Epidemiology of Interstitial Cystitis and Chronic Pelvic Pain in Women: Review of the Literature

Yi-Ting Chen, M.D., Shih-Tien Hsu, M.D., Esther Shih-Chu Ho, M.D., Man-Jung Hung, M.D.

Department of Obstetrics and Gynecology, Taichung Veterans General Hospital, Taichung, Taiwan

CHRONIC PELVIC PAIN IN WOMEN

Chronic pelvic pain (CPP) in women is a common and complex condition which is associated with reduced quality of life and increased health-care costs [1]. In 2004, the American College of Obstetrics and Gynecology published a practice bulletin that defined CPP as non-cyclic pain of 6 months' duration or longer that localizes to the anatomic pelvis, abdominal wall at or below the umbilicus, lumbo-sacral back, or the buttocks and is of sufficient severity to cause functional disability or lead to medical care [2].

The management of CPP is challenging due to the multiple organ systems in the pelvic region, including the genital-urinary system, gastrointestinal system, musculo-skeletal system and psycho-neurological system (Table 1). The differential diagnosis includes endometriosis, endosalpingiosis, pelvic adhesions, ovarian remnant syndrome, interstitial cystitis (IC), adenomyosis and uterine leiomyomatas. These conditions may present with similar symptoms, and one or more may exist concomitantly [3].

According to a study conducted by Zondervan et al, the estimated prevalence of CPP is 3.8% in women aged 15-73 in the UK, which is higher than the prevalence of migraine (2.1%) and is similar to that of asthma (3.7%) and back pain (4.1%). In addition, the annual prevalence of CPP is 38.3/1,000 and the monthly prevalence rates increase significantly with age ($P<0.001$) from 18.2/1,000 in 15-20 year olds to 27.6/1,000 in women older than 60, as symptoms persist longer in older women. On the other hand, prevalence and incidence rates vary significantly between regions ($P<0.001$), with the lowest monthly prevalence in Scotland (16.0/1,000) and the highest in Wales (29.4/1,000) [4]. It has been reported that in primary care practices, 39% of women complain of pelvic pain, and 10% of all referrals to gynecologists are for CPP [5]. CPP also affects 14.7% (773/5,263) of women 18-50 years old in the US; however, 61% of these cases are of unknown etiology. Risk factors that affect women with CPP are age > 35, race, education and marital status [6].

A detailed history taking and systemic physical examination are the basis for management of CPP. Further diagnostic tests such as laboratory studies and pelvic ultrasound can be performed to evaluate the causes of CPP in women [3]. Gynecologic diagnostic laparoscopy is an invasive procedure and is performed in over 40% of patients with CPP [7]. Between 35% and 60% of these laparoscopic procedures reveal no evidence of pelvic pathology. The role of diagnostic laparoscopy in CPP is controversial [7,8]. There is no substantial data confirming the improved diagnostic accuracy or improved clinical outcomes with conscious laparoscopic pain mapping [9,10].

Chronic pelvic pain can be a serious and frustrating condition. Endometriosis, IC, pelvic adhesions and irritable bowel syndrome are the most common causes of CPP [3]. Recent studies have demonstrated that almost 80% of CPP cases are due to endometriosis. It has also been emphasized that pain of bladder origin or IC is a source of CPP [11].

Received: February 15, 2008 Accepted: April 10, 2008
Address correspondence to: Dr. Man-Jung Hung, Department of Obstetrics and Gynecology, Taichung Veterans General Hospital, 160, Section 3, Taichung Harbor Road, Taichung, 40705, Taiwan
E-mail: mjhung@vghtc.gov.tw

INTERSTITIAL CYSTITIS

Interstitial cystitis is thought to be multifactorial and progressive. The etiology of IC may involve bladder epithelial dysfunction, mast cell activation and bladder sensory nerve up-regulation. According to International Continence Society terminology, IC is a specific diagnosis and requires confirmation by typical cystoscopic and histological features. In the investigation of bladder pain, it may be necessary to exclude conditions such as carcinoma *in situ* and endometriosis [12]. The main clinical symptoms in IC patients are urinary frequency, urgency, nocturia, pelvic pain and dyspareunia, and these symptoms progress over time. Cystoscopic findings include mucosal glomerulations with or without ulcers after hydrodistension of the urinary bladder [13]. Early IC is more likely to involve absent or moderate pain

Table 1. Clinical conditions that may cause chronic pelvic pain in women [3]

Genital system	**Gastrointestinal system**
Adhesion	Carcinoma of the colon
Cyst	Bowel obstruction
Chronic ectopic pregnancy	Colitis
Chronic pelvic inflammation	Constipation
Endometriosis	Diverticular disease
Pelvic mass	Hernias
Residual ovary syndrome	Irritable bowel syndrome
Pelvic congestion syndrome	**Musculoskeletal system**
Adenomyosis	Myofascial pain
Leiomyomata	Chronic coccygeal pain
Symptomatic pelvic relaxation	Degenerative joint disease
Cervical stenosis	Disk herniation or rupture
Urinary system	Poor posture
Tumor	Hernias
Chronic urinary tract infection	Neoplasia of spinal cord or sacral nerve
Interstitial cystitis	Neuralgia
Radiation cystitis	Levator ani spasm
Urolithiasis	Degenerative joint disease
Urethral diverticulum	**Others**

when compared with classic IC. IC patients rarely present with gross histological changes. There are also no laboratory assays or biochemical markers associated with this syndrome. Patients may visit an average of 8 physicians and there is an average of 5-7 years from the onset of symptoms before an accurate diagnosis is made [14].

