

CME

The Role of Pelvic Floor Physical Therapy in the Treatment of Pelvic and Genital Pain-Related Sexual Dysfunction

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ABSTRACT

Introduction. Chronic pelvic pain (CPP) in women and men is associated with significant sexual dysfunction. Recently, musculoskeletal factors have been recognized as significant contributors to the mechanism of pelvic pain and associated sexual dysfunction, and in particular, pelvic floor muscle hypertonus has been implicated.

Aim. The purpose of this Continuing Medical Education article is to describe the musculoskeletal components involved in pelvic and genital pain syndromes and associated sexual dysfunction, introduce specific physical therapy assessment and intervention techniques, and provide suggestions for facilitating an effective working relationship among practitioners involved in treating these conditions.

Methods. A review of the relevant literature was performed, clarifying current definitions of pelvic pain, elucidating the role of musculoskeletal factors, and determining the efficacy of physical therapy interventions.

Results. A review of the role of physical therapy for the treatment of pelvic pain and related sexual dysfunction.

Conclusions. Physical therapy treatment of pelvic pain is an integral component of the multidisciplinary approach to CPP and associated sexual dysfunction. **Rosenbaum TY, and Owens A. The role of pelvic floor physical therapy in the treatment of pelvic and genital pain-related sexual dysfunction. J Sex Med 2008;5:513–523.**

Key Words. Pelvic Pain; Dyspareunia; Sexual Dysfunction; Pelvic Floor; Physical Therapy

Introduction

Pelvic pain in women [1] and in men [2] is associated with significant sexual dysfunction. While chronic pain impacts all aspects of functioning, including work, family relationships, and social activities, the most frequent complaint cited by patients with chronic pelvic pain (CPP) is sexual dysfunction [3]. Factors contributing to sexual dysfunction in patients with chronic pain are multifactorial and contextual [4], and may be related to comorbidity with depression [5,6], use of antidepressant medications [7], and relationship satisfaction [8], among many other factors. CPP may have a higher association with sexual dysfunction than other types of chronic pain. CPP has been correlated with increased rates of past sexual abuse [9], which may impact negatively on sexual function [10]. CPP specifically involves areas intimately

connected to sexuality, which may negatively impact one's body image and sexual self-esteem [11], and also affects both partners in the relationship [12]. Specific presentations, such as infertility associated with endometriosis [13,14] and lower urinary tract symptoms including urinary frequency and urgency common in interstitial cystitis (IC), affect sexual function as well [13–15]. Gastroenterological conditions, such as celiac disease [16] and irritable bowel syndrome (IBS) [17], affect sexual comfort. Finally, physiological correlates may exist, most notably related to pelvic floor dysfunction, which impact both pain and sexual function [18]. This article will describe some of the musculoskeletal contributors to pelvic and genital pain syndromes and associated sexual dysfunction, introduce specific physical therapy assessment and intervention techniques, and provide suggestions for facilitating a working relationship among

physical therapists, sex therapists, and physicians treating these conditions.

Defining CPP

Whereas acute pelvic pain is a symptom of underlying tissue injury or disease, CPP, the duration of which may be 3 months to several years is the disease itself. CPP is a term, which includes but poorly defines specific syndromes such as endometriosis, IC, vulvodynia, vulvar vestibulitis syndrome (VVS), and prostatitis/prostodynia. Prevalence rates vary widely because of a lack of clearly defined parameters regarding what conditions constitute CPP. There is a lack of consensus regarding whether female genital pain, such as in VVS, should be considered a vulvar rather than pelvic pain condition [19], although male genital pain generally falls under the category of pelvic pain. There is also a lack of consensus regarding which specific criteria in regard to duration of pain, location, intensity, and etiology define CPP [20], and attempts to classify the types of CPP tend to group syndromes according to which systems are affected (see Table 1).

