Interstitial cystitis/painful bladder syndrome for the primary care physician

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Interstitial cystitis also known as painful bladder disorder refers to individuals with chronic bladder inflammation of unknown cause. The presentation of disabling symptoms of urgency, frequency, nocturia, and varying degrees of suprapubic discomfort, is one that the primary care physician will encounter frequently as the prevalence of interstitial cystitis ranges from 10.6 cases per 100,000 to as high as one in 4.5 women, depending upon the criteria used for its diagnosis. Many etiologies are possible. The disorder can be divided clinically into two groups—ulcerative and non-ulcerative—based on cystoscopic findings and response to treatment. In general the diagnosis is made by excluding known treatable causes of bladder irritation. Criteria for the disease are lacking. Management follows an approach of applying the least invasive therapy that affords sufficient relief of symptoms. This monograph attempts to guide the practicing primary care physician from the clinical presentation to a sensible diagnostic work-up and reviews the present management strategies in patients with interstitial cystitis.

Key Words: interstitial cystitis, bladder

Introduction

More than a century has passed since Max Nitze, the German inventor of the modern cystoscope, first described a discreet circumscribed inflammatory lesion of the bladder, identifiable endoscopically, that caused patients to have "heftige Beschwerden".[1] As the microscopic appearance was of inflammatory cells extending into the submucosa Nitze termed the disorder "cystitis parenchymatosa," and described it as a chronic bladder inflammation of unknown cause and no effective treatment. This presentation of disabling symptoms of urgency, frequency, nocturia, and varying degrees of suprapubic discomfort, is one that the primary care physician will encounter frequently.[2] Since the days of Nitze, the presentation has inspired the invention of many evocative identifiers including, painful bladder disease, sensory bladder disease, chronic abacterial cystitis and perhaps the most commonly used current term, interstitial cystitis/bladder pain syndrome (IC/BPS).[3] The many names coined for this disease do not reflect an understanding of its cause which remains as speculative as it was a century ago. The disorder continues to plague sufferers and puzzle researchers. This article reviews this disorder in detail with an emphasis on its recognition by the primary care physician. Correlating the clinical presentation to a sensible diagnostic work-up and pathologic evaluation in patients with interstitial cystitis will hopefully lead to a better future for interstitial cystitis sufferers today than in the time of Nitze.

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Demographics

The prevalence of interstitial cystitis ranges from 10.6 cases per 100,000 to as high as one in 4.5 women, depending upon the criteria used for its diagnosis.[4-7] The disease is more common in women than men, with a female to male ratio of approximately 10:1.[8] Subtyping is suggested by differences in endoscopic and clinical presentation and is important because it reflects fundamental differences in etiology which influences response to treatment.[9] Histologically there are fundamental differences between the two subtypes, ulcer interstitial cystitis presenting a severe abnormality of the urothelium and characteristic inflammatory cell infiltrates while inflammation is scant in nonulcer IC. Regulation of urinary nitric oxide synthase activity has been proposed to be of importance for immunological responses in IC and recent evidence suggests profound differences between the two subtypes concerning nitric oxide production, mirroring the differences in inflammatory response.[10]

Ulcerative

GA Hunner, professor of obstetrics and gynecology at the Johns Hopkins Hospital, deserves the credit for establishing the clinical entity of the ulcerative subtype of interstitial cystitis. "Hunner's ulcer" which was described as a localized submucosal fibrosis was seen through the cystoscope as a discreet area of reddened mucosa with central scar that ruptures and bleeds with increasing bladder distension.[11] We see this uncommon lesion in 5% of out referral population of IC patients. The ulcer is visible at low volumes of bladder fill. Histologically, the ulcer is associated with marked infiltration with chronic inflammatory cells including mast cells.[12] Because it seems to come and go, it has also been called an "elusive ulcer." The patients with ulcers tend to be older and have significantly smaller bladder volumes than patients without ulcers. Most importantly for the clinician, their response to various treatments may be different (for example oral pentosanpolysulfate has less of an effect on ulcerative variety whereas surgical intervention which removes diseased bladder is more successful in this subtype).[9,13] Patients with ulcerative subtype IC have been found to have high levels of NO in the bladder. The highest levels of NO were found in patients in the initial phase of ulcerative IC. The significance of NO levels has been debated and remains an area of investigation.

Non-ulcerative

Patients with non-ulcerative disease do not reveal lesions in the bladder at low volumes on cystoscopy. Patients are typically younger at diagnosis and symptom onset.[14] Under general anesthesia, this group typically has larger bladder capacity. Subjects with non-ulcerative variety have not been found to have significantly increased NO levels in the bladder.