Oravisto published the first report on the prevalence of IC in 1975. This report indicated that the estimated population-based prevalence rate of IC was 18.1 per 100,000 women in Finland [15]. In 1990, Held et al reported the prevalence rate was 30 per 100,000 women in the US [16]. A higher prevalence rate of 865 per 100,000 women was suggested by the National Health Interview Survey based on patients' self-reports of IC diagnosis in 1997 [17]. Curhan et al concluded that the prevalence of IC in the US was substantially higher when compared with the prior Finnish estimate, and it had increased from 51 per 100,000 women in 1994 to 67 per 100,000 women in 1995 [14]. In contrast, Ito et al reported a lower prevalence rate of 4.5 per 100,000 women in Japan in 2000 [18]. The higher prevalence rates reported in recent studies may result from different diagnostic criteria among studies. IC is recognized as a relatively common disorder, and physicians are seeing a greater number of patients with IC in their practices. It has been noted that the prevalence rates vary with racial/ethnic and geographic differences in the distribution of the disease [19].

In the past, IC was a rare etiology associated with CPP in women. Reiter and Gambone reported that only 1.8% (1/57) of women with CPP and negative laparoscopic findings have IC [20]. Howard demonstrated a similar prevalence rate (2%) [21]. Parsons et al performed an intravesical potassium sensitivity test (PST) to assess the ratio of gynecological CPP associated with IC. The results revealed that 85% (114/134) of women with CPP had positive PST results. Among the 134 women tested, only 2.9% had been diagnosed as having IC [22]. Further study by Parsons et al showed that 81% (197/244) of patients with CPP had a positive PST result. Lower urinary tract symptoms were reported by 84% of the 244 patients, but only 1.6% of the patients had received an initial diagnosis of IC. In contrast, none of the 47 control subjects tested had a positive PST result [23]. But there is no data concerning the specificity or sensitivity of PST as a diagnostic test. PST has been restricted to use as a research tool [24].

Recent studies have suggested that the prevalence of IC is higher than estimated in the CPP population. A symptom questionnaire can be used to identify and record the presence of all IC symptoms, thus helping physicians to establish the diagnosis of IC. Leppilahti et al used the validated O'Leary-Sant Symptom and Problem Index to assess women who had significant bladder and pelvic symptoms without a confirmed diagnosis of IC. They found that the rate was 450 per 100,000 women [25]. Bladder-origin pain or IC is an important cause in the differential diagnosis of female CPP. A study published in 2002 stated that 38% (17/45) of women with CPP receiving concomitant laparoscopic and cystoscopic evaluation were diagnosed as having classical IC [26]. IC should be considered in women with symptoms of overactive bladder that do not respond well to anti-cholinergics, or have recurrent urinary tract infection, premenstrual pain or dysmenorrhea, dyspareunia and a history or suspicion of "endometriosis" [27].

Interstitial cystitis is often misdiagnosed when the strict National Institute of Diabetes and Digestive and Kidney Diseases criteria are used. IC is not commonly recognized until it reaches the advanced stage or a physician has high suspicion. Clinical diagnosis by exclusion and inclusion based on the history taking, physical examination, urinalysis, culture, the use of disease-specific questionnaires such as the O'Leary-Sant and the Pelvic Pain and Urgency/Frequency questionnaires, and the PST is helpful in identifying patients with early IC. Cystourethroscopy, urodynamic studies and laparoscopy are optional. If IC is diagnosed and appropriately managed early in the disease process, patients can be afforded a better quality of life [28].

CONCLUSION

The management of CPP is challenging due to the multiple organ systems in the pelvic region. The differential diagnosis includes endometriosis, endosalpingiosis, pelvic adhesions, ovarian remnant syndrome, adenomyosis, uterine leiomyomatas and IC. These conditions may present with similar symptoms, and one or more may exist concomitantly. In the past, IC was a rare etiology associated with CPP in women. Recent studies have suggested that the prevalence of IC is higher than estimated in the CPP population. We do not know if early diagnosis and treatment can alter the disease outcome, but the quality of life and family-patient-doctor relationship can be better.

