Published in final edited form as:

Am J Obstet Gynecol. 2010 November ; 203(5): 514.e1–514.e7. doi:10.1016/j.ajog.2010.08.004.

Pelvic floor disorders and sexual function in gynecologic cancer survivors: a cohort study

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Abstract

OBJECTIVE—The purpose of this study was to assess the prevalence of pelvic floor disorders and sexual function in survivors of gynecologic cancer.

STUDY DESIGN—We surveyed survivors of gynecologic cancer (survivors) and women seeking gynecologic care (control patients) who were >30 years old. All survivors were disease- and treatment-free for 1 year. Validated questionnaires were used to evaluate pelvic floor disorders.

RESULTS—One hundred eight control patient and 260 survivor questionnaires were completed. A high prevalence of pelvic floor disorders was observed in both groups; 56% of control subjects and 70% of survivors reported moderate-to-severe urinary incontinence ($P > .05$). Survivors were more likely to experience fecal incontinence (42% vs 32%; $P = .02$). Survivors reported less sexual desire ($P = .04$) and less ability to climax ($P = .04$), despite no difference in dyspareunia.

CONCLUSION—Fecal incontinence and sexual dysfunction are significant problems in survivors of gynecologic cancer.

Keywords

incontinence; pelvic floor disorder; sexual dysfunction; survivor of cancer

Survivors of cancer number approximately 10 million in the United States.¹ With an increasing aged population, this number will continue to grow. As cancer treatment improves, cancer survivor's quality of life and long term health outcomes have gained increasing importance with health care providers. Cancer survivorship crosses all aspects of patient health, which includes a patient's physical, emotional, occupational, and social well-being. In 2007, approximately 78,000 women were diagnosed with gynecologic cancer, which included uterine, cervical, ovarian and vulvar malignancies.¹

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Presented at the 36th Annual Scientific Meeting of the Society of Gynecologic Surgeons, Tucson, AZ, April 12-14, 2010.

Authorship and contribution to the article is limited to the 5 authors indicated. There was no outside funding or technical assistance with the production of this article.

Many therapeutic advances for gynecologic cancer have evolved within the last 20 years and have led to improved quality of life during and immediately after either surgical or medical treatments. Some advances, such as the introduction of chemoradiation for lower genital tract cancers and improvements in radiation technique for a variety of gynecologic malignancies, have also improved survival rates for women with gynecologic malignancies.² Minimally invasive surgical approaches for both cervical and endometrial cancer have enhanced the patient's perioperative quality of life and decreased operative morbidity. Introduction of less radical vulvar cancer surgery has likewise decreased perioperative morbidity with improved long term outcomes. Nonetheless, often the same treatment that offers a cure for the cancer leads to long-term side-effects that can diminish a survivor's quality of life. The growing number of survivors of cancer presents a challenge for providers of women's healthcare to think beyond cancer treatment and start considering the needs and issues that will enhance the quality of life for those women who live beyond cancer.

One important aspect of quality of life that is directly impacted by gynecologic cancer and treatment is pelvic floor function. Common pelvic floor disorders include pelvic organ prolapse, urinary incontinence (UI), anal incontinence, and sexual dysfunction. These disorders are known to affect quality of life negatively and, despite high prevalence, are under assessed in survivors of gynecologic cancer. Our knowledge of how prevalent pelvic floor disorders are in survivors of gynecologic cancer and how the cancer treatment influences these problems is limited. Our study objectives are to assess the prevalence of pelvic floor disorders and sexual dysfunction in survivors of gynecologic cancer compared with women at a general gynecology clinic who had no history of a gynecologic cancer.

MATERIALS AND METHODS

This study was performed at the University of New Mexico Health Sciences Center through the Department of Obstetrics and Gynecology. Institutional review board approval was obtained. Our control patients were women at a general gynecology clinic who were 30 years old without a diagnosis of cancer. Our survivors of gynecologic cancer were women who attended the gynecologic oncology clinics for routine surveillance visits who were 30 years old and had a history of uterine, cervical, ovarian, or vulvar cancer. No women attending the urogynecology clinic were enrolled into either study group. All survivors had been disease and treatment free for at least 1 year.