Overview

It is important to emphasize that primary care physicians will most likely be seeing IC early in the natural history of the disease. The disease is diagnosed by symptoms, and the primary care physician will probably be the first medical professional to encounter them. Characteristic symptoms of pain and urinary frequency and urgency should not be forgotten by the primary care physician in the context of IC. Perhaps the most common error made relating to IC is one of omission during the process of methodically excluding other urinary tract diseases. See Table 1. Many patients with IC will prove to have simple UTIs after careful evaluation. A graver pitfall is assigning a diagnosis of IC when, in fact, a urinary tract malignancy is causing symptoms that mask the real problem and suggest IC. Table 2 is included for guidelines for seeking the referral by a urologist. It is reasonable that the primary care physician establishes the diagnosis of IC using the initial tests described in this report. Most of the time, the initial treatment will be initiated by the primary care physician as well.

TABLE 1. **IC/PBS - general observations**

Ulcer variant (Hunner's ulcer) uncommon
Non-ulcer variant much more common
Not confined to women
Can occur in men and children
Prevalence increasing
Greater awareness
Knowledge of overlap with other conditions
Overlapping conditions
Chronic cystitis (UTIs)
Overactive bladder syndrome (OAB)
Gynecologic chronic pelvic pain
Chronic pelvic pain syndrome in men (prostatitis, prostatodynia)
Gastrointestinal disease (irritable bowel syndrome etc)

TABLE 2. **Clinical suspicion of IC/PBS in primary care practice**

Women with symptoms of:
Cystitis with negative urine cultures/non-response to oral antibiotics
Overactive bladder syndrome (frequency, urgency, nocturia etc.) unresponsive to oral anti-cholinergic (anti-muscarinic)
Chronic pelvic pain after gynecologic causes have been identified/treated
Men with symptoms of:
Chronic pelvic pain (scrotal, bladder) and irritative voiding symptoms
Prostitutes/prostatodynia unresponsive to antibiotics, alpha-blockers etc.

Symptom complex

The hallmark of interstitial cystitis is the presentation of irritative voiding symptoms in the presence of cytologically negative urine. Irritative voiding symptoms consist of urinary frequency, urgency, and nocturia and bladder pain. When considering norms in bladder function, it is important to remember that there is great variation in what represents an individual's normal state. The clinician should delineate the patient's normal state of bladder function, and the degree to which symptoms deviate from this state. This is often more important than comparing the patient's symptoms to definitions that apply strictly to a general population. In general terms, urinary frequency occurs when patients need to void more than seven times in 24 hours. Nocturia is present when patients need to get out of bed during the night more that one time. Urgency refers to a strong desire to void, accompanied by the fear that incontinence will occur. Pain associated with interstitial cystitis is often localized to the suprapubic area. In patients with ulcerative interstitial cystitis, pain is often the most bothersome symptom and can be localized to the site of the ulceration. Irritative voiding symptoms can be associated with impairment of normal sexual function and a sexual history should be elicited. Gastrointestinal symptoms are quite common with the disorder and interstitial cystitis often coexists with irritable bowel syndrome.[15]

Etiologic theories

Although numerous theories of pathogenesis have been proposed, an etiology of this disorder that goes beyond our appreciation of its symptoms remains conjectural. Diverse causes of interstitial cystitis have been proposed that include autoimmune, infectious, neurologic, psychologic and epithelial factors.[16-19] The disparity in these areas of study suggests that we haven't really begun to understand the pathophysiology at play in interstitial cystitis. Much has been discussed about a purported causative defect in the glycosaminoglycan component of the bladder epithelium. Glycosaminoglycan (GAG) is a general structural term describing molecules in the form of long unbranched polysaccharide chains composed of repeated disaccharide units. Actually, there is an almost limitless variation in the structure of these molecules, and they are a ubiquitous component of the extracellular matrix. These features imply that the function of glycosaminoglycans is complex, important and diverse, and the function of these complex molecules in the extracellular matrix has been an area of intense study by matrix biologists.

