

Characterization of a Clinical Cohort of 87 Women with Interstitial Cystitis/Painful Bladder Syndrome

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OBJECTIVE	To provide a characterization of a cohort of women with interstitial cystitis/painful bladder syndrome (IC/PBS) by describing their historical and clinical characteristics. This was reported with the National Institutes of Health chronic prostatitis cohort, but a literature review did not reveal a similar study for women with IC/PBS.
METHODS	A total of 87 women with IC/PBS were referred to the Beaumont Women's Initiative for Pelvic Pain and Sexual Health program. A certified nurse practitioner took a comprehensive history and performed a pelvic exam for each. Data were analyzed using descriptive statistics to describe this cohort.
RESULTS	Most women experienced constant pain for 5 or more years (mean Visual Analog Scale = 5 out of 10). A total of 94.2% had levator pain. More than 50% had vulvar pain with exam. More than half reported a history of abuse, often in more than one life stage. A total of 28% had cesarean births and 76% had a history of miscarriage, stillbirth, or abortion. Women averaged 4 lifetime pelvic surgeries, and 48% had hysterectomies, two-thirds of which were done before IC/PBS diagnosis. Premenstrual women reported pain throughout the menstrual cycle. As many as 12% had chlamydia previously, which was higher than the national average. Common comorbidities were pelvic pain (93%), allergies (86%), and sexual dysfunction (72%).
CONCLUSIONS	This population of women with unrelieved chronic pain, frequency, and urgency is in desperate need of care. Researchers should continue to search for the etiology, prevention, and treatment interventions that are effective in dealing with IC/PBS. It may be most therapeutic to develop a multimodal plan of care that includes physical therapy, oral and intravesical therapies, neuromodulation, and cognitive-behavioral therapies. UROLOGY 71: 634–640, 2008. © 2008 Elsevier Inc.

Terms for interstitial cystitis (IC) are painful bladder syndrome (PBS),¹ bladder pain syndrome (BPS/IC), and IC/PBS. IC/PBS diagnosis includes symptoms of bladder-related pain, pressure, or discomfort associated with urinary urgency or frequency in the absence of infection or pathology. National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) diagnostic criteria include glomerulations or ulcers upon cystoscopy.¹ Nomenclature aside, the literature characterizes IC/PBS patients by symptoms of frequency, urgency, pain, and demographics,² but not by

characterizing the whole patient. Some authors recognize the need for qualitative information including sexual function^{3,4} and mental and physical quality of life⁵; others describe IC/PBS using synthesized literature reviews.⁶ Clinical and research diagnostic criteria vary along with reported prevalence of IC/PBS (1 of 5 women and 1 of 20 men).⁷

The purpose of this report was to provide a characterization of a cohort of women with IC/PBS by describing their historical and clinical characteristics. This was reported with the National Institutes of Health chronic prostatitis cohort,⁸ but a literature review did not reveal a similar study for women with IC/PBS.

MATERIAL AND METHODS

This study included 87 women with IC/PBS referred to the Women's Initiative for Pelvic Pain and Sexual Health program in a large Midwestern referral center from December 2004 through March 2007. Board-certified urologists previously diagnosed IC/PBS using NIDDK criteria. Informed consent and institutional review board approval were obtained. One nurse practitioner obtained a detailed

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Table 1. Demographics and reproductive history