Written consent was not required because this was an anonymous survey. All eligible patients were offered participation in the survey during clinic visits. The study was conducted over a 10- month time period. Clinic schedules were screened for eligible patients, and every attempt was made to offer the survey to all eligible patients. Eligible women were asked to complete the survey at the time of their doctor's visit. The survey included demographic information and medical/surgical information. Survivors of cancer provided recall data regarding their cancer diagnosis and treatment. Validated questionnaires measured UI severity with the Sandvik Incontinence Severity Index,³ anal incontinence with the Wexner Fecal Incontinence scale,⁴ pelvic organ prolapse with question #35 from the Epidemiology of Prolapse and Incontinence Questionnaire,^{5,6} and sexual function with the Pelvic Organ Prolapse/Urinary Incontinence Sexual questionnaire (PISQ-12).⁷

The Sandvik Incontinence Severity Index is a 2-question symptom severity scale that measures the presence and amount of urinary leakage. The Sandvik Incontinence Severity Index has been validated against pad weights and urinary diaries of incontinent women. Presence of any UI is defined as a score of >0 . Moderate-to-severe UI is defined as a score of ≥ 3 .³

The Wexner Fecal Incontinence Scale measures the presence and severity of anal incontinence symptoms.⁴ The scale records both the type (gas, mucus, liquid, solid stool) and frequency of anal incontinence symptoms. Presence of anal incontinence is defined as a score of >0 . Fecal incontinence in our study is specific to leakage of liquid or solid stool and not gas incontinence.

The presence of prolapse was defined as an affirmative answer to question #35 from the Epidemiology of Prolapse and Incontinence Questionnaire. This question was also used by Lukacz et al⁵ and Nygaard et al⁶ in assessments of pelvic floor disorders and was found to indicate severe symptoms.

Finally, the Pelvic Organ Prolapse/Urinary Incontinence Sexual questionnaire (PISQ-12) was used to assess sexual function in our study. The questionnaire consists of 12 questions, 9 of which are not specific to women with pelvic floor disorders. Use of the 9 general questions allows for comparison of function in women with and without pelvic floor disorders. We also included a question in the survey to evaluate how often providers ask patients about pelvic floor disorders during their care.⁷

Two hundred fifty survivors of gynecologic cancer and 100 gynecologic patients were required to detect a 20% difference in the rates of UI between groups, with an alpha error of .05 and a beta of 80%. UI is the most common pelvic floor disorder and has been reported previously in the literature, although rates of anal incontinence, prolapse, and sexual dysfunction have been studied more poorly among survivors of cancer.⁶ Statistical analysis included descriptive statistics, Student *t* tests, and Fisher's exact tests, as appropriate to compare the groups. PISQ scores were adjusted for possible differences in baseline values with the use analysis of covariance. Multivariable logistic regression analysis was used to verify whether variables that differed between groups were covariates. Data analysis was performed with SAS/STAT software (SAS Institute Inc., Cary, NC).

RESULTS

One hundred eight gynecologic patients and 260 cancer survivor questionnaires were completed. Demographic data are summarized in Table 1. Survivors of cancer were older (57 ± 12 vs 47 ± 10 years; $P < .001$) and were more likely to be in a committed relationship (46% vs 34%; $P = .04$) but did not differ from control patients with respect to race, except there were more Native American women in the cancer survivor group (16 vs 8%; $P = .03$), which demonstrated the referral pattern for cancer care in New Mexico. Survivors of cancer were also more likely to have undergone hysterectomy (87 vs 26%; $P < .001$) and bilateral oophorectomy (82% vs 14%; $P < .001$). Parity was similar between the control and the survivor groups, with a mean number of children ($n = 2$) in both groups. Given the known

effects of age, hysterectomy, and menopausal status on pelvic floor disorders, all differences described later were controlled for in multivariate analyses.

Among survivors, the most prevalent gynecologic cancer was endometrial (45%), followed by ovarian (29%) and cervical (22%). The most common intervention that survivors of gynecologic cancer had undergone was surgery (87%), followed by radiation (35%) and chemotherapy (35%). Twenty-five percent of the survivors of cancer reported experiencing symptoms of a pelvic floor disorder before their diagnosis of cancer (Table 2). Most of the patients with cancer (62%) had completed their treatment within the last 1–4 years.

