

## Voiding Dysfunction

# Correlations of Interstitial Cystitis/Painful Bladder Syndrome with Female Sexual Activity

Hyun Suk Yoon, Hana Yoon

Department of Urology, School of Medicine, Ewha Womans University, Seoul, Korea

**Purpose:** We investigated how the symptoms of interstitial cystitis/painful bladder syndrome (IC/PBS) are correlated with the sexual activity of these patients.

**Materials and Methods:** A total of 87 patients were included in this study; 18 patients were diagnosed with IC and the other 69 had PBS. The diagnosis was made on the basis of the concept of IC/PBS proposed by the ICS in 2002. Patients were asked to fill in a Bristol female lower urinary tract symptom questionnaire, and symptoms were rated on a scale of from 1 to 4 or 5. Pearson's correlation coefficient was used to analyze the correlation of pain and urinary symptoms with quality of life and sexual activity.

**Results:** The average age of the patients was  $51 \pm 14.7$  years (range, 28-74 years). Age and vulvodynia were positively correlated with one another ( $r=0.232$ ), and there was a negative correlation between age and dyspareunia ( $r=-0.302$ ). Among the items regarding IC/PBS and sexual activity, frequency showed a positive correlation with vulvodynia ( $r=0.258$ ) in addition to an inhibited sex life ( $r=0.403$ ). Urgency showed a positive correlation with an inhibited sex life ( $r=0.346$ ). Vulvodynia showed a positive correlation with an inhibited sex life ( $r=0.259$ ) and dyspareunia ( $r=0.401$ ). The main symptoms of IC/PBS (frequency, urgency, and pelvic pain) showed a positive correlation with almost all items related to quality of life ( $p < 0.05$ ).

**Conclusions:** Frequency, urgency, and various types of pain are negatively correlated with the sexual activity of patients. This suggests that physicians should consider sexual function in the management of patients with IC/PBS.

**Key Words:** Interstitial cystitis, Sexual behavior, Quality of life

### Article History:

received 5 August, 2009

accepted 20 October, 2009

### Corresponding Author:

Hana Yoon  
Department of Urology, School of  
Medicine, Ewha Womans University,  
911-1, Mok-dong, Yangcheon-gu,  
Seoul 158-710, Korea  
TEL: +82-2-2650-5157  
FAX: +82-2-2654-3682  
E-mail: wowhana@ewha.ac.kr

## INTRODUCTION

Interstitial cystitis/painful bladder syndrome (IC/PBS) is a common female urological disease that is a chronic syndrome characterized by the presence of pain in the urinary bladder and pelvis accompanied by frequency, urgency, and nocturia [1]. Treatments for these symptoms include behavioral therapy, pharmacotherapy, physical therapy, and injection therapy [2,3], but transient and palliative treatments are commonly performed [4]. These conditions aggravate the mental health as well as the physical function of patients and also impair the patients' overall quality of life [5].

Impaired sexual function has been reported to be more prevalent in women who have IC/PBS [6]. According to one study, at least 54% of women with IC/PBS responded that they refused to have sexual intercourse [7,8]. More than 70% of patients with interstitial cystitis responded that the

disease had a detrimental effect on their sex lives [9]. As one of the causative factors of these reports, the relation between pain and sexual function has received increased interest in recent years.

We conducted a questionnaire-based, cross-sectional study to examine in detail whether pain and voiding symptoms are correlated with the sex lives of patients with IC/PBS.

## PATIENTS AND METHODS

A total of 87 female patients diagnosed with IC/PBS after visiting the bladder clinic of our medical institution for voiding difficulty from March 2005 to February 2007 were enrolled in the current study. Of these patients, 39 patients were menopausal and 3 of them were treated with hormone replacement therapy. A diagnosis of IC/PBS was made on the basis of the concept of IC/PBS proposed by the ICS in

2002 [10], for which medical history, urinalysis, voiding diaries, voiding cystourethrography, cystoscopy, urine cytology, and urodynamic studies were used. The number of patients who underwent cystoscopy and hydrodistention was 36 (41.4%). Interstitial cystitis was diagnosed in 18 patients on the basis of the presence of congestion or glomerulation. The remaining 67 patients had cases of painful bladder syndrome. Each patient was asked to fill out a Bristol female lower urinary tract symptom (BFLUTS) questionnaire [11].