Demographics	No. (%)	Mean
Age	87 (100)	46 (range, 14–69)
Married	60 (69)	
Single	27 (31)	
Education		
<12 yr	5 (5.7)	
High school	33 (37.9)	
Bachelor's degree/some college	31 (35.6)	
Postgraduate	18 (20.7)	
Race		
White	85 (97.7)	
Nonwhite	2 (2.3)	
Working outside home	40 (46)	
Age of IC/PBS diagnosis		38.6 (range, 13–69)
Years since IC/PBS diagnosis		Mean yr diagnosed, 1998
0–4	31 (35.6)	
5–9	22 (25.2)	
10–14	18 (20.6)	
≥15	16 (18.4)	
Menarche	82 (94)	12.5 (age)
Menopausal (including surgery)	49 (56)	41.1 (age)
Currently receiving hormone replacement therapy	27 (55)	
Pregnancies	87 (100)	2.4
Births	84 (94)	1.5
Voluntary terminations, spontaneous abortions, stillbirths	66 (76)	.4
Vaginal deliveries	94/130 (72.3)	
Cesarean deliveries	36/130 (27.7)	
Average birth weight		7.3 lb
Episiotomy	41/63 (65.1)	
Tears: urethral, vaginal, rectal	21/56 (37.5)	
Forceps	14/56 (23.2)	
Births in relation to IC/PBS diagnosis	89.7% were before IC diagnosis 3.1% were the same yr as IC diagnosis 7.2% were after IC diagnosis	
Birth control	Pills = 9 (9.2)	Condoms = 6 (6.9%)
Not sexually active = 9 (10.3%)	Tubal ligation = 4 (4.6)	Other = 11 (12.7%)
Menarche	82 (94)	12.5 (age)
Menopausal (including surgery)	49 (56)	41.1 (age)

IC/PBS = interstitial cystitis/painful bladder syndrome.

interview history including demographics, family and personal medical history, psychosocial history, and birth and sexual history using SAFE (Stress/Safety; Afraid/Abused; Friends/Family; Emergency Plan) questions⁹ and performed a physical examination including a q-tip swab assessment for vulvodynia, vaginal pH, and levator muscle assessment.

Data were reported using descriptive statistics. Valid percentages are reported because all questions did not apply to all subjects, or some subjects did not provide responses. Some data are reported as a mean with response range noted.

RESULTS

Demographics and Reproductive History

The average age was 46 and the mean year of IC/PBS diagnosis was 1998 (Table 1), with more than 60% diagnosed 5 or more years ago. Patients averaged 2.4 pregnancies and 1.5 births. Most births (72.3%) were vaginal, with 27.7% cesareans and average birth weight of 7.3 lb. Most women who had vaginal births reported episiotomies or

tears at birth. Almost 90% experienced childbirth before their IC/PBS diagnosis, whereas 7.2% had their babies after they were diagnosed. A total of 76% had experienced a miscarriage, abortion, or stillbirth.

Premenopausal women's contraception included abstinence (10.3%), pills (9.2%), condoms (6.9%), tubal ligation (4.6%), and other (withdrawal, diaphragm, etc.) (12.7%). Most (77.1%) never had a sexually transmitted infection (STI) but 11.9% had a history of chlamydia, 10.7% had human papillomavirus (HPV), and 9.4% had herpes (Table 2). Almost one-third had more than 3 yeast infections per year (self-reported). Premenopausal women (80%) reported pain at ovulation and after menses of 3.9 out of 10, with a pain increase to greater than 5 out of 10 before and during menses.

Physical Examination Findings

More than 80% had a negative KOH slide, a vaginal pH of 5, and negative urine. More than 50% had vulvar pain