In clinical practice, it is not unusual for patients with CPP to visit different specialists and receive different diagnoses such as IC, vulvodynia, IBS, and sexual pain disorder by a urologist, gynecologist, gastroenterologist, and sexologist, respectively. Separate organizational bodies attempt to classify pelvic pain according to descriptive symptoms reflective of specific specialties. Pelvic pain classification has been proposed by the National Institutes of Health for prostatitis and nonprostate-related pelvic pain [23], the International Society for the Study of Vulvovaginal Disease for vulvar pain syndromes [24], and the International Continence Society, which focuses on urinary dysfunction [25]. Despite classifications that appear to reflect specific disciplines, and thus, specific organ involvement, current understanding of CPP points to multiple etiologies, and as such, research has begun to focus on discovering the causes, which affect multiple systems, such as organ cross talk [26]. Pudendal neuropathy, hernias, and pelvic congestion have been considered as causal factors, and recently, musculoskeletal dysfunction has been suggested as playing a significant role in CPP [27,28]. Whether or not organic or systemic pathology is identified, musculoskeletal causes should be considered as the

mechanism linking these disciplines with specific attention paid to pelvic floor function [29,30].

Pelvic Pain, Sexual Dysfunction, and Sexual Pain

Sexual dysfunction characterizes pelvic pain. Male pelvic pain is associated with premature ejaculation [31] and erectile dysfunction [2,32]. Decreased libido and arousal are associated with pelvic pain in men [2] and women [33]. However, pain during sexual activity appears to be the sexual dysfunction most highly associated with pelvic pain [34]. Although the term “sexual pain” implies a uniquely sexual quality to the experience of pain, sexual pain disorders are primarily pain disorders that interfere with sexual activity [35]. Sexual pain disorders are usually considered female disorders [36,37] and are classically divided into vaginismus and dyspareunia. Dyspareunia can be further divided into superficial and deep pain, with the former associated with diagnoses such as VVS, and the latter associated with pelvic pathology such as endometriosis [38]. Both types of dyspareunia are multifactorial and are influenced by visceral, hormonal, inflammatory, neuropathic, and musculoskeletal and psychosexual components [39]. However, the current definitions fail to include the experience of pain with genital arousal, pain with orgasm and/or ejaculation, male genital pain with touch, erection, penetration or ejaculation, and anodyspareunia, which refers to anal pain with receptive intercourse whose incidence is 13% among gay men [40].

Pelvic Floor Muscle Anatomy and Function

The pelvic floor muscles attach from the pubic bone anteriorly, to the coccyx posteriorly, and form a bowl-like structure, along with ligaments and fascial tissue. The muscles of the pelvic floor consist of superficial muscles including the bulbospongiosus, ischiocavernosus, superficial transverse perineal and external ani sphincter muscles, an intermediate layer consisting of the deep transverse perineal, and the deeper muscles known collectively as the “levator ani” muscles, which consist of the pubococcygeus and iliococcygeus. The levator ani act to lift up the pelvic organs and are active during defecation. The puborectalis muscles act together with the external anal and urethral sphincters to close the urinary and anal openings, contract the sphincters, and prevent urinary or fecal leakage.

Table 1 Classification of chronic pelvic pain syndromes

Chronic pelvic pain (new definition)	Pelvic pain syndrome (1)	Urological	Bladder pain syndrome (1) Urethral pain syndrome (1) Penile pain syndrome (new definition) Prostate pain syndrome (Adapted from the National Institutes of Health) (3) Scrotal pain syndrome (1)	Interstitial cystitis
		Gynecological	Endometriosis-associated pain syndrome (new definition) Vulvodynia (ISSVD 2003) Generalized (ISSVD 2003)	Post-vasectomy pain syndrome (new definition) Epididymal pain syndrome (new definition) Provoked (sexual nonsexual/both) Unprovoked Mixed (provoked and unprovoked)
		Anorectal	Proctalgia fugax (2) Anorectal pain syndrome (new definition) Anismus	Localized (ISSVD 2003) [21] vestibulodynia clitorodynia hemivulvodynia
		Neurological Muscular	Pudendal pain syndrome (new definition) Perineal pain syndrome (1) Pelvic floor muscle pain syndrome (new definition)	Unprovoked Mixed (provoked and unprovoked)
	Well-defined conditions that produce pain, examples include:	Urological	Infective cystitis Infective prostatitis Infective urethritis Infective epididymo-orchitis	
		Gynecological Anorectal	Endometriosis Proctitis Hemorrhoids Anal fissure Pudendal neuropathy Sacral spinal cord pathology Vascular Cutaneous Psychiatric	
		Neurological		
		Other		

Modified and reprinted with permission: Fall M, Baranowski AP, Fowler CJ, et al. EAU guidelines on chronic pelvic pain. Eur Urol 2004;46:681–689 [22].