The questionnaire was translated into Korean and its validity was authenticated [12]. The Korean version of the questionnaire comprised 34 questions (20 questions about voiding symptoms, 4 questions about sexual activity, and 10 questions about daily activities). Each symptom was scored by using a 4- or 5-point scale based on the corresponding criteria that a higher score was correlated with the severity of symptoms. Every patient answered 'yes' to having 'recent sexual activity.' To identify the correlations between the categories indicating voiding symptoms or pain severity and those associated with sexual activity, an age-adjusted partial correlation analysis (age-adjusted Pearson correlation test) was performed. To analyze the correlation between menopause and pain and sexual symptoms, independent t-tests were used. A statistical analysis was performed by using SPSS 15.0, and values of  $p < 0.05$  were considered statistically significant.

## RESULTS

The mean age of the patients was  $51.0 \pm 14.7$  years (range, 28-74 years), and at the time of diagnosis the mean disease duration was  $103 \pm 21.2$  days (range, 63-147 days).

Correlations between patient age, pain in the pelvic

area, and sex life were examined. A mild positive correlation was found between patient age and vulvodynia ( $r=0.232$ ,  $p=0.045$ ). There was a moderate negative correlation between age and dyspareunia ( $r=-0.302$ ,  $p=0.008$ ).

Differences in symptoms related to pain, IC/PBS, and sexual activity between non-menopausal women and menopausal women were analyzed by use of the independent t-test (Table 1). The symptoms of patients treated with hormone replacement therapy were not significantly different from those of the other menopausal women ( $p > 0.05$ ). The average age of the non-menopausal women was  $40.93 \pm 6.83$  years (range, 28-54 years) and that of the menopausal women was  $59.83 \pm 6.67$  years (range, 49-74 years). Vulvodynia scores were worse in menopausal women than in non-menopausal women ( $0.76 \pm 1.05$  vs.  $1.27 \pm 1.07$ ,  $p=0.047$ ) but dyspareunia scores were better ( $1.69 \pm 1.13$  vs.  $1.03 \pm 1.17$ ,  $p=0.016$ ).

Correlations between age-adjusted symptoms of IC/PBS and sexual activity were examined. Frequency was positively correlated with vulvodynia ( $r=0.258$ ,  $p=0.038$ ) and with discomfort with one's sex life ( $r=0.403$ ,  $p=0.001$ ). There was also a positive correlation between urgency and discomfort with sexual activity ( $r=0.346$ ,  $p=0.005$ ). Correlations between pelvic pain and sex life were examined and only vulvodynia showed a positive correlation ( $r=0.259$ ,  $p=0.037$ ) (Table 2).

Age-adjusted comparisons of symptoms related to sexual life were made in association with the symptoms associated with pain. Inhibited sex life ( $r=0.491$ ,  $p < 0.001$ ) and dyspareunia ( $r=0.401$ ,  $p=0.001$ ) showed positive correlations with vulvodynia (Table 3). Dyspareunia had positive correlations with vulvodynia ( $r=0.401$ ,  $p=0.001$ ), inhibited sex life ( $r=0.604$ ,  $p < 0.001$ ), and leakage during sexual intercourse ( $r=0.400$ ,  $p < 0.001$ ).

**TABLE 1.** Correlation between menopause and factors related to pain and sexual activity

	Premenopause	Menopause	p-value
No. of patients	48 (55.2%)	39 (44.8%)	
Mean age	$40.93 \pm 6.83$	$59.83 \pm 6.67$	$< 0.001^a$
Pelvic pain	$1.30 \pm 1.01$	$1.33 \pm 1.37$	0.717
Dysuria	$0.73 \pm 0.85$	$0.98 \pm 1.11$	0.435
Vulvodynia	$0.76 \pm 1.05$	$1.27 \pm 1.07$	$0.047^a$
Inhibited sex life	$1.45 \pm 1.15$	$1.24 \pm 1.28$	0.302
Dyspareunia	$1.69 \pm 1.13$	$1.03 \pm 1.17$	$0.016^a$
Urinary leakage during intercourse	$1.05 \pm 0.74$	$0.71 \pm 0.68$	0.052