Table 2. Gynecologic factors, pelvic surgeries, and procedures

Variable	No. (%)	Mean
Vaginal pH upon exam	71/87 (81.6)	5.08
Urine dipstick-negative	38/42 (90)	
KOH slide negative upon exam	53/60 (88)	
Yeast infections >3/yr	26/87 (29.9)	
History of sexually transmitted infections		
None	64/83 (77.1)	
Chlamydia	10/84 (11.9)	
HPV	9/84 (10.7)	
Herpes	8/85 (9.4)	
Gonorrhea	2/82 (2.4)	
Syphilis	0/82 (0)	
Vulvar pain present upon q-tip swab examination at:		
5 o'clock	47/78 (60.2)	
6 o'clock	33/77 (42.9)	
7 o'clock	41/78 (52.6)	
Menstrual cycle pain		Pain level (0–10) scale
Ovulation pain	32/38 (84)	3.9
Pain before period	35/38 (92)	5.6
Pain with period	35/38 (92)	5.4
Pain after period	35/38 (92)	3.9
Levator pain with pelvic examination	82/87 (94.2)	Right = 3.7, left = 4.0
Lifetime pelvic surgeries	86/87 (99)	4.4 (range, 0–21)
≥3	20/87 (23)	
2	18/87 (20.7)	
1	27/87 (31)	
Surgeries in relation to IC/PBS diagnosis		
Pelvic before diagnosis	87/150 (58)	
Pelvic same yr as diagnosis	13/150 (9)	
Pelvic after diagnosis	50/150 (33)	
Hysterectomy (total & partial)	41/87 (48)	
Hysterectomy before IC/PBS diagnosis	27/41 (66)	
Hysterectomy same yr IC/PBS diagnosis	6/41 (15)	
Hysterectomy after IC/PBS diagnosis	8/41 (20)	
Laparoscopy	37/87 (42.5)	
Laparoscopy before IC/PBS diagnosis	35/59 (59)	
Laparoscopy same yr IC/PBS diagnosis	8/59 (14)	
Laparoscopy after IC/PBS diagnosis	16/59 (27)	
Cystoscopy with hydrodistention	87/87 (100)	1.9 (range, 0–5)
≥3 cystoscopies with hydrodistention	22/87 (25)	

Abbreviation as in Table 1.

upon q-tip swab testing at the 5- and 7-o'clock positions, indicating vestibulodynia. Vaginal examination of pelvic floor muscles revealed 94.2% with levator pain (Table 2).

Pelvic Surgeries and Procedures

Women averaged 4.4 pelvic surgeries, with 23% having 3 or more pelvic surgeries. Most (58%) were before IC/PBS diagnosis, with 33% done postdiagnosis. A total of 48% had a hysterectomy, two-thirds of which were done before IC/PBS diagnosis. Of the women studied, 42.5% had laparoscopies, 59% of which were done before IC/PBS diagnosis. All women had cystoscopies, with 25% having 3 or more (Table 2).

IC/PBS Symptoms

Mean urinary frequency was 16.3, nocturia was 3.1, and initial visit pain level was 5 out of 10. More than 60% had had pain for more than 5 years, describing it as constant, whereas approximately 40% reported burning

or pressure pain. Pain triggers included a surgery (25%) and bladder infection (23%) (Table 3). Pain was relieved with medications (52.5%), heat (34.6%), relaxation techniques (25.6%), or nothing (10.3%). Women reported an acceptable pain level to be 1.8 out of 10.

Sexual Pain History

Two-thirds (67%) of patients were currently sexually active; however, 77% reported deep pain (at a level of 6 out of 10) with sex (Table 3). A total of 69% reported burning pain with or after sex (68%). Pelvic pain lasting hours or days after sex affected 71% (pain level of 5.0).

Comorbidities

Comorbidities included pelvic pain (93%), allergies (86.2%), and sexual dysfunction (72.4%). More than 60% had dyspareunia and vulvodynia, and more than 40% reported constipation, irritable bowel syndrome

Table 3. IC/PBS symptoms and sexual pain history

Variable	No. (%)	Mean
Daytime frequency	79/87 (91)	16.3 (range, 4–60)
Nighttime frequency	83/87 (95)	3.1 (range, 0–25)
No. with implanted neuromodulation	16/87 (18.3)	
Pain level at visit (10-point VAS)	87/87 (100)	5 (range, 0–10)
Duration of pain >5 yr	53/87 (61)	
Duration of pain 3–5yr	4/87 (4.6)	
Duration of pain 1–3 yr	22/87 (25.3)	
Duration of pain 0–1 yr	8/87 (9)	
Event triggering pain	36/61 (59) yes	
Surgery	14/57 (24.6)	
Bladder infection	13/57 (22.8)	
Stress	11/58 (19)	
Physical injury or fall	8/57 (14)	
Medical procedure	7/57 (12.3)	
Sexual activity	7/58 (12.1)	
Vaginal infection	4/57 (7)	
Description of pain		
Constant	55/87 (63.2)	
Burning	35/87 (40.2)	
Pressure	34/87 (39.1)	
Aching	20/87 (23)	
Throbbing	10/87 (11.5)	
Like glass inside	6/87 (6.9)	
Pain relief with:		
Medications	42/80 (52.5)	
Heat	27/78 (34.6)	
Relaxation techniques	20/78 (25.6)	
Position change/exercise	15/77 (19.5)	
Nothing	8/78 (10.3)	
Acceptable pain level (10-point VAS)	83/87 (95)	1.8 (range, 0–5)
Sexual pain history		Pain on VAS (10 points)
Is sexually active now	56/83 (67)	6.1
Has deep pain with sex	67/87 (77)	4.7
Has burning pain with sex	60/87 (69)	5.0
Has burning pain after sex	59/87 (68)	5.0
Has pelvic pain for hours or days after sex	62/87 (71)	