In addition to its supportive and sphincteric functions, the pelvic floor is involved in enhancing sexual pleasure for both partners [41]. In men, pelvic floor muscle function is involved in the enhancement of blood flow to the penis. While the ischiocavernosus muscle facilitates erection, the bulbospongiosus may be involved in maintaining the erection. Contraction of the bulbospongiosus muscles blocks blood from escaping by pressing on the deep dorsal vein of the penis [42]. In women, the ischiocavernosus muscle attaches to the clitoral hood enhancing sexual function as well [43]. Vaginal closure is assisted by the bulbospongiosus and puborectalis muscles in the female, as well as activation of the levator ani, consisting of the pubococcygeus and iliococcygeus muscles, which facilitate vaginal ballooning. In the male, contraction of these muscles assists in ejaculation and is perceived as pleasurable [41].

Pelvic floor muscle dysfunction generally refers to disorders of laxity (hypotonus), or overactivity (hypertonus). Hypotonus disorders, due to hormonal factors, mechanical damage, or weakness, are generally associated with urinary and fecal incontinence, as well as pelvic organ prolapse [44], but have also been implicated in contributing to pelvic pain and dyspareunia [45]. Current conceptualizations of pelvic floor involvement in sexual dysfunction, specifically sexual pain disorders, generally implicate pelvic floor hypertonus as the underlying pathology. Pelvic floor muscle abnormalities, most notably hypertonus, have been demonstrated to contribute to dyspareunia connected to IC [46], urethral syndrome [47], male CPP [48], VVS [49], and generalized vulvodynia [50].

Various terminologies have been used to describe hypertonus disorders of the pelvic floor including levator ani syndrome, pelvic floor tension myalgia [51], vaginismus, anismus, coccygodynia, sphincter dysenergia, pelvic floor spasm, and shortened pelvic floor [52]. The mechanism of how increased muscle tone is related to pain is not completely understood. Muscle contraction in response to pain has been referred to as guarding, splinting, cramping, and spasm, while persistent states of muscle overactivity have been described as spasticity, or hypertonus, more frequently associated with an increase in neurological tone rather than a pain response. Muscle *spasm* of the outer third of the vaginal muscles in response to attempted penetration is the Diagnostic and Statistical Manual of Mental Disorders, 4th edition,

definition of vaginismus, a sexual pain disorder associated with pelvic floor muscle dysfunction [36]. Whether the specific finding of spasm has been substantiated has been questioned [53], and current definitions of vaginismus refer to variable pelvic muscle contraction, and emphasize the experience of pain and anxiety rather than muscle spasm [37]. While the mechanism of pelvic floor dysfunction is not completely understood, studies have demonstrated pelvic floor muscle hyperactivity to be part of an overall response to heightened anxiety [54]. Pain may also trigger pelvic floor dysenergia. This phenomenon, characterized by paradoxical contraction of the puborectalis when attempting to release, is associated with constipation, incomplete bladder emptying, and penetration difficulties [55]. In CPP, where pain is often diffuse and unprovoked, it is theorized that when the pain is visceral or neuropathic, rather than somatic in nature, the muscular component is merely reactive. However, intrinsic musculoskeletal dysfunction could indeed be causal [27]. Current treatment models consider that musculoskeletal factors, including contracted, tight muscles, or muscle trigger points, may be involved in visceral and neuropathic presentations as well [56].