Independent t-test. <sup>a</sup>:  $p < 0.05$

**TABLE 2.** Relationship of IC/PBS symptoms with sexual activity factors

	Vulvodynia	Inhibited sex life	Dyspareunia	Urinary leakage during intercourse
Frequency	$0.258^a$	$0.403^a$	0.087	-0.154
Urgency	0.188	$0.346^a$	0.242	0.071
Pelvic pain	$0.378^a$	0.150	0.259	0.115

Age-adjusted Pearson correlation test. IC/PBS: interstitial cystitis/painful bladder syndrome, <sup>a</sup>:  $p < 0.05$

**TABLE 3.** Correlation between symptoms related to pain and sexual activity symptoms

	Vulvodynia	Inhibited sex life	Dyspareunia	Urinary leakage during intercourse
Dysuria	0.398	0.118	0.142	0.048
Vulvodynia	1.000	0.491 <sup>a</sup>	0.401 <sup>a</sup>	0.050
Dyspareunia	0.401 <sup>a</sup>	0.604 <sup>a</sup>	1.000	0.400 <sup>a</sup>

Age-adjusted Pearson correlation test. <sup>a</sup>:  $p < 0.05$

**TABLE 4.** Relationship of IC/PBS symptoms and QoL symptoms

	Frequency	Urgency	Pelvic pain
Cut down fluids	0.187	0.252	0.037
Affect daily tasks	0.410 <sup>a</sup>	0.377 <sup>a</sup>	0.308 <sup>a</sup>
Avoid situations with limited access to washrooms	0.425 <sup>a</sup>	0.484 <sup>a</sup>	0.270 <sup>a</sup>
Interference with physical activities	0.194	0.359 <sup>a</sup>	0.165
Interference with social life	0.502 <sup>a</sup>	0.466 <sup>a</sup>	0.197
Overall interference with life	0.464 <sup>a</sup>	0.442 <sup>a</sup>	0.294 <sup>a</sup>
Spend rest of life with no change	0.359	0.275 <sup>a</sup>	0.223 <sup>a</sup>

Age-adjusted Pearson correlation test. IC/PBS: interstitial cystitis/painful bladder syndrome, QoL: quality of life, <sup>a</sup>:  $p < 0.05$

An analysis of items related to symptoms of IC/PBS and lifestyle were also made. Frequency affected daily tasks ( $r=0.410$ ,  $p=0.001$ ), travel ( $r=0.425$ ,  $p < 0.001$ ), social life ( $r=0.502$ ,  $p < 0.001$ ), and overall life activities ( $r=0.464$ ,  $p < 0.001$ ). It also had a detrimental effect on the quality of life ( $r=0.359$ ,  $p=0.003$ ). Urgency showed a significant positive correlation with daily life activities ( $r=0.377$ ,  $p=0.002$ ), travel ( $r=0.484$ ,  $p < 0.001$ ), physical activity ( $r=0.359$ ,  $p=0.003$ ), social life ( $r=0.466$ ,  $p < 0.001$ ), overall life ( $r=0.442$ ,  $p < 0.001$ ), and quality of life ( $r=0.275$ ,  $p=0.023$ ). Pelvic pain showed a correlation with daily life ( $r=0.308$ ,  $p=0.011$ ), restricted travel ( $r=0.270$ ,  $p=0.026$ ), and impairment of overall life ( $r=0.294$ ,  $p=0.015$ ); in addition, it showed a correlation with quality of life ( $r=0.223$ ,  $p=0.034$ ) (Table 4).

## DISCUSSION

The etiology of sexual dysfunction is assumed to be various in patients with IC/PBS, and the development of pain may be one cause. In addition to pelvic pain, many researchers have reported that chronic pain leads to sexual dysfunction. According to one study, sexual dysfunction was present in 73% of male and female patients with chronic pain [13]. According to another study, the greater the severity of pain, the greater the degree of sexual dysfunction [14].