What is known about glycosaminoglycans has been translated into a popular theory to explain interstitial cystitis. This theory poses that the problem of interstitial cystitis results from a defective bladder epithelium, namely in the bladder's lining of glycosaminoglycans (GAGs). GAGs contain a high density of negative charges, allowing them to attract and retain water. In the extracellular space (such as on the luminal surface of uroepithelial cells) low concentrations of GAGs can form hydrated gels rich in water. It is tempting to visualize GAGs as forming a hydrated protective gel that prevents noxious invading substances from attacking the bladder interstitium. A "leak" in the GAG layer, presumably due to bladder injury, could somehow expose sensory nerves in the interstitium to irritants and triggers a noxious sensation.[18] This theory set the stage for popularizing medications that are said to restore the defective bladder lining. Whether the attempt to pin interstitial cystitis to a defective or absent biomolecule or whether the end result of chronic inflammation seen in interstitial cystitis represents more complex cause or causes remains to be seen.

Current work-up

Clinical suspicion for interstitial cystitis should be high when patients manifest chronic (i.e., for more than 6 weeks) disturbing lower urinary tract symptoms such as urinary frequency, urgency, discomfort, pain (suprapubic, pelvic, and perineal), and dyspareunia in the presence of sterile urine. History physical exam and cystoscopy are important in the evaluation; however the diagnosis of this disorder remains one of exclusion.[20,21] Fasting blood sugar and urinalysis will be useful in this differential. As many disorders can be associated with irritative bladder complaints, the clinician should rule out a checklist of pathologies before making a diagnosis of interstitial cystitis, Table 3. The greatest overlap of symptoms occurs with urinary tract infection and many patients may routinely be treated with empiric antibiotics without a urine culture thereby postponing a definitive diagnosis. A high index of suspicion for interstitial cystitis should therefore be held for patients without rapid response to empiric antibiotics. In such cases urine culture should be obtained. Antibiotics should be discontinued at the time of specimen collection. Unusual infections are also possible. TB, manifesting as tuberculous cystitis, is an example of an uncommon, but well-characterized infection that causes symptoms of bladder irritation and should be considered in some patients.

Questionnaires for the evaluation of voiding symptoms are myriad and widely used. Intended as an aid for distinguishing interstitial cystitis from other diagnoses and quantifying response to therapy, these questionnaires cannot be used to define the disorder. Although the specificity of these instruments in the primary care physicians' office has not been tested, in the urology patient population, two instruments, the O'leary-Sant Symptom Index and Problem Index and the Pain, Urgency, Frequency Symptom Scale are validated for discrimination of interstitial cystitis. As such these instruments appear to be useful as a first screen to evaluate potential patients with interstitial cystitis for further diagnostic procedures.[22-24]

TABLE 3. **Diagnosis of IC/PBS**

Clinical diagnosis by exclusion
History and physical
Urinalysis to exclude UTI, hematuria
Urine culture and cytology (if hematuria present)
Exclusion specific bladder disease
Use of symptom questionnaires
Potassium sensitivity bladder testing
Cystoscopy with hydodistension and possible bladder biopsy
To distinguish ulcer vs. non-ulcer disease
Rule out carcinoma in situ etc
Hydro-distension under anesthesia therapeutic (small % patients, short-lived response)

Cystoscopy and biopsy of the bladder should be performed even if no lesion is seen.[25] Bear in mind that the primary purpose of doing this is to rule out the possibility of malignancy, not to identify interstitial cystitis. The cystoscopic identification of the Hunner's ulcer will guide ultimate treatment and should include biopsy of the abnormal tissue. There is no pathognomonic histologic finding that is diagnostic for interstitial cystitis. The pathologic features seen with interstitial cystitis consist of a nonspecific chronic inflammatory cell infiltrate, edema, and vasodilation of the submucosa and detrusor layers of the bladder wall.[26] A number of studies have suggested that mast cell infiltration of the bladder wall is associated with interstitial cystitis.[3,27,28] Observation of a strong relationship among detrusor mast cell density, especially degranulated mast cells and degree of epithelial loss, submucosal inflammation, epithelial ulceration, urinary pyuria and response to treatment has been noted.[29] Mastocytosis in interstitial cystitis is best documented by tryptase immunocytochemical staining. Standard surgical stains such as Giemsa and toluidine blue routinely underestimate the degree of mastocytosis. Detrusor mastocytosis occurs in both classic and nonulcer IC. Mucosal mast cell increase is present in nonulcerative IC. Mast cells have been reported to be 6- to 8- fold higher in the detrusor compared with controls in ulcer type interstitial cystitis and 2- to 3-fold higher in the nonulcerative variety. Mast cell activation without typical exocytosis occurs in the mucosa and submucosa. Activation of mast cells, irrespective of bladder location or degree of mastocytosis, is significant. Mast cell-derived vasoactive and proinflammatory molecules may contribute to the pathogenesis of at least some forms of the disease.[30]