A high prevalence of pelvic floor disorders was observed in both groups (Table 3). Fifty-six percent of control patients and 70% of survivors reported any UI, with 26% of control patients and 42% of survivors reporting moderate-to-severe UI (both $P > .05$). Prolapse symptoms were uncommon; only 13% of control patient's vs 9% of survivor's reported symptoms ($P > .05$). Survivors were more likely to experience anal incontinence than control patients (43% vs 32%; $P = .02$). Fecal incontinence was also a significant problem for survivors of cancer; 43% of survivors reported leakage of liquid and/or solid stool, compared with only 32% of control patients (43% vs 32%; $P = .02$). Survivors experienced more bother from their fecal incontinence, which was assessed by fecal incontinence severity scores (1.0 vs 2.8; $P = .003$). All of these comparisons were performed with the use of multivariate analysis to control for age, hysterectomy, and menopausal status. Only 40% of survivors of cancer reported ever being asked about urinary/fecal incontinence or sexual function by their oncologist. Control patients were also asked infrequently about urinary/fecal incontinence or sexual function; only 23% of the women reported ever being asked. Survivors of cancer were less likely to be sexually active than the gynecologic patients (45% vs 70%; $P < .001$), and mean PISQ-12 scores were significantly lower than the gynecologic patients (37 ± 6 vs 32 ± 7 ; $P < .001$). The 12 questions in the PISQ were evaluated individually for difference between the groups; the data are summarized in Table 4. Survivors of cancer reported less sexual desire, less ability to climax and less intensity of the climaxes achieved, less sexual excitement and satisfaction with the variety of sexual activities, and more negative emotional reactions to sexual activity. There was no difference in dyspareunia, impact of pelvic floor disorders, or partner functioning between the 2 groups

COMMENT

We found that UI and pelvic organ prolapse did not differ between survivor and gynecologic control groups, although survivors of cancer were more likely to report bothersome fecal incontinence symptoms, less sexual activity, and lower sexual function scores. Rates of UI were not different between groups, but UI was the most common pelvic floor disorder in both groups. Despite the prevalence and the adverse impact on quality of life, few survivors had been asked about these problems by their cancer healthcare providers.

Sexual function was impaired significantly in our cancer survivor group. This effect was seen, despite the data being controlled for the age difference in our groups. The differences in rates of activity and function between groups cannot be explained by dyspareunia, which may result from radical surgery or radiation because dyspareunia rates were similar between

groups. Sexual function in women is multifactorial and can be affected by physical, social, and psychologic factors. Specific to survivors of gynecologic cancer, radical pelvic surgery, early withdrawal of hormone function, radiation effects, and changes in body image could all play a role in the impairment of sexual function. Our study highlights the emotional difficulties that survivors of cancer have with sexual function. Their sexual dysfunction seemed to be related to low desire, infrequent and less intense climax, and the presence of negative emotional reactions to sexual activity. These types of problems may be related to changes in body image and hormone function after cancer treatment.

Other published studies support a negative impact on sexual function among survivors of cancer after treatment. Of 41 women who had undergone vulvar surgery for either vulvar carcinoma or carcinoma in situ, women reported deterioration in body image after vulvectomy and a significant decrease in sexual frequency after surgery. Sexual dysfunctions reported after vulvectomy included sexual aversion disorder, arousal disorder, and hypoactive sexual disorder. The authors concluded that women experience significant sexual dysfunction after vulvectomy and that the extent of surgery or type of vulvectomy did not correlate exactly with the degree of sexual dysfunction.⁸

Changes in sexual function are not short term but have proved to be lifelong problems in this patient population.⁹ A cross-sectional study of 860 survivors of cervical cancer found that survivors of cancer also experienced more lymphedema, worse body image, impaired sexual/vaginal function, and more sexual worry when compared with 494 control subjects with no history of cancer. Not all reports, however, are negative. Long-term survivors (i.e., 5–10 years) have reported overall good quality of life parameters when compared with control patients in 1 cross-sectional study that compared 50 long-term survivors of cancer with 50 age-matched control patients. Nonetheless, psychologic and reproductive concerns continued to be important to survivors, 59% of whom stated that they would attend a support group to discuss issues related to their history of cervical cancer.⁹

Fecal incontinence was surprisingly common among survivors of gynecologic cancer in our study. Forty-three percent of the survivors of cancer reported frequent inability to control the loss of either liquid or solid stool. Our analysis was unable to determine whether certain cancer types or certain cancer treatments influenced the likelihood of the development of fecal incontinence. A recent population-based survey study reported on 789 survivors of gynecologic cancer who had undergone pelvic radiation therapy. They compared this group to age-matched cancer-free women. The survivors of cancer reported a higher occurrence of long-lasting fecal incontinence compared with the population control patients.¹⁰

Like others, we found that UI was the most commonly reported pelvic floor dysfunction, with more survivors reporting UI than control patients. We limited our definition of incontinence to include only those women with moderate-to-severe symptoms, because they represent women who are more likely to be bothered by their symptoms. The reason for the high incidence of UI among survivors of gynecologic cancer is most likely multifactorial. Survivors have many risk factors that are associated with UI, which include older age, hormonal status, obesity, childbirth, and smoking. More patients with cancer undergo early menopause because of either surgical or radiation therapy, which may also place them at risk

for pelvic floor dysfunction. We were able to control for difference in age, menopausal status, and history of hysterectomy (which was different between groups) but did not collect data on body mass index, because this was an anonymous survey. Whether women's cancer treatment contributed to their high rates of development of UI remains speculative.