Similar results have been observed in patients with chronic prostatitis/chronic pelvic pain syndrome, of whom 25% complained of erectile dysfunction, 33.4% complained of ejaculatory dysfunction, and 41.6% complained of both [15]. The patients who had both erectile dysfunction and ejaculatory dysfunction were found to have severe chronic prostatitis/chronic pelvic pain syndrome [15]. According to a study conducted by Aubin et al [16], when a comparison

was made between 72 male patients with type 3 chronic pelvic pain syndrome and 98 normal, asymptomatic controls, the patient group had high incidence of lower sexual desire and a lower frequency of sexual intercourse than the control group. Also in the patient group, the degree of arousal response was relatively low. Rosenbaum reported that the pelvic muscles are involved in arousal and orgasms in both male and female patients [17]. The authors noted that the pelvic hypertonus muscles were important constituents for provoking the occurrence of dyspareunia. In this study, the severity of symptoms (such as pelvic pain, vulvodynia, and dyspareunia) caused increased symptoms associated with sexual function.

Pain and fear induce tension in pelvic muscles and the disorder of intravulvar insertion in women. This leads to dyspareunia and trauma in the vagina and external genitalia [18]. During sexual intercourse, physical irritation to the urethra and urinary bladder causes discomfort and increases the symptoms of IC/PBS [8,19]. From an embryological perspective, there is a relationship between urinary system problems and reproductive system problems in that one system can contribute to the development of problems in the other [8,19]. From a neurophysiological perspective, once the inflammatory stimulations are repeated, they cause pain following chronic changes in neurotransmission, mechanisms of pain control, and tissue responses [20]. These stimulatory factors affect the mechanisms associated with pain. A persistent presence of these stimulations converts the pelvic pain to neurological pain (which eventually leads to chronic pain syndrome), contributing to the impairment of sexual function [18]. These theories can be confirmed on the basis of the significant correlations between pelvic pain, voiding pain, vulvodynia, and dyspareunia.

In the present study, the occurrence of dyspareunia was

shown to have a tendency to decrease with age ( $r = -0.302$ ,  $p = 0.008$ ), compared with other types of pain for which occurrence increases with age. Menopausal women also showed worse pain during intercourse than did non-menopausal women. Although the frequency of sexual intercourse was not measured, the above results might originate from the fact that the frequency of sexual intercourse and sexual interest decrease with age.

No current studies have established the etiology of IC/PBS, and the sexual dysfunction of IC/PBS patients may be hypothesized to result from a combination of complex factors, including physical, psychological, and social factors. As shown in this study, IC/PBS contributes to the impairment of sexual function to some extent. In women with chronic interstitial cystitis, sexual dysfunction was more prevalent than in healthy women and was shown to impair the quality of life [6].

An analysis of the responses to the current study questionnaire showed that 44.0% of the respondents had no vulvodynia. In regard to the effects of voiding-related problems on sexual dysfunction, 25.6% had no sexual intercourse, 38.5% had no problems with sexual intercourse, and 33.8% had no dyspareunia. A total of 40.3% of the patients experienced urinary incontinence during sexual intercourse. These findings cannot confirm the correlation of IC/PBS with the sex lives of patients. However, frequency, urgency, and pelvic pain were correlated with vulvodynia and impaired sex life. These results indicate that symptoms of IC/PBS are closely associated with symptoms associated with sexual life.

This study had some limitations. First, this was a cross-sectional study. A case-control study or cohort study may reveal more accurate results. Second, the BFLUTS questionnaire was designed to investigate the severity and adverse effects of lower urinary tract symptoms. For a more accurate evaluation, adding other questionnaires to represent female sexual function (e.g., female sexual function index) could be helpful.

According to some studies, treatment of patients with IC/PBS results in improved sexual function and quality of life. Nickel et al reported that sexual function was the key factor in determining the quality of life in elderly patients with interstitial cystitis [1]. The authors also noted that the goal of treatment should focus on sexual dysfunction and stated that the improvement of symptoms of IC/PBS should accompany improvement of sexual function [21]. In patients with sexual dysfunction presenting with IC/PBS, treatment should be approached in many directions, including psychological and social aspects; additionally, consultation with specialists in relevant fields may be beneficial.

## CONCLUSIONS

Bladder pain and lower urinary tract symptoms (LUTS) related to IC/PBS had a negative correlation with sexual function. Physicians should consider not only pain relief

and control of LUTS but also sexual life improvement when counseling or treating patients with IC/PBS.