Postural and Movement Considerations

Pelvic floor function should not be considered in isolation, but as part of an integrated unit, which acts synergistically to provide trunk stability, enable painless mobility, support the viscera, and prevent bowel and bladder incontinence [57]. Postural and visceral stability is provided by bony and fascial components along with muscles of the pelvic floor, which work in coordination with the diaphragm as well as transverse abdominus and multifidus muscles. Decreased mobility, inflammation, or dysfunction of joints of the hips, sacro-iliac spine, or pubic symphysis, or shortening of surrounding muscles such as the iliopsoas, hamstrings, or hip adductors, may contribute to pelvic pain and may affect the visceral components, quality, and depth of breathing, or the ability to comfortably relax the levator ani to allow for painless sexual functioning [58].

Physical Therapy Intervention: Assessment and Treatment

The first author's physical therapy approach to treatment includes taking a detailed history, per-

forming a physical exam, and providing a treatment plan consistent with the goals of the patient. The latter generally includes the ability to attain optimal and pain-free sexual function. Treatment tools utilized by the physical therapist range from the educational, providing anatomical and physiological information; behavioral, rehabilitative, as in pelvic floor muscle strengthening and relaxation with tools such as pelvic floor biofeedback; and palliative treatment methods to decrease pain and improve tissue mobility. Therapeutic exercise programs should be individualized and specifically address tissue alterations that may have occurred with repeated movements and sustained postures [59]. Manual techniques, including massage, stretching, and soft tissue and bony mobilizations, are important components of treatment, as are electrical stimulation and sometimes ultrasound. Most of these techniques will be discussed further in more detail.

The physical therapy assessment begins by taking a patient history, observation of breathing, posture and gait, a musculoskeletal assessment, which includes trunk and pelvic palpation, external genital assessment, and intervaginal or inter-rectal pelvic floor evaluation. The history helps determine the patient's chief complaint, the nature and location of the pain, the existence of comorbid symptoms of urinary frequency, urgency, or constipation, and overall affect on sexual function. At this time, treatment goals are also determined and discussed.

General observation reveals the patient's posture, breathing, gait, body language, and movement patterns. CPP, as well as anxious body language, is associated with upper respiratory breathing patterns, decreased rib cage and abdominal motion, decreased pelvic joint mobility, and shortened muscles of the hips and pelvis. Ineffective excursion of the diaphragm creates increased muscle tone of the abdominal oblique muscles, which places increased intrabdominal pressure on the pelvic floor and creates dyssynergic breathing patterns and pelvic floor muscle dysfunction [60].

The musculoskeletal exam consists of assessing the bony, muscle, joint, and connective tissue structures, and evaluating the trunk, pelvic, and extremity mobility, length, and strength. Gross motor abnormalities, such as scoliosis, may be noted, which may contribute to postural or breathing abnormalities. Spinal, sacral, and pelvic

alignment are checked, and factors, such as sacroiliac and coccyx mobility, are noted. Hypermobility may be indicative of joint laxity, requiring core stabilization exercise. Muscles are tested for length, strength, and trigger points in both the viscoelastic and contractile components of the muscles. Externally, it is important to note the length and strength of the piriformis and iliopsoas muscles. Palpation is used to assess the muscle trigger points, areas of tightness, and decreased mobility, and to test the sensory perception. Temperature, color, tissue elasticity, and mobility are assessed as well as general sensitivity to light touch and pressure. Patients with CPP often present with multiple trigger points in the abdominal area, which in women are often located over the ovaries.