Despite the high incidence of incontinence among survivors, UI remains under assessed in our patient population with cancer. Less than one-half of the survivors of cancer in our study reported ever being asked about incontinence or sexual dysfunction by their oncologists during or after treatment completion. The rate of pelvic floor disorder assessment was also very low within the control population; however, this would be expected, because the patients with benign disease did not have a current or immediately past disease process. Other studies have confirmed provider's difficulties with diagnosing these problems. One recent survey-based study evaluated gynecologic oncologists' ability to detect UI with routine consultation compared with the administration of validated questionnaires. Similar to our findings, the survey found that 60% of the gynecologic oncology patients reported at least 1 symptom of UI by survey, although only 5% of women were diagnosed when the oncologist assessed incontinence during the patient encounter. The study concluded that patients were significantly more likely to report UI symptoms on the questionnaire than either their gynecologist or gynecologic oncologist was able to elicit during consultation.¹¹

There were a number of strengths and limitations in our study. Strengths of our study include the use of validated questionnaires and a cancer-free control group for comparison. Also, this is one of the few analyses to evaluate the entire spectrum of pelvic floor disorders that included urinary and fecal incontinence, prolapse, and sexual function. We used an anonymous survey so the data were self-reported, which has advantages and disadvantages. Patients may have been more likely to report these intimate types of problems anonymously; however, self-reporting of medical history details may be inaccurate. Although there were some important demographic differences between our survivor and control groups (such as age or menopausal status), we controlled for these potential confounders using multivariable analysis. Finally, there is a potential for selection bias in our study because women with pelvic floor disorders or sexual dysfunction may have been more likely to consent to complete the survey.

In summary, sexual dysfunction and fecal incontinence are significant problems for survivors of gynecologic cancer. UI is also common among this patient population. Perhaps more importantly, oncologists do a poor job of eliciting these problems during cancer care. Incontinence and sexual dysfunction should be discussed more openly with patients with cancer as a potential long-term side-effect of cancer treatment. A well-informed patient may be more likely to mention problems and seek out treatment options. Hopefully, our report will increase provider awareness of pelvic floor disorders as a major source of treatable morbidity and may lead to improvement in quality of life survivors of cancer have fought so hard to keep.

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Table 1

Patient Characteristics

Variable	Gynecologic patients (n = 108)	Survivors of gynecologic cancer (n = 260)	P value
Age, y ^a	47 ± 10	57 ± 12	< .001
High school education, %	72	61	.05
Partner, %	34	46	.04
Native American, %	8	16	.03
Household Income > \$10,000 %	55	50	NS
Parity, n ^b	2.2 (0–9)	2.2 (0–12)	NS
Nulliparous, %	22	25	NS
Menopause, %	36	83	< .001
Hysterectomy, %	26	87	< .001
Bilateral oophorectomy, %	14	82	< .001

NS, not significant

^aData are given as mean ± SD;

^bData are given as mean (range).

Table 2

Survivor characteristics

Variable	n (%)
Cancer Type	
- Ovarian	73 (29)
- Endometrial	113 (45)
- Cervical	55 (22)
- Vulvar	5 (2)
- Unknown	4 (2)
Cancer treatment type	
- Chemotherapy	91 (35)
- Surgery	225 (87)
- Radiation	89 (35)
Pelvic floor disorder present before diagnosis	61 (25)

Table 3

Pelvic floor disorder statistics

Variable	Gynecologic patients (n = 108), n (%)	Survivors of gynecologic cancer (n = 260), n (%)	P value ^a
Any urinary incontinence: Incontinence Severity Index Score > 0	56 (56)	176 (70)	NS
Moderate/ Severity urinary incontinence	26 (26)	105 (42)	NS
Prolapse	14 (13)	20 (8)	NS
Fecal incontinence	34 (32)	106 (43)	.02
Mean fecal incontinence severity score	1.0	2.8	.003
Mean Pelvic Organ Prolapse/Urinary Incontinence Sexual questionnaire total score	37 ± 6	32 ± 7	<.001

NS, not significant.