VAS = visual analog scale.

(IBS), and stress urinary incontinence. Fibromyalgia affected 16.9% (Table 4).

Childhood History

One-third of these women reported childhood constipation and 28.9% reported a history of urinary tract infections (UTIs). Twenty percent had childhood pain with urination and 14.3% had been bedwetters (Table 4).

Family History

Irritable bowel syndrome affected 10.3% of sisters and 8% of mothers of these women. Two fathers (2.2%) and 1 brother (1.1%) were affected by IBS. Fibromyalgia affected 6.9% of sisters and 2.2% of mothers. Two sisters and 1 mother had IC/PBS. Chronic pain and lupus affected 2 and 1 sister, respectively (Table 4).

Abuse History

More than half of these women had a history of abuse (Table 4). Of those abused, half were sexually abused as a child (birth to age 12) and 16.7% were sexually abused as adolescents (age 13 to 17). Many were sexually abused

in more than one life stage. Date rape was reported by 17% of the abused women; 42.9% were victims of domestic violence. Physical abuse affected 65.3% and emotional abuse affected 80% of those abused. This abuse occurred at various life stages.

COMMENT

To our knowledge, this is the first cohort study of women with IC/PBS who were diagnosed by board-certified urologists and had a history and exam done by the same clinician to characterize their historical and clinical characteristics. This group's demographics were similar to synthesized data studies⁶; however, the literature revealed no articles on reproductive history and IC/PBS including the type of birth, tears/episiotomy, and birth weight or their relationship to diagnosis. The Interstitial Cystitis Database Study (ICDB),¹⁰ a multicenter prospective observational study, collected extensive data on IC/PBS. One study using the ICDB reported no relationship of symptom onset to pregnancy in 63% of the women, whereas 22% had symptoms before their first pregnancy.¹¹

Table 4. Co-morbidities—childhood, family, and abuse history

Comorbidities								
Pelvic pain								80/86 (93%)
Overall allergies								75/87 (86.2%)
Female sexual dysfunction								63/87 (72.4%)
Dyspareunia								58/83 (69.9%)
Vulvodynia								50/83 (60.2%)
Constipation								44/84 (52.4%)
IBS								41/84 (48.8%)
SUI								36/87 (41.4%)
UUI								33/87 (37.9%)
Fibromyalgia								14/83 (16.9%)
History of eating disorder								7/84 (8.3%)
Vaginismus								5/81 (6.2%)
Childhood history								
Constipation								27/81 (33.3%)
UTIs								24/83 (28.9%)
Pain w/urination								17/81 (21%)
Bedwetting								12/84 (14.3%)
Family history and responses								
IBS								Sister 9/87 (10.3%)
								Mother 7/87 (8%)
								Dad 2/87 (2.2%)
								Brother; MGM 1/87 each (1.1%)
Fibromyalgia								Sister 6/87 (6.9%)
								Mom 2/87 (2.2%)
								Sister 2/87 (2.2%)
IC/PBS								Mom 1/87 (1.1%)
Chronic pain								Sister 2/87 (2.2%)
Lupus								Sister 1/87 (1.1%)
Abuse	Overall	Childhood	Adolescent	Adult	Child + Adolescent	Child + Adult	Adolescent + Adult	All 3 Age Levels
Abuse history	44/86 (51.2%)							
Sexual abuse	28/48 (58.3%)	15/30 (50%)	5/30 (16.7%)	0/48 (0%)	5/30 (16.7%)	1/30 (3.3%)	1/30 (3.3%)	1/30 (3.3%)
Physical abuse	32/49 (65.3%)	6/35 (17.1%)	2/35 (5.7%)	9/35 (25.7%)	4/35 (11.4%)	2/35 (5.7%)	2/35 (5.7%)	7/35 (20%)
Domestic violence	21/49 (42.9%)							
Date rape	8/47 (17%)							
Emotional abuse	40/50 (80%)	6/41 (14.6%)	2/41 (4.9%)	9/41 (22%)	8/41 (19.5%)	2/41 (4.9%)	1/41 (2.4%)	12/41 (29.3%)