Hydrodistention of the bladder under general or spinal anesthesia has been one of the most commonly performed diagnostic tests for interstitial cystitis. First reported by Bumpus in 1930, the procedure has been used for both diagnostic and therapeutic purposes.[31] Anesthesia allows distention of the bladder to a volume greater than the patient's awake capacity because of the severe discomfort which naturally would be expected by this nonphysiologic and traumatic

procedure. With distension, diffuse hemorrhagic spots called "glomerulations" are typically seen.[32] It is important to remember that "glomerulations" are not pathognomonic for interstitial cystitis. It is possible that such traumatic lesions are seen when a normal bladder is distended beyond its normal capacity. Aside from anesthetic risks, the test is not without morbidity as bladder perforation and vesical necrosis have been reported.[33] Although commonly performed, the hydrodistention procedure appears to offer little therapeutic benefit and finding glomerulations offers little specificity.[32,33]

In an effort to discriminate normal individuals from those with symptoms originating in the bladder due to abnormal epithelial permeability, Parsons devised a test called the potassium sensitivity assay.[34] The test is based on the simple hypothesis that a normal individual would be unable to identify a solution of potassium versus water or at least would experience no symptoms with a solution of intravesically placed potassium. Various authors have reported that roughly 70% of patients with interstitial cystitis will be potassium sensitive.[35,36] The test involves bladder instillation of sterile water followed by a 400 mEq/l potassium solution, with subjective grading by the patient as to which solution provoked pain and/or urgency. Although simple to perform in the office, the test remains controversial as to its usefulness.[37-39] Unlike most other diseases, IC lacks a "gold standard" diagnostic test. Without such a reference, there can be no meaningful estimation of the sensitivity and specificity. Continuing this line of thought leads to the dilemma with PST in determining its value in determining treatment decisions. For example, a patient with symptoms of IC in whom other possible diagnoses have been ruled out is probably best treated for IC regardless of the result of the PST. Furthermore, it would make little sense to treat a patient without symptoms of IC solely because of the result of the PST .

Diagnostic criteria

With increased recognition of patients with chronic irritative voiding symptoms in the 1980's, the overall lack of precise diagnostic criteria for interstitial cystitis made research difficult. In 1988, members of a panel organized by the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) met and developed a set of criteria for accrual of patients in NIH-sponsored studies on interstitial cystitis.[25] The original intention was only to specify and standardize criteria for entrance into research protocols, and as such the NIDDK criteria have been shown to be restrictive for clinicians as the diagnostic definition of interstitial cystitis.[40,41] It is helpful to always keep in mind that at present, interstitial cystitis represents a symptom complex and there are no pathognomonic findings associated with the disease.[42]

Management

As is typical of a disorder with no known cause, treatments are myriad and come and go with great frequency. The following is not meant to be an all-inconclusive list of treatments for interstitial cystitis but rather a brief review of those most commonly utilized today, Table 4 Certainly, as with any disease that tends to be of chronic nature and requires continuous or at least intermittent treatment, one main tenet is to apply the least invasive therapy that affords sufficient relief of symptoms.

TABLE 4. **Treatment of IC/PBS**

Oral pharmacological agents
Sodium pentosanpolysulfate
Amytriptyline
Hydrolyzine
Anti-cholinergic
Non-steroidal anti-inflammatory
Intravesical drug therapies
Dimethyl sulfoxide
Heparin
Steroids
Lidocaine
Bicarbonate
Combinations of above
Surgery - rarely indicated
Focal ulcer therapy (Hunner's ulcer)
Denervation
Urinary diversion
Cystectomy
Peripheral nerve stimulation (pudenda, sacral)
Pain management - may need pain specialist
Non-narcotic medications
Narcotic medications
Psychotherapy
Pelvic floor rehabilitation
Physiotherapy
Internal pelvic floor massage
Supportive care
Support groups
Meditation and relaxation

Supportive therapy

Avoidance of urinary tract infection

Although there appears to be a low incidence of recurrent UTI's in patients with interstitial cystitis followed longitudinally, bacterial infections do occur and can be the source of a symptom flare.[43] Urine culture and sensitivity with treatment appropriate to the organism is therefore an important management guideline in the care of interstitial cystitis patients.