Pelvic Floor Examination

The genitalia, perineum, and anus are observed to note areas of redness, raised areas, scar tissue, or edema. In females, attention is paid to mucosal integrity, atrophy, and presence of scars related to childbirth or fissures. Ligamentous integrity of the introitus is noted, and the hymen is examined, palpating for thickness, elasticity or septi. Straining is requested in order to determine the possible paradoxical contraction of the pelvic floor, perineal bulging, and prolapse. Assessment of the pelvic floor should focus on the function, balance, mobility, and integrity of the muscular, fascial, and connective tissue components. Internal palpation allows examination of the bulbospongiosus and ischiocavernosus muscles, as well as puborectalis, pubococcygeus, and iliococcygeus muscles. The pelvic floor muscles, as well as the obturator internus and piriformis, are palpated for tightness and trigger points. The pudendal nerve in Alcock's canal, just inferior to the arcus tendonus, may be checked as well. Pelvic floor muscle strength testing is performed through subjectively assessing the force of contraction felt around the palpating finger, the presence of a perceivable lift of the palpating finger, the number of contractions performed, and the duration of the contractions [61]. In assessing the pelvic floor muscle tone, important markers include muscle length, muscle tension, muscle stiffness, presence of trigger points, and pelvic floor synergy or presence of dysenergia [59].

Physical Therapy Treatment Techniques

Physical therapy treatment of pelvic and genital pain syndromes affecting sexual function has been discussed in the literature [61–63]. Physical therapists provide anatomical information, often using a mirror, to teach patients about their anatomy. They provide suggestions and advice regarding pain management, functional activities to pursue or avoid, and home exercise. They may also suggest behavioral changes such as removal of irritants, use of vaginal dilators, baths, oils, modifications in bicycle seating, and sexual positions. The treatment itself is rehabilitative, and includes manual therapy, pelvic floor muscle normalization, and relaxation with tools such as pelvic floor biofeedback and electrical stimulation. Patients are instructed in various exercises to be performed at home.

Manual Therapy

Various hands-on techniques are applied to treat musculoskeletal abnormalities, postural and skeletal asymmetries, and soft tissue immobility. There are no standard treatment protocols guiding the manual therapy; however, the use and efficacy of manual techniques have been reported in the literature [64–67]. Techniques include trigger point massage, myofascial release, connective and scar tissue release, strain-counterstrain, and visceral manipulation. Muscular trigger points produce pain locally and in a referred pattern, and often accompany chronic musculoskeletal disorders [68]. Passive and resisted stretching is designed to normalize postural imbalances, improve blood circulation in the pelvic and vulvar area, and improve pelvic and vulvar mobility. Manual therapy techniques at the introitus are useful for increasing vaginal entry space and desensitizing areas that are painful to touch.

Exercise

Therapeutic exercises are designed to strengthen weak muscles, stretch tight muscles, improve mobility and flexibility, increase endurance, and decrease pain. When addressing the muscles of the pelvic floor, simple contractile strengthening exercises, popularly referred to as “Kegels,” are insufficient and may actually worsen the symptoms. To be effective, pelvic floor muscle exercises require

proper coordination, timing and synergistic recruitment of other core postural muscles, and the ability to relax. Sexual activity, which requires physical stamina, muscle strength, and mobility, may be hampered by musculoskeletal pain as well as incoordination and instability of the pelvic floor muscles. Patients are instructed in exercises which directly address deficits in motor control, and teach new, functional ways to control and recruit muscles. Men with painful, premature, or delayed ejaculation are instructed in pelvic floor motor control exercises [69]. Pelvic floor exercises for premature or delayed ejaculation have been studied only minimally, and specific exercise protocols have not been established. Exercise instruction varies, and the type of exercise, amount of exercise, and whether the focus is on relaxation, strength, support, or control is determined by the physical findings. These exercises are helpful as well for both men and women with comorbid urogenital symptoms such as bladder urgency and frequency.

Pelvic Floor Biofeedback

Pelvic floor surface electromyography (EMG) biofeedback involves insertion of a probe into the vagina in women, and anus in men, which measures the activity of the pelvic floor muscles and displays it in a graph form on the computer monitor. The muscles are visualized by the patient who is given additional verbal cues in learning to relax, strengthen, stabilize, and coordinate them. The goals of surface EMG biofeedback are to normalize the pelvic floor muscle tone, decrease hypertonus, and improve contractile and resting stability.