REFERENCES

1. Gunter J: Chronic pelvic pain: An integrated approach to diagnosis and treatment. Obstet Gynecol Surv 2003; **58**:615-623.
2. ACOG Committee on Practice Bulletins—Gynecology: ACOG practice Bulletin No. 51 Chronic pelvic pain. Obstet Gynecol 2004; **103**: 589-605.
3. Howard FM: Chronic pelvic pain. Obstet Gynecol 2003; **101**:594-611.
4. Zondervan KT, Yudkin PL, Vessey MP, Dawes MG, Barlow DH, Kennedy SH: Prevalence and incidence of chronic pelvic pain in primary care. Evidence from a national general practice database. Br J Obstet Gynaecol 1999; **106**:1149-1155.
5. Jamieson DJ, Steege JF: The prevalence of dysmenorrhea, dyspareunia, pelvic pain, and irritable bowel syndrome in primary care practices. Obstet Gynecol 1996; **87**:55-58.
6. Mathias SD, Kuppermann M, Liberman RF, Lipschutz RC, Steege JF: Chronic pelvic pain: Prevalence, health-related quality of life, and economic correlates. Obstet Gynecol 1996; **87**:321-327.
7. Howard FM: The role of laparoscopy in chronic pelvic pain: Promise and pitfalls. Obstet Gynecol Surv 1993; **48**:357-387.
8. Gambone JC, Mittman BS, Munro MG, Scialli AR, Winkel CA: Consensus statement for the management of chronic pelvic pain and endometriosis: Proceedings of an expert-panel consensus process. Fertil Steril 2002; **78**:961-972.
9. Demco LA: Effect on negative laparoscopy rate in chronic pelvic pain patients using patient-assisted laparoscopy. JSLS 1997; **1**:319-321.
10. Howard FM, El-Minawi AM, Sanchez RA: Conscious pain mapping by laparoscopic in women with chronic pelvic pain. Obstet Gynecol 2000; **96**:934-939.
11. Chung MK, Chung RP, Gordon D: Interstitial cystitis and endometriosis in patients with chronic pelvic pain: The "Evil Twins" syndrome. JSLS 2005; **9**:25-29.
12. Rosamilia A: Painful bladder syndrome/interstitial cystitis. Best Pract Res Clin Obstet Gynaecol 2005; **19**:843-859.
13. Teichman JM, Parsons CL: Contemporary clinical presentation of interstitial cystitis. Urology 2007; **69(Suppl 4)**:41-47.
14. Curhan GC, Speizer FE, Hunter DJ, Curhan SG, Stampfer MJ: Epidemiology of interstitial cystitis: A population-based study. J Urol 1999; **161**:549 -552.

15. Oravisto KJ: Epidemiology of interstitial cystitis. Ann Chir Gynaecol Fenn 1975; **64**:75-77.
16. Held PJ, Hanno PM, Wein AJ: Epidemiology of interstitial cystitis: 2. In: Hanno PM, Staskin DR, eds. Interstitial cystitis. London: Springer-Verlag, 1990, pp 29-48.
17. Jones CA, Nyberg L: Epidemiology of interstitial cystitis. Urology 1997; **49(Suppl 5A)**:2-9.
18. Ito T, Miki M, Yamada T: Interstitial cystitis in Japan. BJU Int 2000; **86**:634-637.
19. Parsons JK, Kurth K, Sant GR: Epidemiologic issues in interstitial cystitis. Urology 2007: **69(Suppl 4A)**:5-8.
20. Reiter RC, Gambone JC: Non-gynecologic somatic pathology in women with chronic pelvic pain and negative laparoscopy. J Reprod Med 1991; **36**:253-259.
21. Howard FM: Interstitial cystitis, In: Howard FM, Perry CP, eds. Pelvic pain: Diagnosis and management. New York, NY: Lippincott, Williams and Wilkins, 2000, pp 260-270.
22. Parsons CL, Bullen M, Kahn BS, Stanford ET, Willems JJ: Gynecologic presentation of interstitial cystitis as detected by intravesical potassium sensitivity. Obstet Gynecol 2001: **98**:127-132.
23. Parsons CL, Dell J, Standford EJ, Bullen M, Kahn BS, Willems JJ: The prevalence of interstitial cystitis in gynecologic patients with pelvic pain, as detected by intravesical potassium sensitivity. Am J Obstet Gynecol 2002; **187**:1395-1400.
24. Hanno PM: Re-imagining interstitial cystitis. Urol Clin North Am 2008; **35**:91-99.
25. Leppilahti M, Tammela TLJ, Huhtala H Auvinen A: Prevalence of symptoms related to interstitial cystitis in women: A population-based study in Finland. J Urol 2002; **168**:139-143.
26. Clemons JL, Arya LA, Myers DL: Diagnosing interstitial cystitis in women with chronic pelvic pain. Obstet Gynecol 2002; **100**:337-341.
27. Chung MK, Chung RR, Gordon D, Jennings C: The evil twins of chronic pelvic pain syndrome: Endometriosis and interstitial cystitis. JSLS 2002; **6**:311-314.
28. Forrest JB, Dell JR: Successful management of interstitial cystitis in clinical practice. Urology 2007; **69(Suppl 4)**:82-86.