Support groups

Patients with interstitial cystitis use support group meetings for social support and to learn coping skills.[44] This form of therapy is extremely helpful in a chronic disease with no known cure. Physician encouragement is an important factor in attendance of these groups. Groups such as the Interstitial Cystitis Association (ICA) are dedicated to disseminating knowledge of the disorder to the lay public as well as supporting the self-help of the sufferers. Other associations and web based groups are also available.

Oral agents

Amitriptyline (titrated up to bedtime doses of 50 mg-100 mg)

The use of amitriptyline for interstitial cystitis was first proposed by Hanno and Wein for treatment of refractory interstitial cystitis due to its known efficacy in many chronic pain disorders.[45] The agent facilitates urine storage by decreasing excitability of smooth muscle in the area. This class of drugs (tricyclic antidepressants) has anticholinergic and antihistaminic activity, the ability to block re-uptake of released amine neurotransmitters serotonin and noradrenaline as well as the theoretical stimulation of beta adrenergic receptors in the bladder body. The drug is analgesic even in the absence of depression.[46] A central mechanism of analgesia is implied in the drug's ability to blunt the pain of pelvic organ distension.[47]

Hydroxyzine (50 mg-75 mg per day)

Hydroxyzine is an H-1 histamine receptor antagonist and as such has garnered much interest as a treatment for interstitial cystitis with its known association to mast cells. Hydroxyzine has been shown to reduce carbachol-induced serotonin release from rat bladder in vitro through a mechanism which was unrelated to its H-1 receptor antagonistic properties.[48] The ability of hydroxyzine to inhibit bladder mast cell activation by neurogenic stimuli along with its anticholinergic, anxiolytic and analgesic properties, may explain the clinical efficacy of this drug in reducing IC symptoms. A recent multi-center clinical trial of hydroxyzine resulted in a 31% response rate for interstitial cystitis participants.[49]

Pentosan polysulfate sodium (100 mg PO three times per day)

Based on studies done in animals showing that replacement of the natural surface layer of the bladder with intravesically or orally administered synthetic polyanions could significantly reduce the incidence of infection, Parsons promoted the use of synthetic polyanions in relieving ongoing irritation of the bladder.[50] Oral administration of pentosan polysulfate sodium (PPS) (Elmiron) which is thought to "resurface" the bladder lining during its urinary elimination has become a commonly used Food and Drug Administration (FDA) approved treatment for interstitial cystitis.[51] PPS is related to heparin and has anticoagulant activity. Response rates vary by study ranging from 34% to 80% benefit with the treatment.[13,49,51] Initiation of PPS treatment within 6 months of establishing the diagnosis of IC may be associated with greater improvement in patient symptoms and symptom bother.[52] The medication has the advantage of being well tolerated with low incidence of headache and diarrhea.[53] PPS can prolong prothrombin time and partial thromboplastin time--some have advocated patients on this drug have coagulation monitoring.[54]

Bladder instillations

Dimethyl sulfoxide

Dimethyl sulfoxide (DMSO) was approved by the FDA for the treatment of interstitial cystitis in 1977 and has been a commonly used therapeutic intervention.[55] Having anti inflammatory, analgesic and anti-collagen deposition effects, the medication diffuses through the tissues it is applied to and relieves symptoms in roughly 40% of patients.[56] DMSO is given as a 50% solution bladder instillation and is usually given on a weekly or biweekly basis for a 6 week trial. If effective, further doses are usually needed and some patients can be taught to instill the agent themselves at home.

Combination solutions

Although many combination agents have been proposed, a solution of lidocaine, sodium bicarbonate and heparin is currently one of the most popular. Described by Parsons in 2005, the solution consists of 40,000 U heparin, 8 ml of 1%-2% lidocaine and 3 ml 8.4% sodium bicarbonate administered intravesically.[57]

In 2008 Welk et al evaluated 23 consecutive patients with interstitial cystitis using this combination as an intravesical agent.[58] Although the study was not placebo controlled, they found this solution given three times weekly for 3 weeks provided relief of voiding symptoms, pain, and dyspareunia in a large percentage of patients based on validated symptom questionnaires.