^aAdjusted for age, hysterectomy, and menopausal status.

Table 4

Pelvic Organ Prolapse/Urinary Incontinence Sexual questionnaire item analysis

Question	Gynecologic control patients, n (%) ^a	Survivors of gynecologic cancer, n (%) ^b	P value
How frequently do you feel sexual desire?			<.001
1. Always	8 (8)	10 (6)	
2. Usually	29 (29)	21 (12)	
3. Sometimes	42 (42)	69 (40)	
4. Seldom	17 (17)	42 (24)	
5. Never	4 (4)	30 (17)	
Do you climax (have an orgasm) when having sexual intercourse with your partner?			.001
1. Always	18 (20)	17 (11)	
2. Usually	27 (29)	36 (22)	
3. Sometimes	29 (32)	42 (26)	
4. Seldom	12 (13)	26 (16)	
5. Never	6 (7)	40 (25)	
Do you feel sexually excited (turned on) when having sexual activity with your partner?			< .001
1. Always	33 (35)	19 (11)	
2. Usually	29 (31)	53 (32)	
3. Sometimes	21 (23)	44 (27)	
4. Seldom	5 (5)	25 (15)	
5. Never	5 (5)	25 (15)	
How satisfied are you with the variety of sexual activities in your current sex life?			< .001
1. Always	29 (33)	18 (11)	
2. Usually	23 (26)	50 (31)	
3. Sometimes	21 (24)	26 (16)	
4. Seldom	9 (10)	34 (21)	
5. Never	7 (8)	31 (20)	
Do you feel pain during sexual intercourse?			NS
1. Always	4 (4)	12 (7)	
2. Usually	7 (7)	18 (11)	
3. Sometimes	18 (19)	43 (26)	
4. Seldom	24 (25)	32 (19)	
5. Never	42 (44)	62 (37)	
Are you incontinent of urine (leak urine) with sexual activity?			NS
1. Always	0	5 (3)	
2. Usually	1 (1)	2 (1)	
3. Sometimes	8 (9)	19 (12)	

Question	Gynecologic control patients, n (%) ^a	Survivors of gynecologic cancer, n (%) ^b	P value
4. Seldom	7 (8)	19 (12)	
5. Never	77 (83)	120 (73)	
Does the fear of incontinence (either stool or urine) restrict your sexual activity?			NS
1. Always	1 (1)	5 (3)	
2. Usually	1 (1)	4 (2)	
3. Sometimes	6 (6)	10 (6)	
4. Seldom	2 (2)	14 (8)	
5. Never	85 (89)	135 (80)	
Do you avoid sexual intercourse because of bulging in the vagina (either bladder rectum or vagina falling out)?			NS
1. Always	0	4 (2)	
2. Usually	0	0	
3. Sometimes	3 (3)	5 (3)	
4. Seldom	4 (4)	8 (5)	
5. Never	86 (92)	147 (90)	
When you have sex with your partner, do you have negative emotional reactions such as fear, disgust, shame, or guilt?			.005
1. Always	0	5 (3)	
2. Usually	1 (1)	8 (5)	
3. Sometimes	6 (6)	16 (10)	
4. Seldom	6 (6)	28 (17)	
5. Never	81 (86)	110 (66)	
Does your partner have a problem with erections that affects your sexual activity?			NS
1. Always	4 (5)	3 (2)	
2. Usually	5 (6)	7 (4)	
3. Sometimes	10 (12)	37 (24)	
4. Seldom	8 (9)	18 (12)	
5. Never	59 (69)	91 (58)	
Does your partner have a problem with premature ejaculation that affects your sexual activity?			NS
1. Always	3 (3)	5 (3)	
2. Usually	3 (3)	1 (1)	
3. Sometimes	6 (7)	18 (12)	
4. Seldom	13 (15)	21 (14)	
5. Never	62 (71)	107 (70)	
Compared with orgasms you have had in the past, how intense are the orgasms you have had in the past 6 months?			< .001
1. Always	6 (7)	43 (31)	
2. Usually	23 (26)	30 (21)	

Question	Gynecologic control patients, n (%) ^a	Survivors of gynecologic cancer, n (%) ^b	P value
3. Sometimes	42 (48)	58 (41)	
4. Seldom	13 (15)	7 (5)	
5. Never	3 (3)	3 (2)	

NS, not significant.

^a
n = 108 women;

^b
n = 260 women.