Effectiveness of Biofeedback and Physical Therapy: Review of the Literature

Glazer and colleagues demonstrated the findings of increased pelvic floor hypertonus and decreased pelvic floor muscle stability in vulvar pain syndromes, and demonstrated at least 50% effectiveness in reducing VVS pain with pelvic floor biofeedback [70]. Subsequent studies produced similar findings [71,72]. Danielson, comparing EMG biofeedback with topical lidocaine gel, reported that 12/18 (66%) were improved at 12-month follow-up [73]. Biofeedback combined with electrical stimulation in the treatment of 12 vaginismus patients reported that all patients achieved successful sexual intercourse during and

after the treatment [74]. In studies of biofeedback efficacy in the treatment of male pelvic pain, significant reduction in pelvic floor tone and pain improvement was reported by Cornel et al. [72], Clemens et al. [75], and Ye et al. [76].

The effectiveness of physical therapy in treating sexual pain disorders has been reported upon in the literature as well. Retrospective studies have reported on a success rate of 77% [77,78]. Goetsch recently reported her findings that physical therapy may serve as important adjunct to surgery for VVS [79]. The effectiveness of manual physical therapy consisting of pelvic muscle trigger point release on both pain and sexual function outcomes was observed in 146 men with chronic pelvic pain syndrome (CPPS), 92% who presented with associated sexual dysfunction. Overall improvement between 77 and 87% was reported in both pain and sexual function domains [64].

Electrical Stimulation and Other Modalities

Other modalities available to the physiotherapist include pelvic floor electrical stimulation. The use of pelvic floor electrical stimulation has been studied in the treatment of levator ani hypertonus and pelvic pain [80], and has been reported to successfully improve pelvic floor muscle strength and reduce pain in the treatment of VVS [81]. The use of pelvic floor electrical stimulation has been associated with improvement in sexual function as well [82]. The use of perineal ultrasound, the application of deep heat produced by frequency waves for the treatment of dyspareunia [83], and high voltage galvanic stimulation in the treatment of levator ani syndrome [84] have also been reported in the literature.

Although physical therapy is gaining recognition in sexual medicine for its role in decreasing pain and improving sexual function outcomes, controlled studies validating its efficacy have been limited. The challenges cited by physical therapists to publishing outcomes include lack of standardized measures in assessing soft tissue impairment or improvement, difficulty defining the treatment parameters, and difficulty treating by protocol when manual therapy treatment is dynamic and largely governed by feel [85]. Nonetheless, there is a continued need for evidence-based research validating the role of physical therapy in the treatment of pelvic pain and sexual dysfunction.

Facilitation of a Working Relationship among Professionals

Practitioners involved in the treatment of patients with pelvic pain can include the family physician, gastroenterologist, gynecologist, and urologist. Often, mental health professionals including psychologists and sex therapists may be involved. While a complete workup is medically necessary to rule out organic pathology, musculoskeletal involvement appears to be an important component and should be addressed by a physical therapist. Multidisciplinary models imply that physicians treat the medical component, psychologists and sex therapists address the emotional and psychosocial issues, and physical therapists treat muscles. In reality, multidisciplinary treatment is best provided with a "complementary" approach that is achieved through regular communication between the physical therapist and other treating practitioners. Complementary treatment is also best achieved when the practitioners of the various disciplines are knowledgeable and aware of the type and nature of the treatments provided by the other disciplines. Sexual partners are encouraged to attend some or all of the treatments and therapy sessions.

Conclusion

Pelvic pain affects the quality of life, and has a negative impact on sexuality, sexual function, and intimate relationships. Determining the etiology of the pain is medically necessary and validates the mechanisms involved, allowing for appropriate management and treatment. In the absence or presence of organic dysfunction, the musculoskeletal system should be considered, and appropriate treatment provided. Specifically, pelvic floor function should be evaluated, and conditions of abnormal pelvic floor tone should be treated. Although several studies have demonstrated that physical therapy is useful in decreasing pain and sexual symptoms in conditions of CPP, continued investigation is necessary in order to examine the role of the pelvic floor in contributing to sexual dysfunction, to measure successful treatment outcomes, and to validate specific physical therapy interventions in contributing to optimal sexual function.

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Conflict of Interest: None declared.

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