Surgical intervention

Focal therapy of the ulcer

This approach applies only to patients in whom a localized discreet ulcer is evident. The goal is to decrease pain by either removing or modulating the diseased tissue. Transurethral resection of the Hunner's ulcer first described by Kerr in 1971 has been reported to relieve pain in 73% of patients. The majority of successfully resected patients will require repeat resection at a later date.[59] Use of an Nd: YAG laser to resect the Hunner's ulcer has been reported to be 85% effective in eliminating pain. Recurrences with this modality are frequent and a 5% rate of bowel perforation is noted.[60] Steroid injections for treatment of Hunner's ulcerations have been reported to be effective.[61]

Although a list of surgical procedures that have been proposed over the years would be substantial, it is generally believed that surgery is a treatment of last resort for interstitial cystitis and therefore should be definitive. The goals of bladder sparing surgery have been either to denervate the bladder and therefore decrease its sensation or to excise the inflamed bladder tissue with or without substitution using bowel. Patients with ulcerative variety interstitial cystitis typically gain little response from a non-operative approach and seem to get better responses when operative treatment is used compared to the non-ulcer patients.[9]

Denervation procedures

In an effort to relieve symptoms surgically yet minimize perioperative complications and functional morbidity, denervation procedures have been described for interstitial cystitis and chronic pelvic pain syndrome. Turner-Warwick described supra-trigonal cysto-cystoplasty in 1947 in which the distensible portion of the bladder above the trigone was separated and then reattached as a means of separating the neurologic connections between the segments.[62] This operation was later replaced by the cystolysis procedure which achieved denervation by blunt dissection and transsection of various neurovascular bundles to the bladder. Significant complications have been reported with both of these procedures including postoperative urinary retention and bladder necrosis; however, lack of long term improvement seems to be the main reason for limited interest in this form of therapy.[63,64]

Partial cystectomy

Excision of Hunner's ulcerations was reported by Guy Hunner in his original manuscript as the treatment of choice when a discreet ulcerative lesion could be found. Performed through a suprapubic extraperitoneal incision the procedure was deemed to be effective in this group of five patients, although little follow-up was reported.[11] In the modern era, partial cystectomy is usually performed in conjunction with augmentation of the bladder capacity using a detubularized segment of intestine. Bowel augmentation can incur significant morbidity including both perioperative problems and postoperative difficulties with urinary retention and recurrent inflammation in the bowel segments used.[65,66] A recent review of patients undergoing reconstructive surgery for interstitial cystitis revealed complete long-term relief of symptoms was only likely in patients with the ulcer type of the disease.[9]

Urinary diversion

When all bladder sparing treatment has either failed or is not indicated, urinary diversion through creation of a bowel conduit that provides continuous urinary drainage through an ostomy can be expected to provide immediate and permanent cure.[15] Whether to simultaneously remove the bladder remains controversial.

Conclusion

The development of urinary urgency, frequency and bladder pain—the hallmarks of interstitial cystitis—impacts the sufferer with what Nitze described as "violent bodily complaints" which are at once emotional, sexual, psychosomatic and behavioral.[1] The problem is usually first encountered by the primary care physician with the urologist or urogynecologist becoming involved when simple measures are unsuccessful. Unfortunately, little has changed in our understanding of the disorder and its optimal management.

There is reason to hope. The disease is now understood to be a clinical syndrome with potentially multiple underlying etiologies masquerading as the same symptoms. Subtyping of the disease is showing some correlation with specific treatment outcomes perhaps allowing a more tailored approach. Newer

medications are being looked at including neurotoxins, (botulinum toxin, resiniferatoxin) and anti-rejection medication (cyclosporin A) with some success.[46,47,67,68] Ever increasing research efforts are being focused on interstitial cystitis: how it occurs, how to evaluate it, and how best to correct it. Only through a clear explanation of the problem as well as appropriate recommendations for treatment will this devastating disorder be relieved.

Take-home messages

Principles of care of patient with IC/PBS

- Multi-disciplinary care
  - Primary care physician
  - Specialists
    - Urologists/urogynecologists
    - Gastroenterologist
    - Pain specialist
    - Gynecologist
- Holistic approach
  - Specific pharmacologic therapies
  - Alternative/complimentary therapy
  - Supportive care
- Multi-modality approach essential
  - Multi-disciplinary specialists/PCP
  - Multi-modality combinations of drugs

Disclosure

None declared. □

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DISCUSSION

Question (Dr. LaRoche):
How long does it take to see a treatment response to oral medication?

Answer (Dr. Klutke):
Response in interstitial cystitis to therapy is extremely variable. This holds true for any of the many therapies that are currently in use. Furthermore, in the majority of patients, none of the available treatment modalities are likely to totally and permanently cure the disorder. For these reasons, the principle of using the least invasive therapy that affords improvement continues to be sound. We tend to move slowly between successive options and generally wait months before deciding whether or not an individual treatment approach is effective.