More than one-quarter of our cohort had had cesarean births and 76% had had a miscarriage, abortion, or stillbirth. Any relationship between IC/PBS and pregnancy and birth needs more research.

With current knowledge of IC/PBS, pelvic floor dysfunction (PFD), and innervation,¹² clinicians should consider birth weight, trauma, type of birth, vulvodynia, pelvic surgeries, and abuse history. Most women had vulvodynia upon exam. Almost one-quarter stated that their pain trigger was a surgery. Subjects averaged four lifetime pelvic surgeries. Almost half had had hysterectomies, higher than the nationwide rate of 5.5 hysterectomies per 1000.¹³ Most pelvic surgeries (58%) and hysterectomies (66%) were done were before IC/PBS diagnosis. A total of 94.2% had levator pain with examination. This mirrors the symptom severity of IC/PBS in our population and is a limitation of this study that may not reflect all IC/PBS patients. Women with chronic pain, frequency, and urgency are most challenging in developing a successful plan of care. Characterizing these patients may help clinicians reevaluate their history and treatment protocols, leading to better care.

The menstrual cycle pain data correlate with previous studies noting premenstrual pain¹²; however, we describe pain levels remaining throughout the menstrual cycle in more than 80% of these premenopausal women. The chlamydia history (11.9%) is higher than the 2005 rate of reported chlamydia among women in the United States (496.5 cases per 100,000 women).¹⁴ Women with positive chlamydia culture histories stated they were treated with subsequent negative cultures, but the duration of infection before treatment is unknown. Any impact of STIs on IC/PBS remains undetermined. Most women had negative urine cultures, wet mount slides, and normal vaginal pH. Yeast infections (more than 3 per year) were reported by 30%, and an unclear association with flared IC/PBS or comorbid symptoms such as vulvodynia, the fourth most common IC/PBS-associated symptom affecting 25% of women,¹⁵ and yeast¹⁶ remains.

The comorbidities were similar to those documented.^{1,6,10} However, this cohort reported twice as many allergies. IBS and fibromyalgia were reported more often (2 times and 1.5 times, respectively) than the ICDB.¹⁰ Female sexual dysfunction and dyspareunia affected 70% of our cohort. Two-thirds are currently sexually active, with at least two-thirds reporting deep pain with sex, burning with or after sex, or pelvic pain for hours after sex. This burning pain may be related to vulvodynia, found in more than half of these women. Deep pain with sex may be related to levator pain or PFD. Clinicians must be aware that treatment for vulvodynia¹⁷ and PFD¹⁸ differs from therapies used for IC/PBS. Sexual functioning is a primary predictor of mental quality of life in women with IC/PBS⁵ and should be evaluated and treated.

Childhood history data based on patient recall is limited. Approximately 30% recalled having constipation and UTIs as children and 1 of 5 recalled pain with

urination. The association of childhood symptoms with IC/PBS later in life is unknown. Family histories showed a higher proportion of female relatives affected by IBS, fibromyalgia, IC/PBS, chronic pain, and lupus than the male relatives. The prevalence of self-reported IC/PBS in first-degree relatives is consistent with previous research (3.9%).¹⁹ The IBS rate in first-degree relatives was 21.8%, lower than in the ICDB (26.3%). The fibromyalgia rate was 1.2%, higher than the ICDB.