## REFERENCES

1. Nickel JC, Tripp D, Teal V, Propert KJ, Burks D, Foster HE, et al. Sexual function is a determinant of poor quality of life for women with treatment refractory interstitial cystitis. *J Urol* 2007;177:1832-6.
2. Nickel JC. Interstitial cystitis: a chronic pelvic pain syndrome. *Med Clin North Am* 2004;88:467-81.
3. Chung JW, Han DH, Lee KS. Efficacy and safety of sacral neuromodulation (Interstim<sup>®</sup>) for the treatment of refractory overactive bladder symptoms and chronic pelvic pain. *Korean J Urol* 2007;48:701-5.
4. Walsh A. Historical perspectives. In: Hanno PM, Staskin DR, Krane RJ, editors. *Interstitial cystitis*. New York: Springer-Verlag; 1990;17.
5. Slade D, Ratner V, Chalker R. A collaborative approach to managing interstitial cystitis. *Urology* 1997;49(5A Suppl):10-3.
6. Peters KM, Killinger KA, Carrico DJ, Ibrahim IA, Diokno AC, Graziottin A. Sexual function and sexual distress in women with interstitial cystitis: a case-control study. *Urology* 2007;70:543-7.
7. Webster DC, Brennan T. Use and effectiveness of sexual self-care strategies for interstitial cystitis. *Urol Nurs* 1995;15:14-22.
8. Kellogg-Spatt S, Albaugh JA. Intimacy and bladder pain: helping women reclaim sexuality. *Urol Nurs* 2002;22:355-6.
9. Tincello DG, Walker AC. Interstitial cystitis in the UK: results of a questionnaire survey of members of the Interstitial Cystitis Support Group. *Eur J Obstet Gynecol Reprod Biol* 2005;118:91-5.
10. Abrams P, Cardozo L, Fall M, Griffiths D, Rosier P, Ulmsten U, et al. The standardization of terminology of lower urinary tract function: report from the standardisation sub-committee of the international continence society. *Am J Obstet Gynecol* 2002;187:116-26.
11. Brookes ST, Donovan JL, Wright M, Jackson S, Abrams P. A scored form of the Bristol Female Lower Urinary Tract Symptoms questionnaire: data from a randomized controlled trial of surgery for women with stress incontinence. *Am J Obstet Gynecol* 2004;191:73-82.
12. Oh SJ, Park HG, Paick SH, Park WH, Choo MS. Translation and linguistic validation of Korean version of the Bristol Female Lower Urinary Tract Symptom instrument. *J Korean Continence Soc* 2004;8:89-113.
13. Ambler N, Williams AC, Hill P, Gunary R, Cratchley G. Sexual difficulties of chronic pain patients. *Clin J Pain* 2001;17:138-45.
14. Kwan KS, Roberts LJ, Swalm DM. Sexual dysfunction and chronic pain: the role of psychological variables and impact on quality of life. *Eur J Pain* 2005;9:643-52.
15. Lee SW, Liang ML, Yuen KH, Leong WS, Cheah PY, Khan NA, et al. Adverse impact of sexual dysfunction in chronic prostatitis/chronic pelvic pain syndrome. *Urology* 2008;71:79-84.
16. Aubin S, Berger RE, Heiman JR, Ciol MA. The association between sexual function, pain, and psychological adaptation of men diagnosed with chronic pelvic pain syndrome type III. *J Sex Med* 2008;5:657-67.
17. Rosenbaum TY. Pelvic floor involvement in male and female sexual dysfunction and the role of pelvic floor rehabilitation in treatment: a literature review. *J Sex Med* 2007;4:4-13.
18. Graziottin A. Sexual pain disorders: dyspareunia and vaginismus. In: Porst H, Buvat J, editors. *International society of sexual medicine standard committee book: standard practice in sex-*

- ual medicine. 1st ed. Oxford: Blackwell; 2006;342-50.
19. Myers DL, Aguilar VC. Gynecologic manifestations of interstitial cystitis. *Clin Obstet Gynecol* 2002;45:233-41.
  20. Persson K, Steers WD, Tuttle JB. Regulation of nerve growth factor secretion in smooth muscle cells cultured from rat bladder body, base and urethra. *J Urol* 1997;157:2000-6.
  21. Nickel JC, Parsons CL, Forrest J, Kaufman D, Evans R, Chen A, et al. Improvement in sexual functioning in patients with interstitial cystitis/painful bladder syndrome. *J Sex Med* 2008;5:394-9.