD. The FSFI has been criticized in its use in the oncology setting, specifically in women who are not sexually active (Brotto, 2009). As discussed in the validation study, women who are “non-zero” responders to at least 8 of the 15 items, are considered to be sufficiently sexually active for the FSFI scores to be valid indicators of their sexual function (Baser et al., 2012). However, this threshold for sexual activity was chosen by rational means, and needs further validity evaluation (Baser et al., 2012). As a result of the lack of predefined sexual activity prior to use of FSFI, the rates of SD may be elevated in women with cancer. Additionally, given there is no pre-FSFI administered prior to diagnosis of cancer and treatment, the high rates of sexual dysfunction may also be related to undiagnosed hypoactive sexual desire disorder. Other tools validated for assessment in women with cancer include the Sexual Function Questionnaire. This tool also requires women to be sexually active, however, does not require recent sexual activity. Additionally, the scores using this tool can be calculated even if blanks are noted, as long as 75% of questionnaire is answered (Syrjala et al., 2010). This can be useful to fill in the gaps of the FSFI noted above.

Interestingly, we found no significant difference in SD with any treatment modalities except when any type of adjuvant treatment was compared to surgery alone. Black race was associated with a 3-fold increased risk of reporting symptoms consistent with SD. The

qualitative study suggests that our patients would like more regular conversation about sexual function. As survivorship becomes increasingly more important in the care of women with gynecologic malignancies, early introduction and implementation of support groups for survivors focusing on sexual function is beneficial. We suggest that all oncologists (gynecologic/medical/radiation) incorporate a sexual function discussion in the early patient visits after their cancer diagnosis and throughout treatment/surveillance. Future studies should focus on differentiating among pain and hypoactive sexual desire disorder in cancer patients and explore the use of Flibanserin in cancer survivors. Longitudinal research will be beneficial to evaluate SD and identify the ideal time that patients would benefit from interventions. We also recognize that SD is impacted by multiple factors including psychosocial factors - depression, anxiety, and body images. Future studies should focus on addressing these contributing factors to female sexual function in cancer.

Author contributions

Dr. Frimer assisted with participant recruitment, data interpretation, and manuscript preparation. Dr. Turker helped with participant recruitment, data analysis and manuscript preparation. Dr. Cardaci participated in participant recruitment and conduct of participant interviews. Dr. Rosenthal participated in participant recruitment and data collection. Dr. Shankar was involved in designing the study, conducted the analysis interpretation of data, drafting and critical review of this manuscript. Drs. Kuo, Goldberg, and Van Arsdale assisted with identification of eligible participants and final editions to the manuscript. Dr. Nevadunsky assisted with participant recruitment, adherence to study protocol, interpretation of data analysis and manuscript preparation. Input from all of the authors was used for the final editions to the manuscript. All authors have approved the final article.

Declaration of Competing Interests

The authors did not report any potential conflicts of interest.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.gore.2019.100495.

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