The IC/PBS symptoms reflect ICDB findings, with patients' urinary frequency greater than 15 times per day and 3 times at night. Because our hospital is a large referral center for IC/PBS, 18.5% had implanted neuromodulation for urgency or frequency. A separate analysis of this subgroup was not included because this report's purpose was to provide an overview of the entire cohort. The mean pain level was 5, with 60% having this pain for 5 or more years. Initial pain triggers included surgery, bladder infection, stress, physical injury, medical procedure, sexual activity, or vaginal infection. The etiology remains unknown and perhaps varies for different people. Many theories abound¹ but a high proportion of this cohort had many lifetime surgeries, levator pain, female sexual dysfunction, abuse history, vulvodynia, constipation, and IBS. Medications helped only half of these women to relieve pain, so PFD and neural upregulation may relate more appropriately to the etiology of their symptoms than an altered glycosaminoglycan layer. Interestingly, 34.6% reported pain relief with heat, and 25.6% with relaxation techniques (ie, guided imagery). Prospective research starting in childhood is needed in relation to PFD, voiding habits, abuse, stress, and family history in terms of the prevention or development of IC/PBS.

A recent study found significantly more women with overactive bladder report sexual and physical abuse compared with women who were asymptomatic for urinary symptoms or who had stress urinary incontinence.²⁰ The Center for Disease Control and Prevention 2005 statistics²¹ reported 14% of U.S. children experienced some type of abuse: 8% experienced sexual abuse, 48% physical abuse, and 75% emotional abuse. One in five female high school students reports being physically and/or sexually abused by a dating partner.²² More than half of our cohort had been abused at least once in their lives, concurring with findings from a study of women with chronic pelvic pain.²³ One-third of the women had post-traumatic stress disorder (PTSD) and their abuse history was related to poor health, more medical symptoms, lifetime surgeries, and dysfunction due to pain. We recently published a report describing in detail abuse in women with interstitial cystitis, noting that perhaps trauma related to abuse could be a trigger for neuropathic or myofascial pain found in many with IC/PBS.²⁴ However, more research is needed to ascertain whether the time the abuse occurred and the types of abuse are directly related to IC/PBS symptoms. Because abuse is so

prevalent in our society and specifically among women with IC/PBS, it is imperative that clinicians ask about abuse and offer appropriate referrals.

CONCLUSIONS

Our comprehensive overview of women with IC/PBS provides a framework to guide clinicians' assessment and treatment plans. This population of women with unrelieved chronic pain, frequency, and urgency is in desperate need of care. As researchers continue to search for the etiology, prevention, and treatment of IC/PBS, it may be therapeutic to develop multimodal care plans that include physical therapy, oral and intravesical therapies, neuromodulation, and cognitive-behavioral therapies based on comprehensive histories and exams.

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References

- Hanno P: Painful bladder syndrome/interstitial cystitis and related disorders, in Wein AJ, Kavoussi LR, Novick AC, *et al* (Eds): *Campbell's Urology*, 9th ed. Philadelphia, Saunders Elsevier, 2006, pp. 1–57.
- Proper KJ, Schaeffer AJ, Brensinger CM, *et al*: A prospective study of interstitial cystitis: results of longitudinal followup of the Interstitial Cystitis Data Base Cohort. *J Urol* **163**: 1434–1439, 2000.
- Ottum DP, Carr LK, Perks AE, *et al*: Interstitial cystitis and female sexual dysfunction. *Urology* **69**: 608–610, 2007.
- Peters KM, Killinger KA, Carrico DJ, *et al*: Sexual function and sexual distress in women with interstitial cystitis: a case-control study. *Urology* **70**: 543–547, 2007.
- Nickel JC, Tripp D, Teal V, *et al*: Sexual function is a determinant of poor quality of life for women with treatment refractory interstitial cystitis. *J Urol* **177**: 1832–1836, 2007.
- Teichman JM, and Parsons CL: Contemporary clinical presentation of interstitial cystitis. *Urology* **69(Suppl 4A)**: 41–47, 2007.
- Parsons JK, Kurth K, and Sant GR: Epidemiologic issues in interstitial cystitis. *Urology* **69(Suppl 4A)**: 5–8, 2007.
- Schaeffer AJ, Landis JR, Knauss JS, *et al*: Demographic and clinical characteristics of men with chronic prostatitis: the National Institutes of Health Chronic Prostatitis Cohort Study. *J Urol* **168**: 593–598, 2002.
- Ashur ML. Asking about domestic violence: SAFE questions. *JAMA* **269**: 2367, 1993.
- Simon LJ, Landis JR, Erickson DR, *et al*: The Interstitial Cystitis Data Base (ICDB): concepts and preliminary baseline descriptive statistics. *Urology* **49(Suppl 5A)**: 64–75, 1997.
- Erickson DR, and Proper KJ: Pregnancy and interstitial cystitis/painful bladder syndrome. *Urol Clin North Am* **34**: 61–69, 2007.
- Butrick C: Interstitial cystitis and chronic pelvic pain: new insights in neuropathology, diagnosis, and treatment. *Clin Obstet Gynecol* **46**: 811, 2003.
- Keshavarz H, Hillis SD, Kieke BA, *et al*: Hysterectomy surveillance: United States, 1994–1999. CDC: MMWR Surveillance Summaries, 51(SS05): 1–8, 2002. Available at: <http://www.cdc.gov/MMWR/preview/mmwrhtml/ss5105a1.htm#fig1>. Accessed May 7, 2007.
- Centers for Disease Control and Prevention, Department of HHS, Atlanta, GA. Chlamydia: STD Surveillance 2005 National Profile. Available at: <http://www.cdc.gov/std/stats/chlamydia.htm>. Accessed: May 4, 2007.
- Alagiri M, Chottiner S, Ratner V, *et al*: Interstitial cystitis: unexplained associations with other chronic disease and pain syndromes. *Urology* **49(Suppl 5A)**: 52–57, 1997.
- Mann M, Kaufman R, Brown D Jr, *et al*: Vulvar vestibulitis: significant clinical variables and treatment outcome. *Obstet Gynecol* **79**: 122–125, 1992.
- Reed B: Vulvodynia: diagnosis and management. *Am Fam Physician* **73**: 1231–1238, 2006.
- Weiss J: Pelvic floor myofascial trigger points: manual therapy for interstitial cystitis and the urgency-frequency syndrome. *J Urol* **166**: 2226–2231, 2001.
- Warren JW, Jackson TL, Langenberg P, *et al*: Prevalence of interstitial cystitis in first-degree relatives of patients with interstitial cystitis. *Urology* **63**: 17–21, 2004.
- Jundt K, Scheer I, Schiessl B, *et al*: Physical and sexual abuse in patients with overactive bladder: is there an association? *Int Urogynecol J* **18**: 449–453, 2007.
- Centers for Disease Control and Prevention. Child maltreatment: facts at a glance. Available at: http://www.cdc.gov/ncipc/dvp/cm_data_sheet.pdf. Accessed: May 7, 2007.
- Silverman JG, Raj A, Mucci LA, *et al*: Dating violence against adolescent girls and associated substance use, unhealthy weight control, sexual risk behavior, pregnancy, and suicidality. *JAMA* **286**: 572–579, 2001.
- Meltzer-Brody S, Leserman J, Zolnoun D, *et al*: Trauma and post-traumatic stress disorder in women with chronic pelvic pain. *Obstet Gynecol* **109**: 902–908, 2007.
- Peters KM, Kalinowski SE, Carrico DJ, *et al*: Fact or fiction: is abuse prevalent in patients with interstitial cystitis? Results from a community survey and clinic population. *J Urol* **178**: 891–895, 2007.